PI.
I.1.1

IMPLEMENTATION

I.1. The faculty demonstrate professional competence and are engaged in any or a combination of the following:

I.1.1. instruction

Documents attached:

- SAMPLE TEACHING ASSIGNMENT
- FACULTY EVALUATION SY 2018-2019, SY 2016-2017

Sample Teaching Assignment

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ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

Polytechnic University of the Philippines
Sta. Mesa, Manila

FACULTY ASSIGNMENT
Second Semester, SY 2018-19

EMP NO	FA0180MN2008	COLLEGE	ENGINEERING
EMP NAME	ADO, REMEDIOS G	DEPT CODE	
EMP STATUS	Permanent	DEPARTMENT	COMPUTER ENGINEERING

DIRECTOR/DEAN

REGULAR LOAD

UBJECT CODE	SUBJECT DESCRIPTION	UNITS	YEAR & SECTION	SUBJ. REF.	TIME	TIME CODE	DAY/S	ROOM	EFFTVTY.
COEN 3291	Computer Seminar and Field Trips	1.5	BSCOE 5-3	C	10:30AM-12PM	3	M	FIELD	11/12/2018
COEN 3473	Computer Technopreneurship	1.5	BSCOE 5-4	C	9AM-10:30AM	2	W	CEA312	11/12/2018

Total REGULAR LOAD 3

PART-TIME

SUBJECT CODE	SUBJECT DESCRIPTION	UNITS	YEAR & SECTION	SUBJ. REF.	TIME	TIME CODE	DAY/S	ROOM	EFFTVTY.
COEN 3291	Computer Seminar and Field Trips	1.5	BSCOE 5-3	C	12PM-1:30PM	4	M	FIELD	11/12/2018
COEN 3473	Computer Technopreneurship	1.5	BSCOE 5-4	C	7:30AM-9AM	1	W	CEA312	11/12/2018
COEN 3253	Design Project 1	3	BSCOE 4-2	C	7:30AM-9AM	1	TF	FIELD	11/12/2016

Total PART-TIME 6

TEACHING LOAD PER DAY (HOURS)

	MON	TUE	WED	THUR	FRI	SAT	SUN
REGULAR	1.50		1.50				
PART-TIME	1.50	1.50	1.50		1.50		
TOTAL	3	1.5	3		1.5		

OFFICIAL TIME / ADVISING TIME

	MON	TUE	WED	THUR	FRI	SAT	SUN
OFFICIAL TIME							
ADVISING TIME							

SUBJECT REFERENCE LEGEND:
(C) - College, (OU) - Open University, (GS) - Graduate School, (PB) - Post Bac, (L) - Law, (T) - iTech

DR. EMANUEL C. DE GUZMAN
President

Polytechnic University of the Philippines
Sta. Mesa, Manila

FACULTY ASSIGNMENT
Second Semester, SY 2018-19

EMP NO	FA0326MN2008	COLLEGE	ENGINEERING
EMP NAME	CANSINO, JULIUS S	DEPT CODE	
EMP STATUS	Permanent	DEPARTMENT	COMPUTER ENGINEERING

CHAIRPERSON

REGULAR LOAD

SUBJECT CODE	SUBJECT DESCRIPTION	UNITS	YEAR & SECTION	SUBJ. REF.	TIME	TIME CODE	DAY/S	ROOM	EFFTVTY.
CMPE 30032	Object-oriented Programming	3	BSCOE 1-2	C	10:30AM-12PM	3	TF	CEA312	11/12/2018
CMPE 30032	Object-oriented Programming	3	BSCOE 1-6	C	9AM-10:30AM	2	TF	CEA312C EA315	11/12/2018

Total REGULAR LOAD 6

PART-TIME

SUBJECT CODE	SUBJECT DESCRIPTION	UNITS	YEAR & SECTION	SUBJ. REF.	TIME	TIME CODE	DAY/S	ROOM	EFFTVTY.
CMPE 30032	Object-oriented Programming	3	BSCOE 1-2	C	12PM-1:30PM	4	TF	CEA312	11/12/2018
CMPE 30032	Object-oriented Programming	3	BSCOE 1-6	C	7:30AM-9AM	1	TF	CEA312C EA315	11/12/2018
COE 622	TECHNOLOGY INFRASTRUCTURE OF INFORMATION SYSTEM	3	1COE622	GS	8AM-11AM	123	S	GSTBA	11/12/2018
COEN 3284	Computer Networks	3	BSCOE 5-2	C	11AM-2PM	345	S	CEA312	11/12/2018

Total PART-TIME 12

TEACHING LOAD PER DAY (HOURS)

	MON	TUE	WED	THUR	FRI	SAT	SUN
REGULAR		3			3		
PART-TIME		3			3	6	
TOTAL		6			6	6	

OFFICIAL TIME / ADVISING TIME

	MON	TUE	WED	THUR	FRI	SAT	SUN
OFFICIAL TIME							
ADVISING TIME							

SUBJECT REFERENCE LEGEND:
(C) - College, (OU) - Open University, (GS) - Graduate School, (PB) - Post Bac, (L) - Law, (T) - iTech

DR. EMANUEL C. DE GUZMAN
President

OVPAA FORM NO. 3
April, 1989

POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
Sta. Mesa, Manila

CHANGES IN TEACHING ASSIGNMENT
Second Semester, School Year 2018-19

EMP NO. : **FA0033MN2017**	COLLEGE : **COLLEGE OF ENGINEERING**
EMP NAME : **DELA CRUZ, ARVIN R**	DEPT CODE :
EMP STATUS : **Part-time**	Department :

FROM				TO						
SUBJECT CODE	SECTION	REM*	AC*	SUBJECT CODE	SECTION	TIME	DAY	ROOM	EFFTVTY	NEW AC*
		A	TS	COEN 3463	BSCOE 5-2	09:00AM-12:00PM/12:00PM-02:00PM	M	CEA314	11.12.2018 up to 03.30.2019	
		A	TS	COEN 3463	BSCOE 5-4	03:00PM-05:00PM/05:00PM-08:00PM	F	CEA300	11.12.2018 up to 03.30.2019	
		A	TS	BSCOE-ELEC4	BSCOE 5-3	06:00PM-09:00PM	M	CEA314	11.12.2018 up to 03.30.2019	
		A	TS	ENSC 2192	BSIE 4-3	03:00PM-06:00PM/06:00PM-09:00PM	W	CEA313	11.12.2018 up to 03.30.2019	
		A	TS	COE 620	1COE620	06:00PM-09:00PM	S	GSTBA	11.12.2018 up to 03.30.2019	
		A	TS	CM 657	MSCM-LOC 1-3B	05:30PM-08:30PM	SUN	OUMN8	11.18.2018 up to 03.31.2019	
		A	TS	CM 660	MSCM-LOC 1-3A	02:30PM-05:30PM	SUN	OUMN8	11.18.2018 up to 03.31.2019	
		A	TS	COEN 3253	BSCOEPQ 4-1	06:00PM-09:00PM	TH	PQ202	11.12.2018 up to 03.30.2019	
		A	TS	COEN 3463	BSCOEPQ 5-1	08:00AM-10:00AM/10:00AM-01:00PM	T	PQ201	11.12.2018 up to 03.30.2019	

Reason(s) for change(s)

NOTE: * REM: C (Cancelled) A (Added) CH (Changed)
**** AC or Assignment Code:** R (Regular) P (Part-time) TS (T. Substi.) T (Tutorial)

SUMMARY

ORIGINAL LOAD				NEW LOAD		
Regular Load	-	hrs.		Regular Load	0	hrs.
Part-time Load	12	hrs.		Part-time Load	12	hrs.
Tempt. Substi. Load	-	hrs.	+27	Tempt. Substi. Load	27	hrs.
PUP-GS/OU	-	hrs.	+9	PUP-GS/OU	9	hrs.
Tutorial	-	hrs.		Tutorial	-	hrs.
TOTAL	12	hrs.		**TOTAL**	48	hrs.

Recommending Approval :

REMEDIOS G ADO
Dean/Chairperson

Approval :

DR. EMANUEL C. DE GUZMAN
President

Faculty Evaluation
SY 2018-2019

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Faculty Online Evaluation
SUMMARY OF RESULTS
Second Semester S.Y. 1819

COLLEGE OF ENGINEERING — **Over-all Rating** 84.8581 — **Interpretation** VERY SATISFACTORY

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
1	ADO, REMEDIOS G.	96.8000	OUTSTANDING	100.0000	OUTSTANDING	92.4188	OUTSTANDING	99.2000	OUTSTANDING	94.0532	OUTSTANDING
2	ARTIFICIO, EDCEL	81.6000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	81.8126	VERY SATISFACTORY	87.2000	VERY SATISFACTORY	81.5888	VERY SATISFACTORY
3	CABRERA, KEVIN MICHAEL A.	81.6000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	81.3358	VERY SATISFACTORY	No Evaluation		81.2551	VERY SATISFACTORY
4	CANLAS, ARLENE B.	92.0000	OUTSTANDING	88.8000	VERY SATISFACTORY	88.1256	VERY SATISFACTORY	100.0000	OUTSTANDING	88.9679	VERY SATISFACTORY
5	CANSINO, JULIUS S	100.0000	OUTSTANDING	No Evaluation		78.1638	VERY SATISFACTORY	100.0000	OUTSTANDING	74.7147	VERY SATISFACTORY
6	CHIN, FRANK ANTHONY	80.0000	VERY SATISFACTORY	71.2000	VERY SATISFACTORY	81.9528	VERY SATISFACTORY	99.2000	OUTSTANDING	80.4870	VERY SATISFACTORY
7	DE LA CRUZ, ARVIN	94.0000	OUTSTANDING	99.2000	OUTSTANDING	86.7844	VERY SATISFACTORY	100.0000	OUTSTANDING	89.4691	VERY SATISFACTORY
8	DELA CRUZ, JOHN	93.2000	OUTSTANDING	95.6000	OUTSTANDING	82.8416	VERY SATISFACTORY	100.0000	OUTSTANDING	86.1891	VERY SATISFACTORY
9	FERNANDO, RONALD D	100.0000	OUTSTANDING	100.0000	OUTSTANDING	81.8126	VERY SATISFACTORY	100.0000	OUTSTANDING	87.2688	VERY SATISFACTORY
10	KHAN, MA. LEONA	77.6000	VERY SATISFACTORY	77.6000	VERY SATISFACTORY	75.1258	VERY SATISFACTORY	No Evaluation		75.8681	VERY SATISFACTORY
11	LEGARDA, MARY ANN VILLA	86.8000	VERY SATISFACTORY	75.6000	VERY SATISFACTORY	64.4602	SATISFACTORY	99.2000	OUTSTANDING	70.0421	SATISFACTORY
12	LORICO, JULIAN L.	92.0000	OUTSTANDING	92.8000	OUTSTANDING	77.9552	VERY SATISFACTORY	100.0000	OUTSTANDING	82.2486	VERY SATISFACTORY
13	MADRIGALEJOS, DANILO JR. C.	82.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	91.3764	OUTSTANDING	No Evaluation		88.3635	VERY SATISFACTORY
14	MAHAGUAY, ROLITO LACEDA	100.0000	OUTSTANDING	100.0000	OUTSTANDING	92.5694	OUTSTANDING	100.0000	OUTSTANDING	94.7986	OUTSTANDING
15	NATIVIDAD, FERDINAND O	100.0000	OUTSTANDING	100.0000	OUTSTANDING	79.9004	VERY SATISFACTORY	100.0000	OUTSTANDING	85.9303	VERY SATISFACTORY
16	NATIVIDAD, MARK KERVIN	100.0000	OUTSTANDING	94.0000	OUTSTANDING	89.4376	VERY SATISFACTORY	100.0000	OUTSTANDING	92.0063	OUTSTANDING
17	OQUINDO, FLORINDA H	100.0000	OUTSTANDING	100.0000	OUTSTANDING	83.8172	VERY SATISFACTORY	98.8000	OUTSTANDING	88.6720	VERY SATISFACTORY
18	PAJABERA, ORLANDO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	90.4034	VERY SATISFACTORY	98.4000	OUTSTANDING	93.2824	OUTSTANDING

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Faculty Online Evaluation
SUMMARY OF RESULTS
Second Semester S.Y. 1819

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
19	REYES, LUTZER UGTO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	94.6384	OUTSTANDING	100.0000	OUTSTANDING	96.2469	OUTSTANDING
20	RODRIGUEZ, JOSHUA BENJAMIN	100.0000	OUTSTANDING	100.0000	OUTSTANDING	87.7486	VERY SATISFACTORY	100.0000	OUTSTANDING	91.4240	OUTSTANDING
21	SUNGA, BOB MATHEW	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	79.8984	VERY SATISFACTORY	No Evaluation		79.9289	VERY SATISFACTORY
22	TENERIFE JR, PEDRITO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	90.5604	VERY SATISFACTORY	100.0000	OUTSTANDING	93.3923	OUTSTANDING
23	TRIA, ROMAN ANGELO CARPIO	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	79.2852	VERY SATISFACTORY	88.8000	VERY SATISFACTORY	79.4996	VERY SATISFACTORY
24	VELASCO, ANTONIO Y.	96.0000	OUTSTANDING	100.0000	OUTSTANDING	77.74	VERY SATISFACTORY	100.0000	OUTSTANDING	83.6180	VERY SATISFACTORY
25	VERZO, ALLAN	90.0000	VERY SATISFACTORY	63.2000	SATISFACTORY	54.0234	SATISFACTORY	94.8000	OUTSTANDING	62.1364	SATISFACTORY

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Faculty Online Evaluation
SUMMARY OF RESULTS
First Semester S.Y. 1819

COLLEGE OF ENGINEERING

Over-all Rating 85.7082 **Interpretation** VERY SATISFACTORY

	Name of Faculty	Supervisor Evaluator 1 Rating	Supervisor Evaluator 1 Interpretation	Supervisor Evaluator 2 Rating	Supervisor Evaluator 2 Interpretation	Student Evaluation Rating	Student Evaluation Interpretation	Self Evaluation Rating	Self Evaluation Interpretation	Over-all Evaluation Rating	Over-all Evaluation Interpretation
1	ADO, REMEDIOS G.	94.0000	OUTSTANDING	100.0000	OUTSTANDING	84.881	VERY SATISFACTORY	92.0000	OUTSTANDING	88.2167	VERY SATISFACTORY
2	ARTIFICIO, EDCEL	92.0000	OUTSTANDING	75.2000	VERY SATISFACTORY	76.434	VERY SATISFACTORY	77.6000	VERY SATISFACTORY	79.4238	VERY SATISFACTORY
3	CANLAS, ARLENE B.	92.0000	OUTSTANDING	88.4000	VERY SATISFACTORY	72.491	VERY SATISFACTORY	100.0000	OUTSTANDING	77.9837	VERY SATISFACTORY
4	CANSINO, JULIUS S	100.0000	OUTSTANDING	No Evaluation		81.5388	VERY SATISFACTORY	100.0000	OUTSTANDING	87.0772	VERY SATISFACTORY
5	CHIN, FRANK ANTHONY	91.2000	OUTSTANDING	80.0000	VERY SATISFACTORY	67.6238	SATISFACTORY	100.0000	OUTSTANDING	73.5767	VERY SATISFACTORY
6	DE LA CRUZ, ARVIN	100.0000	OUTSTANDING	100.0000	OUTSTANDING	86.4334	VERY SATISFACTORY	100.0000	OUTSTANDING	90.5034	VERY SATISFACTORY
7	DELA CRUZ, JOHN	94.8000	OUTSTANDING	100.0000	OUTSTANDING	83.2676	VERY SATISFACTORY	100.0000	OUTSTANDING	87.2473	VERY SATISFACTORY
8	DELOS REYES, NORMAN DAVID FARISCAL	92.0000	OUTSTANDING	86.4000	VERY SATISFACTORY	69.6626	SATISFACTORY	100.0000	OUTSTANDING	75.8038	VERY SATISFACTORY
9	FERNANDO, RONALD D	98.0000	OUTSTANDING	100.0000	OUTSTANDING	82.2072	VERY SATISFACTORY	100.0000	OUTSTANDING	87.1450	VERY SATISFACTORY
10	KHAN, MA. LEONA	92.0000	OUTSTANDING	75.2000	VERY SATISFACTORY	73.9648	VERY SATISFACTORY	90.4000	VERY SATISFACTORY	77.6954	VERY SATISFACTORY
11	LEGARDA, MARY ANN VILLA	91.2000	OUTSTANDING	87.6000	VERY SATISFACTORY	72.4466	VERY SATISFACTORY	100.0000	OUTSTANDING	77.7126	VERY SATISFACTORY
12	LORICO, JULIAN L.	94.8000	OUTSTANDING	100.0000	OUTSTANDING	81.7196	VERY SATISFACTORY	100.0000	OUTSTANDING	86.1637	VERY SATISFACTORY
13	MADRIGALEJOS, DANILO JR. C.	93.2000	OUTSTANDING	88.8000	VERY SATISFACTORY	88.6706	VERY SATISFACTORY	99.2000	OUTSTANDING	89.5894	VERY SATISFACTORY
14	MAHAGUAY, ROLITO LACEDA	100.0000	OUTSTANDING	100.0000	OUTSTANDING	91.8212	OUTSTANDING	100.0000	OUTSTANDING	94.2748	OUTSTANDING
15	NATIVIDAD, FERDINAND O	94.8000	OUTSTANDING	100.0000	OUTSTANDING	74.9954	VERY SATISFACTORY	100.0000	OUTSTANDING	81.4568	VERY SATISFACTORY
16	NATIVIDAD, MARK KERVIN	94.0000	OUTSTANDING	88.8000	VERY SATISFACTORY	90.8962	VERY SATISFACTORY	100.0000	OUTSTANDING	91.3073	OUTSTANDING
17	OQUINDO, FLORINDA H	100.0000	OUTSTANDING	100.0000	OUTSTANDING	80.5744	VERY SATISFACTORY	92.0000	OUTSTANDING	86.4021	VERY SATISFACTORY

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Faculty Online Evaluation
SUMMARY OF RESULTS
First Semester S.Y. 1819

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
18	PAJABERA, ORLANDO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	88.9388	VERY SATISFACTORY	96.0000	OUTSTANDING	92.2572	OUTSTANDING
19	REYES, LUTZER UGTO	98.0000	OUTSTANDING	100.0000	OUTSTANDING	92.113	OUTSTANDING	100.0000	OUTSTANDING	94.0791	OUTSTANDING
20	RODRIGUEZ, JOSHUA BENJAMIN	97.2000	OUTSTANDING	100.0000	OUTSTANDING	85.2712	VERY SATISFACTORY	100.0000	OUTSTANDING	89.1298	VERY SATISFACTORY
21	SAWI, CHRISTOPHER M.	94.0000	OUTSTANDING	89.6000	VERY SATISFACTORY	91.1376	OUTSTANDING	100.0000	OUTSTANDING	91.5563	OUTSTANDING
22	SUNGA, BOB MATHEW	94.0000	OUTSTANDING	80.0000	VERY SATISFACTORY	94.4314	OUTSTANDING	No Evaluation		92.9020	OUTSTANDING
23	TENERIFE JR, PEDRITO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	83.3844	VERY SATISFACTORY	100.0000	OUTSTANDING	88.3691	VERY SATISFACTORY
24	TRIA, ROMAN ANGELO CARPIO	94.0000	OUTSTANDING	90.0000	VERY SATISFACTORY	87.9336	VERY SATISFACTORY	83.2000	VERY SATISFACTORY	89.3535	VERY SATISFACTORY
25	VELASCO, ANTONIO Y.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	72.6726	VERY SATISFACTORY	100.0000	OUTSTANDING	80.8708	VERY SATISFACTORY
26	VERZO, ALLAN	91.2000	OUTSTANDING	78.0000	VERY SATISFACTORY	74.6778	VERY SATISFACTORY	96.4000	OUTSTANDING	78.3145	VERY SATISFACTORY

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Faculty Evaluation

SY 2017-2018

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Faculty Online Evaluation
SUMMARY OF RESULTS
Second Semester S.Y. 1718

COLLEGE OF ENGINEERING

Over-all Rating 82.0481 **Interpretation** VERY SATISFACTORY

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
1	ADO, REMEDIOS G.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	91.038	OUTSTANDING	99.2000	OUTSTANDING	93.7266	OUTSTANDING
2	ARTIFICIO, EDCEL	100.0000	OUTSTANDING	88.0000	VERY SATISFACTORY	90.3662	VERY SATISFACTORY	91.6000	OUTSTANDING	92.0563	OUTSTANDING
3	CABRERA, KEVIN MICHAEL A.	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	78.27	VERY SATISFACTORY	100.0000	OUTSTANDING	78.7890	VERY SATISFACTORY
4	CANLAS, ARLENE B.	80.0000	VERY SATISFACTORY	100.0000	OUTSTANDING	70.9544	SATISFACTORY	100.0000	OUTSTANDING	75.6681	VERY SATISFACTORY
5	CANSINO, JULIUS S	100.0000	OUTSTANDING	No Evaluation		78.99	VERY SATISFACTORY	100.0000	OUTSTANDING	85.2930	VERY SATISFACTORY
6	CHIN, FRANK ANTHONY	80.0000	VERY SATISFACTORY	89.6000	VERY SATISFACTORY	79.473	VERY SATISFACTORY	99.2000	OUTSTANDING	80.5911	VERY SATISFACTORY
7	DE LA CRUZ, ARVIN	92.8000	OUTSTANDING	100.0000	OUTSTANDING	86.6644	VERY SATISFACTORY	100.0000	OUTSTANDING	89.2251	VERY SATISFACTORY
8	DELA CRUZ, JOHN	No Evaluation		No Evaluation		89.4924	VERY SATISFACTORY	96.0000	OUTSTANDING	62.6447	SATISFACTORY
9	DELOS REYES, NORMAN DAVID FARISCAL	80.0000	VERY SATISFACTORY	84.8000	VERY SATISFACTORY	70.4004	SATISFACTORY	88.0000	VERY SATISFACTORY	73.7603	VERY SATISFACTORY
10	FERNANDO, RONALD D	88.0000	VERY SATISFACTORY	100.0000	OUTSTANDING	94.0466	OUTSTANDING	100.0000	OUTSTANDING	93.4326	OUTSTANDING
11	KHAN, MA. LEONA	80.0000	VERY SATISFACTORY	78.4000	VERY SATISFACTORY	69.4284	SATISFACTORY	No Evaluation		72.4399	VERY SATISFACTORY
12	LEGARDA, MARY ANN VILLA	80.0000	VERY SATISFACTORY	79.2000	VERY SATISFACTORY	58.21	SATISFACTORY	No Evaluation		64.6670	SATISFACTORY
13	LORICO, JULIAN L.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	82.152	VERY SATISFACTORY	100.0000	OUTSTANDING	87.5064	VERY SATISFACTORY
14	MADRIGALEJOS, DANILO JR. C.	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	83.417	VERY SATISFACTORY	No Evaluation		82.3919	VERY SATISFACTORY
15	MAHAGUAY, ROLITO LACEDA	100.0000	OUTSTANDING	100.0000	OUTSTANDING	92.8298	OUTSTANDING	100.0000	OUTSTANDING	94.9809	OUTSTANDING
16	MANALO, RICO M.	60.0000	SATISFACTORY	71.6000	VERY SATISFACTORY	70.759	SATISFACTORY	100.0000	OUTSTANDING	68.6913	SATISFACTORY
17	NATIVIDAD, FERDINAND O	100.0000	OUTSTANDING	100.0000	OUTSTANDING	74.836	VERY SATISFACTORY	100.0000	OUTSTANDING	82.3852	VERY SATISFACTORY
18	NATIVIDAD, MARK KERVIN	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	86.9062	VERY SATISFACTORY	100.0000	OUTSTANDING	84.8343	VERY SATISFACTORY

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Faculty Online Evaluation
SUMMARY OF RESULTS
Second Semester S.Y. 1718

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
19	OQUINDO, FLORINDA H	100.0000	OUTSTANDING	100.0000	OUTSTANDING	76.8968	VERY SATISFACTORY	100.0000	OUTSTANDING	83.8278	VERY SATISFACTORY
20	PAJABERA, ORLANDO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	89.9204	VERY SATISFACTORY	98.4000	OUTSTANDING	92.9443	OUTSTANDING
21	PANGILINAN, KERUBIN	60.0000	SATISFACTORY	67.2000	SATISFACTORY	71.9958	VERY SATISFACTORY	85.6000	VERY SATISFACTORY	69.1171	SATISFACTORY
22	REYES, LUTZER UGTO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	92.3382	OUTSTANDING	100.0000	OUTSTANDING	94.6367	OUTSTANDING
23	RODRIGUEZ, JOSHUA BENJAMIN	100.0000	OUTSTANDING	100.0000	OUTSTANDING	89.366	VERY SATISFACTORY	100.0000	OUTSTANDING	92.5562	OUTSTANDING
24	SAWI, CHRISTOPHER M.	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	92.8966	OUTSTANDING	100.0000	OUTSTANDING	89.0276	VERY SATISFACTORY
25	SERVIANO, AZDIE	60.0000	SATISFACTORY	65.6000	SATISFACTORY	69.1738	SATISFACTORY	60.0000	SATISFACTORY	66.9817	SATISFACTORY
26	TENERIFE JR, PEDRITO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	88.2376	VERY SATISFACTORY	100.0000	OUTSTANDING	91.7663	OUTSTANDING
27	TRIA, ROMAN ANGELO CARPIO	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	90.0558	VERY SATISFACTORY	80.4000	VERY SATISFACTORY	87.0391	VERY SATISFACTORY
28	VELASCO, ANTONIO Y.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	78.1446	VERY SATISFACTORY	100.0000	OUTSTANDING	84.7012	VERY SATISFACTORY
29	VERZO, ALLAN	60.0000	SATISFACTORY	78.4000	VERY SATISFACTORY	62.6746	SATISFACTORY	100.0000	OUTSTANDING	63.7122	SATISFACTORY

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Faculty Online Evaluation
SUMMARY OF RESULTS
First Semester S.Y. 1718

COLLEGE OF ENGINEERING

Over-all Rating 80.7489 **Interpretation** VERY SATISFACTORY

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
1	ADO, REMEDIOS G.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	96.0716	OUTSTANDING	98.4000	OUTSTANDING	97.2501	OUTSTANDING
2	ARTIFICIO, EDCEL	79.2000	VERY SATISFACTORY	91.2000	OUTSTANDING	90.4918	VERY SATISFACTORY	91.6000	OUTSTANDING	88.3043	VERY SATISFACTORY
3	CABRERA, KEVIN MICHAEL A.	79.2000	VERY SATISFACTORY	84.0000	VERY SATISFACTORY	80.219	VERY SATISFACTORY	96.8000	OUTSTANDING	80.3933	VERY SATISFACTORY
4	CANLAS, ARLENE B.	80.0000	VERY SATISFACTORY	100.0000	OUTSTANDING	78.4648	VERY SATISFACTORY	100.0000	OUTSTANDING	80.9254	VERY SATISFACTORY
5	CANSINO, JULIUS S	100.0000	OUTSTANDING	No Evaluation		69.6612	SATISFACTORY	100.0000	OUTSTANDING	78.7628	VERY SATISFACTORY
6	CECOGO, JOHN VINCENT	80.0000	VERY SATISFACTORY	90.4000	VERY SATISFACTORY	74.05	VERY SATISFACTORY	71.2000	VERY SATISFACTORY	76.8750	VERY SATISFACTORY
7	DE LA CRUZ, ARVIN	No Evaluation		No Evaluation		84.7498	VERY SATISFACTORY	100.0000	OUTSTANDING	59.3249	SATISFACTORY
8	DELOS REYES, NORMAN DAVID FARISCAL	79.2000	VERY SATISFACTORY	91.6000	OUTSTANDING	61.9294	SATISFACTORY	81.2000	VERY SATISFACTORY	68.3506	SATISFACTORY
9	FERNANDO, RONALD D	100.0000	OUTSTANDING	100.0000	OUTSTANDING	92.1688	OUTSTANDING	99.2000	OUTSTANDING	94.5182	OUTSTANDING
10	KHAN, MA. LEONA	78.4000	VERY SATISFACTORY	78.4000	VERY SATISFACTORY	54.3372	SATISFACTORY	80.8000	VERY SATISFACTORY	61.5560	SATISFACTORY
11	LEGARDA, MARY ANN VILLA	75.2000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	66.1772	SATISFACTORY	99.2000	OUTSTANDING	69.3640	SATISFACTORY
12	LIGAYO, MICHAEL ANGELO D.	78.4000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	86.8736	VERY SATISFACTORY	No Evaluation		84.4915	VERY SATISFACTORY
13	LORICO, JULIAN L.	80.0000	VERY SATISFACTORY	100.0000	OUTSTANDING	83.3342	VERY SATISFACTORY	100.0000	OUTSTANDING	84.3339	VERY SATISFACTORY
14	MADRIGALEJOS, DANILO JR. C.	80.0000	VERY SATISFACTORY	87.6000	VERY SATISFACTORY	85.6142	VERY SATISFACTORY	97.6000	OUTSTANDING	84.6899	VERY SATISFACTORY
15	MAHAGUAY, ROLITO LACEDA	100.0000	OUTSTANDING	100.0000	OUTSTANDING	89.7482	VERY SATISFACTORY	100.0000	OUTSTANDING	92.8237	OUTSTANDING
16	MANALO, RICO M.	78.4000	VERY SATISFACTORY	84.0000	VERY SATISFACTORY	68.924	SATISFACTORY	100.0000	OUTSTANDING	72.3268	VERY SATISFACTORY
17	NATIVIDAD, FERDINAND O	80.0000	VERY SATISFACTORY	100.0000	OUTSTANDING	73.7794	VERY SATISFACTORY	100.0000	OUTSTANDING	77.6456	VERY SATISFACTORY
18	NATIVIDAD, MARK KERVIN	80.0000	VERY SATISFACTORY	100.0000	OUTSTANDING	85.681	VERY SATISFACTORY	100.0000	OUTSTANDING	85.9767	VERY SATISFACTORY

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Faculty Online Evaluation
SUMMARY OF RESULTS
First Semester S.Y. 1718

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
19	OQUINDO, FLORINDA H	100.0000	OUTSTANDING	100.0000	OUTSTANDING	81.6212	VERY SATISFACTORY	99.2000	OUTSTANDING	87.1348	VERY SATISFACTOR
20	PAJABERA, ORLANDO	80.0000	VERY SATISFACTORY	100.0000	OUTSTANDING	88.9086	VERY SATISFACTORY	98.4000	OUTSTANDING	88.2360	VERY SATISFACTOR
21	PANGILINAN, KERUBIN	78.4000	VERY SATISFACTORY	83.6000	VERY SATISFACTORY	71.5824	VERY SATISFACTORY	92.8000	OUTSTANDING	74.1477	VERY SATISFACTOR
22	REYES, LUTZER UGTO	80.0000	VERY SATISFACTORY	100.0000	OUTSTANDING	89.3976	VERY SATISFACTORY	100.0000	OUTSTANDING	88.5783	VERY SATISFACTOR
23	RODRIGUEZ, JOSHUA BENJAMIN	100.0000	OUTSTANDING	100.0000	OUTSTANDING	89.2252	VERY SATISFACTORY	100.0000	OUTSTANDING	92.4576	OUTSTANDING
24	SAWI, CHRISTOPHER M.	80.0000	VERY SATISFACTORY	95.6000	OUTSTANDING	94.673	OUTSTANDING	100.0000	OUTSTANDING	91.8311	OUTSTANDING
25	SERVIANO, AZDIE	78.4000	VERY SATISFACTORY	84.0000	VERY SATISFACTORY	68.096	SATISFACTORY	83.6000	VERY SATISFACTORY	71.7472	VERY SATISFACTOR
26	TENERIFE JR, PEDRITO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	88.3148	VERY SATISFACTORY	100.0000	OUTSTANDING	91.8204	OUTSTANDING
27	VELASCO, ANTONIO Y.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	71.0254	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	79.7178	VERY SATISFACTOR
28	VERZO, ALLAN	70.4000	SATISFACTORY	80.0000	VERY SATISFACTORY	50.436	FAIR	100.0000	OUTSTANDING	57.3852	SATISFACTOR

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Faculty Online Evaluation
SUMMARY OF RESULTS
Second Semester S.Y. 1617

COLLEGE OF ENGINEERING

Over-all Rating 78.9293 **Interpretation** VERY SATISFACTORY

		Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
	Name of Faculty	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
1	ADO, REMEDIOS G.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	92.1066	OUTSTANDING	100.0000	OUTSTANDING	94.4746	OUTSTANDING
2	ARTIFICIO, EDCEL	100.0000	OUTSTANDING	80.0000	VERY SATISFACTORY	76.9848	VERY SATISFACTORY	80.8000	VERY SATISFACTORY	81.8894	VERY SATISFACTORY
3	CABRERA, KEVIN MICHAEL A.	86.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	75.3856	VERY SATISFACTORY	100.0000	OUTSTANDING	77.9699	VERY SATISFACTORY
4	CANLAS, ARLENE B.	91.6000	OUTSTANDING	90.0000	VERY SATISFACTORY	78.2158	VERY SATISFACTORY	100.0000	OUTSTANDING	82.0711	VERY SATISFACTORY
5	CANSINO, JULIUS S	98.4000	OUTSTANDING	No Evaluation		76.4488	VERY SATISFACTORY	100.0000	OUTSTANDING	73.1942	VERY SATISFACTORY
6	CATRIZ JR., ELORDE S	80.0000	VERY SATISFACTORY	72.4000	VERY SATISFACTORY	82.0188	VERY SATISFACTORY	73.2000	VERY SATISFACTORY	80.6532	VERY SATISFACTORY
7	CECOGO, JOHN VINCENT	86.4000	VERY SATISFACTORY	78.4000	VERY SATISFACTORY	73.5548	VERY SATISFACTORY	63.2000	SATISFACTORY	76.6084	VERY SATISFACTORY
8	CHIN, FRANK ANTHONY	80.0000	VERY SATISFACTORY	No Evaluation		74.3048	VERY SATISFACTORY	No Evaluation		68.0134	SATISFACTORY
9	DELOS REYES, NORMAN DAVID FARISCAL	80.0000	VERY SATISFACTORY	74.4000	VERY SATISFACTORY	49.55	FAIR	82.4000	VERY SATISFACTORY	58.1250	SATISFACTORY
10	FERNANDO, RONALD D	88.8000	VERY SATISFACTORY	100.0000	OUTSTANDING	86.4672	VERY SATISFACTORY	100.0000	OUTSTANDING	88.2870	VERY SATISFACTORY
11	KHAN, MA. LEONA	61.6000	SATISFACTORY	58.4000	SATISFACTORY	57.4742	SATISFACTORY	56.4000	SATISFACTORY	58.3919	SATISFACTORY
12	LEGARDA, MARY ANN VILLA	80.0000	VERY SATISFACTORY	74.4000	VERY SATISFACTORY	55.7792	SATISFACTORY	No Evaluation		62.4854	SATISFACTORY
13	LIGAYO, MICHAEL ANGELO D.	80.0000	VERY SATISFACTORY	74.0000	VERY SATISFACTORY	88.293	VERY SATISFACTORY	84.0000	VERY SATISFACTORY	85.2051	VERY SATISFACTORY
14	LORICO, JULIAN L.	96.4000	OUTSTANDING	80.8000	VERY SATISFACTORY	87.4786	VERY SATISFACTORY	100.0000	OUTSTANDING	88.5950	VERY SATISFACTORY
15	MADRIGALEJOS, DANILO JR. C.	80.0000	VERY SATISFACTORY	79.2000	VERY SATISFACTORY	89.7008	VERY SATISFACTORY	96.0000	OUTSTANDING	86.7106	VERY SATISFACTORY
16	MAHAGUAY, ROLITO LACEDA	100.0000	OUTSTANDING	96.0000	OUTSTANDING	90.781	VERY SATISFACTORY	100.0000	OUTSTANDING	93.1467	OUTSTANDING
17	MAIGUE, CHENNE	80.0000	VERY SATISFACTORY	72.8000	VERY SATISFACTORY	78.7528	VERY SATISFACTORY	95.2000	OUTSTANDING	78.4070	VERY SATISFACTORY
18	MANALO, RICO M.	80.0000	VERY SATISFACTORY	76.0000	VERY SATISFACTORY	64.6054	SATISFACTORY	No Evaluation		68.8238	SATISFACTORY

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Faculty Online Evaluation
SUMMARY OF RESULTS
Second Semester S.Y. 1617

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
19	NATIVIDAD, FERDINAND O	100.0000	OUTSTANDING	84.0000	VERY SATISFACTORY	76.1296	VERY SATISFACTORY	100.0000	OUTSTANDING	81.6907	VERY SATISFACTORY
20	NATIVIDAD, MARK KERVIN	91.2000	OUTSTANDING	76.4000	VERY SATISFACTORY	75.3286	VERY SATISFACTORY	100.0000	OUTSTANDING	78.6100	VERY SATISFACTORY
21	OQUINDO, FLORINDA H	100.0000	OUTSTANDING	97.6000	OUTSTANDING	80.204	VERY SATISFACTORY	93.6000	OUTSTANDING	85.9028	VERY SATISFACTORY
22	PAJABERA, ORLANDO	100.0000	OUTSTANDING	83.2000	VERY SATISFACTORY	85.5762	VERY SATISFACTORY	97.6000	OUTSTANDING	88.2233	VERY SATISFACTORY
23	PANGILINAN, KERUBIN	78.4000	VERY SATISFACTORY	69.2000	SATISFACTORY	77.0722	VERY SATISFACTORY	86.0000	VERY SATISFACTORY	76.5505	VERY SATISFACTORY
24	PILUETA, NIÑO U.	93.2000	OUTSTANDING	80.0000	VERY SATISFACTORY	72.3994	VERY SATISFACTORY	100.0000	OUTSTANDING	77.3196	VERY SATISFACTORY
25	REYES, LUTZER UGTO	94.0000	OUTSTANDING	94.0000	OUTSTANDING	93.2062	OUTSTANDING	100.0000	OUTSTANDING	93.4443	OUTSTANDING
26	RODRIGUEZ, JOSHUA BENJAMIN	100.0000	OUTSTANDING	84.8000	VERY SATISFACTORY	86.6306	VERY SATISFACTORY	100.0000	OUTSTANDING	89.1214	VERY SATISFACTORY
27	SAWI, CHRISTOPHER M.	91.6000	OUTSTANDING	80.0000	VERY SATISFACTORY	91.4552	OUTSTANDING	100.0000	OUTSTANDING	90.3386	VERY SATISFACTORY
28	SERVIANO, AZDIE	78.4000	VERY SATISFACTORY	70.8000	SATISFACTORY	68.941	SATISFACTORY	69.2000	SATISFACTORY	71.0187	VERY SATISFACTORY
29	TENERIFE JR, PEDRITO	100.0000	OUTSTANDING	96.4000	OUTSTANDING	85.3782	VERY SATISFACTORY	100.0000	OUTSTANDING	89.4047	VERY SATISFACTORY
30	TRIA, ROMAN ANGELO CARPIO	80.0000	VERY SATISFACTORY	82.4000	VERY SATISFACTORY	92.4912	OUTSTANDING	71.2000	VERY SATISFACTORY	88.9838	VERY SATISFACTORY
31	VALENTINO, JIMMAR	No Evaluation		No Evaluation		74.7632	VERY SATISFACTORY	84.4000	VERY SATISFACTORY	52.3342	SATISFACTORY
32	VELASCO, ANTONIO Y.	100.0000	OUTSTANDING	91.2000	OUTSTANDING	76.2128	VERY SATISFACTORY	100.0000	OUTSTANDING	82.4690	VERY SATISFACTORY
33	VERZO, ALLAN	60.0000	SATISFACTORY	56.8000	SATISFACTORY	55.034	SATISFACTORY	100.0000	OUTSTANDING	56.2038	SATISFACTORY

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Faculty Online Evaluation
SUMMARY OF RESULTS
First Semester S.Y. 1617

COLLEGE OF ENGINEERING

Over-all Rating 81.3897 **Interpretation** VERY SATISFACTORY

	Name of Faculty	Supervisor Evaluator 1 Rating	Supervisor Evaluator 1 Interpretation	Supervisor Evaluator 2 Rating	Supervisor Evaluator 2 Interpretation	Student Evaluation Rating	Student Evaluation Interpretation	Self Evaluation Rating	Self Evaluation Interpretation	Over-all Evaluation Rating	Over-all Evaluation Interpretation
1	ADO, REMEDIOS G.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	91.3586	OUTSTANDING	99.2000	OUTSTANDING	93.9510	OUTSTANDING
2	ARTIFICIO, EDCEL	83.6000	VERY SATISFACTORY	84.4000	VERY SATISFACTORY	65.7012	SATISFACTORY	94.0000	OUTSTANDING	71.1508	VERY SATISFACTORY
3	CABRERA, KEVIN MICHAEL A.	84.8000	VERY SATISFACTORY	83.6000	VERY SATISFACTORY	75.3318	VERY SATISFACTORY	100.0000	OUTSTANDING	78.0523	VERY SATISFACTORY
4	CANLAS, ARLENE B.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	86.1474	VERY SATISFACTORY	100.0000	OUTSTANDING	90.3032	VERY SATISFACTORY
5	CANSINO, JULIUS S	100.0000	OUTSTANDING	100.0000	OUTSTANDING	81.5926	VERY SATISFACTORY	100.0000	OUTSTANDING	87.1148	VERY SATISFACTORY
6	CATRIZ JR., ELORDE S	89.6000	VERY SATISFACTORY	82.8000	VERY SATISFACTORY	82.9372	VERY SATISFACTORY	73.6000	VERY SATISFACTORY	84.2560	VERY SATISFACTORY
7	CECOGO, JOHN VINCENT	92.8000	OUTSTANDING	84.8000	VERY SATISFACTORY	88.429	VERY SATISFACTORY	72.0000	VERY SATISFACTORY	88.9403	VERY SATISFACTORY
8	DELOS REYES, NORMAN DAVID FARISCAL	82.0000	VERY SATISFACTORY	82.8000	VERY SATISFACTORY	65.015	SATISFACTORY	83.6000	VERY SATISFACTORY	70.1905	SATISFACTORY
9	FERNANDO, RONALD D	100.0000	OUTSTANDING	100.0000	OUTSTANDING	83.631	VERY SATISFACTORY	100.0000	OUTSTANDING	88.5417	VERY SATISFACTORY
10	KHAN, MA. LEONA	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	78.639	VERY SATISFACTORY	96.0000	OUTSTANDING	79.0473	VERY SATISFACTORY
11	LEGARDA, MARY ANN VILLA	78.4000	VERY SATISFACTORY	78.4000	VERY SATISFACTORY	70.6914	SATISFACTORY	100.0000	OUTSTANDING	73.0040	VERY SATISFACTORY
12	LIGAYO, MICHAEL ANGELO D.	83.6000	VERY SATISFACTORY	83.6000	VERY SATISFACTORY	80.0904	VERY SATISFACTORY	85.6000	VERY SATISFACTORY	81.1433	VERY SATISFACTORY
13	LORICO, JULIAN L.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	75.9248	VERY SATISFACTORY	100.0000	OUTSTANDING	83.1474	VERY SATISFACTORY
14	MADRIGALEJOS, DANILO JR. C.	79.2000	VERY SATISFACTORY	82.0000	VERY SATISFACTORY	81.08	VERY SATISFACTORY	97.6000	OUTSTANDING	80.7960	VERY SATISFACTORY
15	MAHAGUAY, ROLITO LACEDA	100.0000	OUTSTANDING	100.0000	OUTSTANDING	86.105	VERY SATISFACTORY	100.0000	OUTSTANDING	90.2735	VERY SATISFACTORY
16	MAIGUE, CHENNE	80.8000	VERY SATISFACTORY	82.8000	VERY SATISFACTORY	61.6874	SATISFACTORY	80.0000	VERY SATISFACTORY	67.6212	SATISFACTORY
17	MANALO, RICO M.	82.0000	VERY SATISFACTORY	82.0000	VERY SATISFACTORY	58.0988	SATISFACTORY	88.8000	VERY SATISFACTORY	65.2692	SATISFACTORY

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Faculty Online Evaluation
SUMMARY OF RESULTS
First Semester S.Y. 1617

	Name of Faculty	Supervisor Evaluator 1		Supervisor Evaluator 2		Student Evaluation		Self Evaluation		Over-all Evaluation	
		Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation	Rating	Interpretation
18	NATIVIDAD, FERDINAND O	100.0000	OUTSTANDING	100.0000	OUTSTANDING	74.6226	VERY SATISFACTORY	100.0000	OUTSTANDING	82.2358	VERY SATISFACTORY
19	NATIVIDAD, MARK KERVIN	83.6000	VERY SATISFACTORY	85.2000	VERY SATISFACTORY	71.6738	VERY SATISFACTORY	100.0000	OUTSTANDING	75.4117	VERY SATISFACTORY
20	OQUINDO, FLORINDA H	100.0000	OUTSTANDING	100.0000	OUTSTANDING	77.73	VERY SATISFACTORY	100.0000	OUTSTANDING	84.4110	VERY SATISFACTORY
21	PAJABERA, ORLANDO	85.2000	VERY SATISFACTORY	85.2000	VERY SATISFACTORY	85.0218	VERY SATISFACTORY	92.4000	OUTSTANDING	85.0753	VERY SATISFACTORY
22	PANGILINAN, KERUBIN	81.2000	VERY SATISFACTORY	83.6000	VERY SATISFACTORY	75.0162	VERY SATISFACTORY	92.8000	OUTSTANDING	77.1113	VERY SATISFACTORY
23	REYES, LUTZER UGTO	100.0000	OUTSTANDING	100.0000	OUTSTANDING	85.3796	VERY SATISFACTORY	100.0000	OUTSTANDING	89.7657	VERY SATISFACTORY
24	RODRIGUEZ, JOSHUA BENJAMIN	100.0000	OUTSTANDING	83.6000	VERY SATISFACTORY	86.2418	VERY SATISFACTORY	100.0000	OUTSTANDING	88.7293	VERY SATISFACTORY
25	SAWI, CHRISTOPHER M.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	90.465	VERY SATISFACTORY	98.8000	OUTSTANDING	93.3255	OUTSTANDING
26	SERVIANO, AZDIE	80.0000	VERY SATISFACTORY	80.0000	VERY SATISFACTORY	81.4362	VERY SATISFACTORY	96.8000	OUTSTANDING	81.0053	VERY SATISFACTORY
27	TENERIFE JR, PEDRITO	100.0000	OUTSTANDING	No Evaluation		83.2092	VERY SATISFACTORY	99.2000	OUTSTANDING	88.2464	VERY SATISFACTORY
28	VELASCO, ANTONIO Y.	100.0000	OUTSTANDING	100.0000	OUTSTANDING	68.45	SATISFACTORY	100.0000	OUTSTANDING	77.9150	VERY SATISFACTORY
29	VERZO, ALLAN	78.8000	VERY SATISFACTORY	79.2000	VERY SATISFACTORY	57.9826	SATISFACTORY	100.0000	OUTSTANDING	64.2678	SATISFACTORY

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PI
I.1.2

I.1. The faculty demonstrate professional competence and are engaged in any or a combination of the following:

I.1.2. research

Documents attached:

- LIST OF FACULTY WHO HAVE CONDUCTED AND/OR ARE CONDUCTING RESEARCH/RELATED TO THE PROGRAM
- RESEARCH DOCUMENTS
- SPECIAL ORDER No. 4219 Series of 2018

List of Faculty who have conducted and/or are conducting research/es relevant to the Program

Name of Faculty	Title of Research	Duration of Implementation	Funding Source	Status (On-Going/Completed)
Cansino, Julius . De La Cruz, Arvin R. Tenerife Jr., Pedrito M.	Impact Assessment of the Computer Engineering Learning Management System Evaluation	2019 - 2020	Personal	On-Going
Ado, Remedios G. Cansino, Julius .S. Mahaguay, Rolito L. Tenerife, Pedrito Jr. M.	Industry Perception on the Computer Engineering Graduates of the Polytechnic University of the Philippines	2019 - 2020	Personal	On-Going
De La Cruz, Arvin R. Tenerife Jr., Pedrito M.	Design and Development of Banana Fiber Decorticator with Wringer	2018 – 2019	Personal	Completed
De La Cruz, Arvin R.	Optical Character Reader of a Braille Unicode System for the Blind	2018 – 2019	Personal	Completed
De La Cruz, Arvin R.	E-Teaching Assistance Management System (ETAMS) with Educator Stress Determination for K*12, Tertiary, Graduate School and Distance Education	2018 – 2019	Personal	Completed
De La Cruz, Arvin R.	Optical Character Reader for the Blind	2018 – 2019	Personal	Completed
De La Cruz, Arvin R. Tenerife Jr., Pedrito M.	Image-Based Microalgae Cell Identifier and Counter	2018 – 2019	Personal	Completed
Ado, Remedios G. Mahaguay, Rolito L.	Development of e-Bag Wireless Charger for Gadgets	2017 – 2018	Personal	Completed
De La Cruz, Arvin R. Tenerife Jr., Pedrito M.	Design and Development of a Hybrid Photobioreactor for Biomass Production of Spirulina Platensis Species	2017 – 2018	Personal	Completed
Tenerife Jr., Pedrito M. Tubola, Orland D.	The Development of a Hybrid Renewable Energy: Powered Light Bouy System Harnessing Sea Energy Potentials	2017 – 2018	Personal	Completed
Cansino, Julius S. Tenerife Jr., Pedrito M. Fernando, Ronald D. Mahaguay, Rolito L.	College of Engineering Online Class Record	2017 – 2018	Personal	Completed

Natividad, Ferdinand O. Oquindo, Florinda H.				
Dela Cruz, John R.	Design of a Fuzzy-based Automated Organic Irrigation system for Smart Farm	2016 – 2017	Personal	Completed
Dela Cruz, John R.	Fuzzy-based Decision Support for Smart Farm Water Tank Monitoring	2016 – 2017	Personal	Completed
Tubola, Orland D.	Lung Disease Identification and Classification through Neural Networks	2015 – 2016	**Grant in Aid (PUP)**	Completed
Remedios G. Ado	Evaluation of SMART Wireless Engineering Education Program (SWEEP): Basis for a Proposed Integrated Model of Collaboration Between Industry and Academe	2014 – 2015	Personal	Completed
Ferdinand O. Natividad	Computer Engineering Laboratory Equipment Reservation and Monitoring System with Mobile Application	2014 – 2015	Personal	Completed
Remedios G. Ado	Engineering Academe Industry Partnership Towards Learning Exploration	2014 – 2015	Personal	Completed
Remedios G. Ado	Mobile Emergency Response Application Using Geolocation for Command Center	2013 - 2014	Personal	Completed
Natividad, Ferdinand O.	Enhanced Voiced Based Cane For The Blind With Anti-Lost Feature For The Resources Of The Blind Inc.	2012-2013	Personal	Completed
Oquimdo, Florinda H.	Groundwater Treatment using Bio-sand Filter in Sitio Centro Brgy. Cogunan Nasugbu, Batangas	2012-2013	Personal	Completed

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Pedrito M. Tenerife Jr.

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Design and development of banana fiber decorticator with wringer (Article)

Tenerife, P.M., Jr. ✉, De La Cruz, A.R. ✉, Arce, A.C.M. ✉, Pabularcon, M.A.N. ✉, Ortega, K.M.D. ✉, Rafallo, R.L.R. ✉

Polytechnic University of the Philippines, Philippines

Abstract

The demand for fiber as raw materials to make various products is increasing. It can be extracted from the seed, leaves, fruits and stem of a plant. Banana is one of the leading fruits grown in the Philippines. It provides food and a source of industrial raw materials. Aside from the fruit, banana blossom and its trunk pith that can be eaten, natural fiber can be extracted in the trunk (pseudo-stem) that is usually thrown as waste after the harvest season. The study aims to develop a machine that can extract fiber in a pseudo-stem which can be used in handicrafts, ropes, clothing and other products. A prototype was designed, developed and was tested for banana trunk fiber extraction. During the extraction process, the stem which is 45.72 cm in length and 1 cm thickness is fed manually in the prototype machine. Fiber is extracted from the pseudo-stem using a decortication process where a roller with scratched surface is compressed into a stationary bar that will crushed and scraped the trunk. During the decortication process the banana stem is also undergoing the wringing process wherein the fiber loses its water content. The extracted fiber is already dried and can be used in making domestic products. However, to have a good quality fiber, after the process, it should be washed and dried. Results indicated that the recovery rate of the banana fiber has increase by 2-3% in an average of 35.5 cm pseudo-stem. The device has a great potential and should be used for the growing fiber industry in the country. © BEIESP.

Author keywords

Bast fiber | Decortication process | Pseudo stem | Wringing process

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International Journal of Recent Technology and Engineering
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Optical character reader of a braille unicode system for the blind (Article)

De La Cruz, A.R. Legaspi, R.D. Mergilla, Z.L. Otawa, M.O.P.

Department of Computer Engineering, College of Engineering Polytechnic University of the Philippines, Sta. Mesa, Manila, Philippines

Abstract

--This study aspires to innovate braille system by applying the fast coping technological advancement of the world to it. Braille is a code – a system of dots that represents the letters of the alphabet and that visually impaired individuals can use to read independently. As Braille Technology is fast growing, more and more people with visual impairment cannot afford to bought one. Thus, the proponents created a prototype, a portable and a lot cheaper braille device that will help individuals and institutions for their reading challenges. The proponents created a braille display that comes up with a scanner that will scan physical text documents then process it to become an output as a braille cell. It also comes up with a text-to-speech conversion which will become an option for the involved person on what will he or she chooses as an output. This is made possible by Optical Character Recognition (OCR) technology that the proponents used in Raspberry Pi. The OCR is responsible for the image processing that will convert the image captured into a text file. The text file will then be processed again to send signal to the servo motor that is responsible for pushing the braille cells needed. The device also includes motor guide for correct scanning of the physical text documents. The device will perform the task quickly that will surely help visually impaired individuals to easily read reading materials. This system is conducted to provide another solution on problems about reading for blind and visually impaired individuals and to provide cheaper device for them. It will contribute not only to the community involved but also in the technological industry in the Philippines. ©BEIESP.

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Author keywords

Braille | Index Terms— braille | Optical Character Reader | Optical character recognition | Raspberry pi | Unicode System

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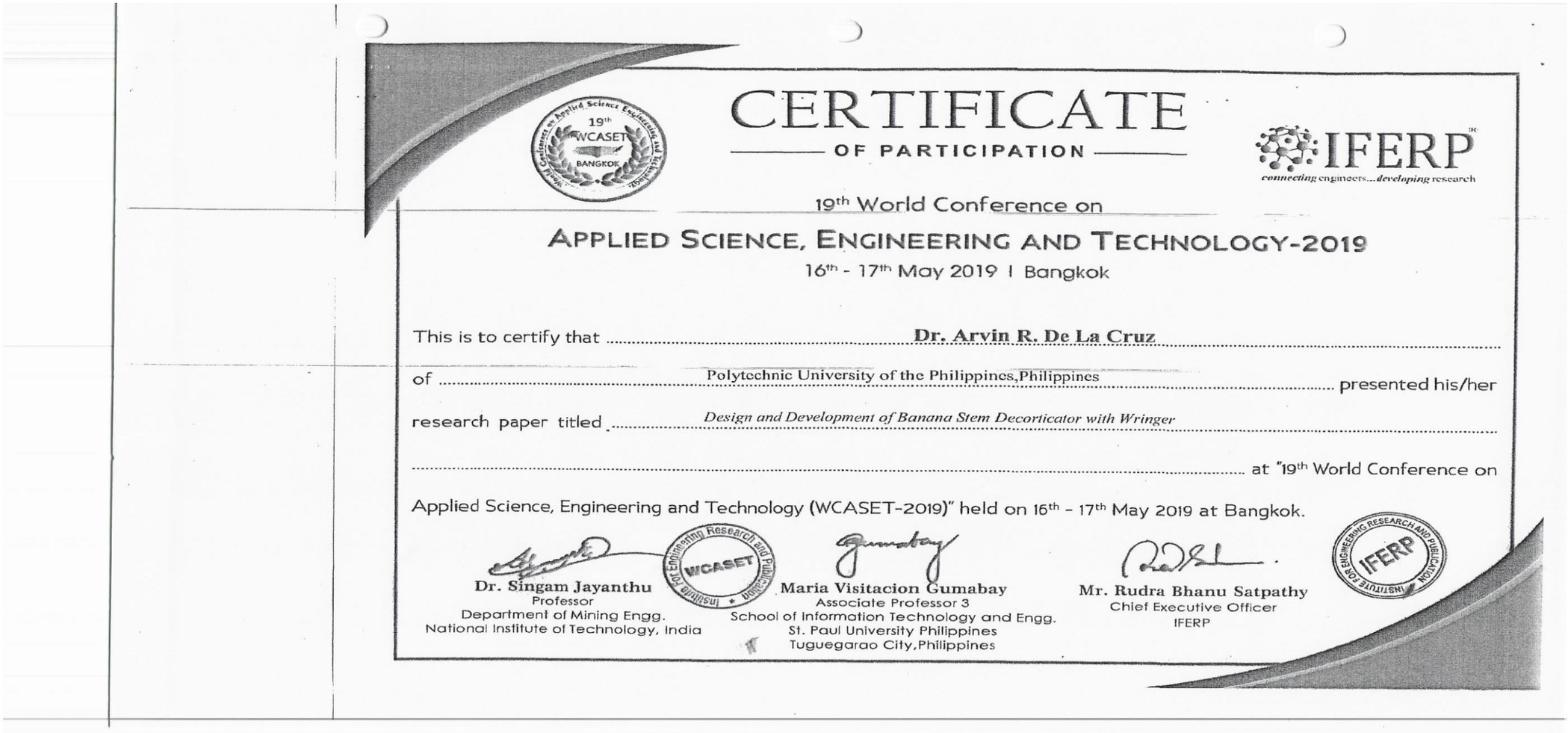

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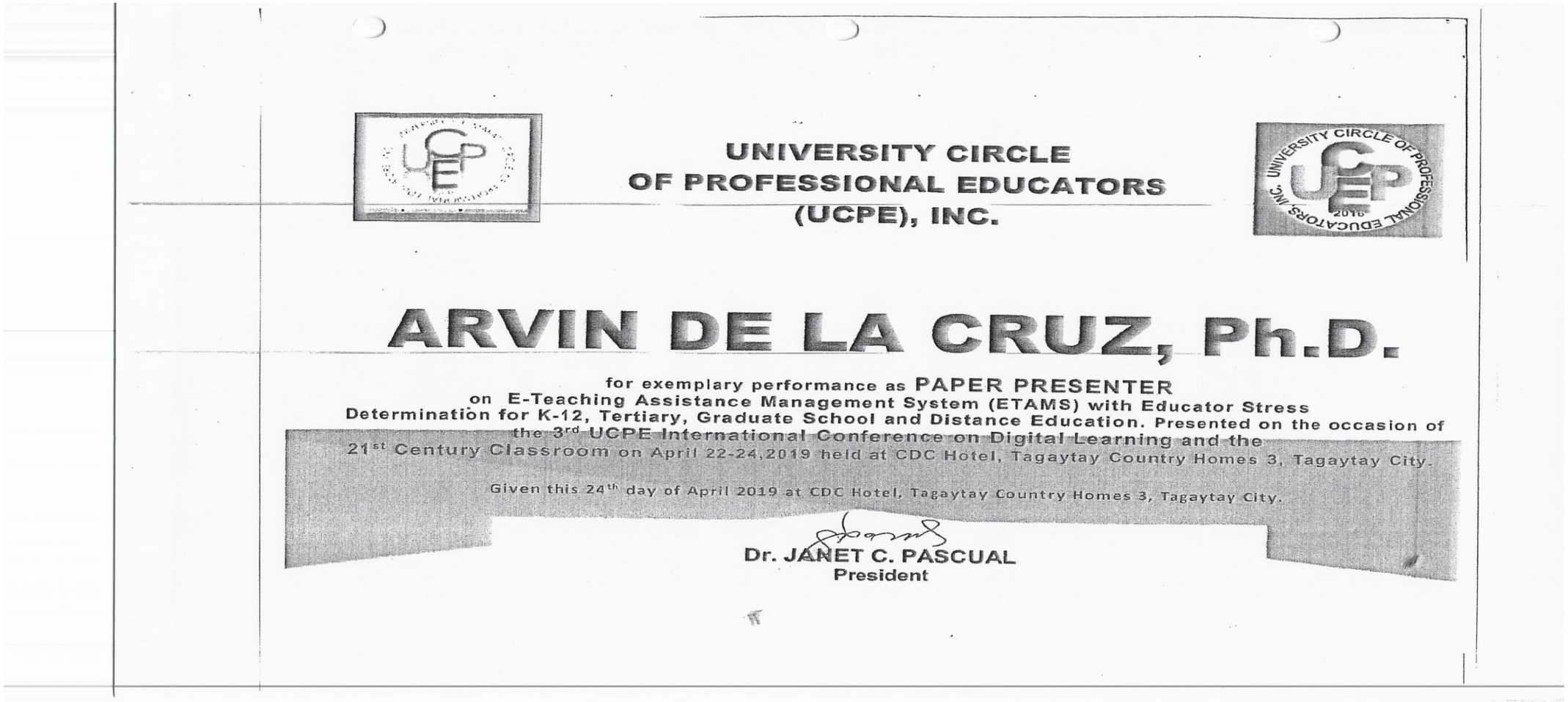

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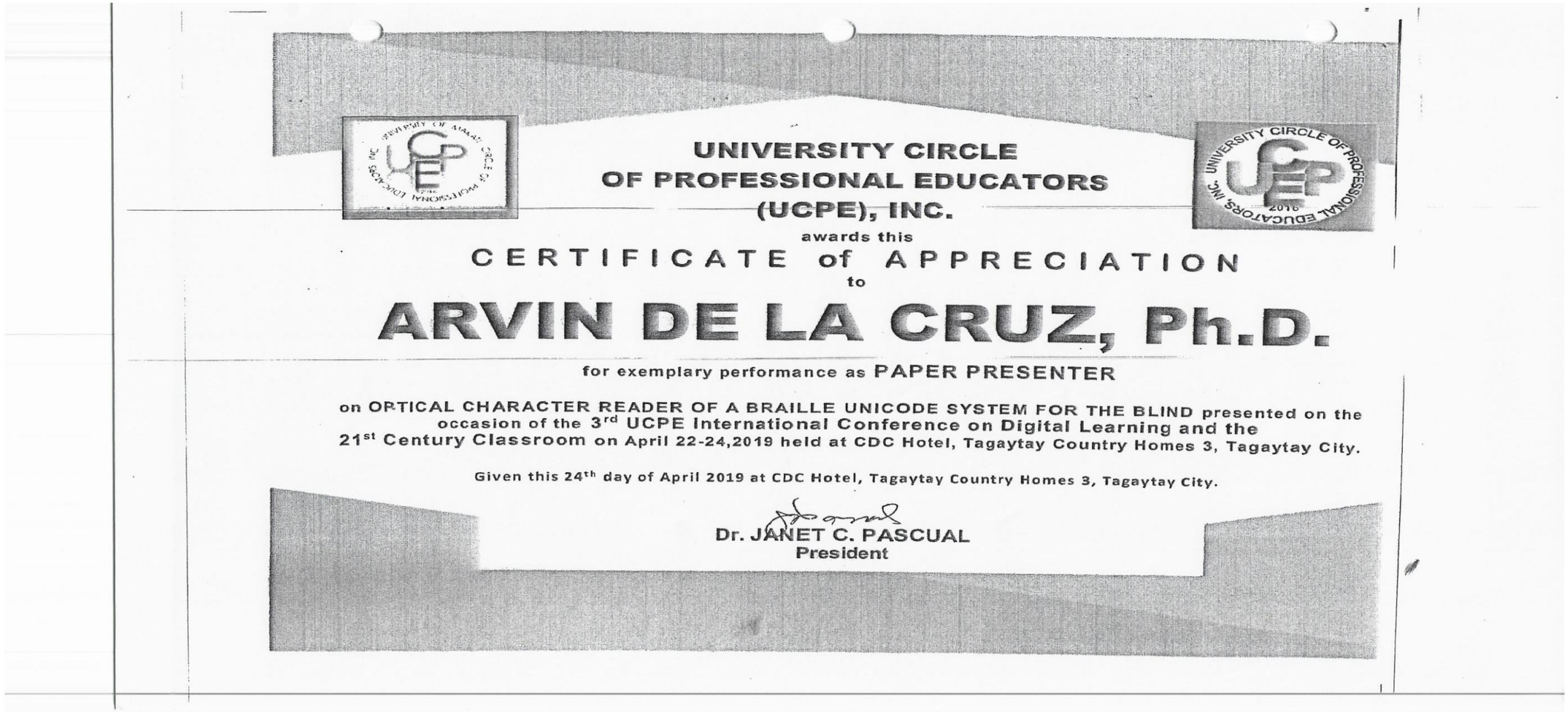
E-Teaching Assistance Management System (ETAMS) with Educator Stress Determination for K-12, Tertiary, Graduate School and Distance Education

Arvin R. De La Cruz
Faculty, Department of Computer Engineering, College of Engineering
Polytechnic University of the Philippines, Sta. Mesa, Manila

ABSTRACT

The purpose of this paper is to describe and introduce ETAMS on the K-12, tertiary, graduate school, and distance education in different institutions, colleges and universities in the Philippines. The study is about the development, deployment and assessment of an E-Learning tool called ETAMS, suited for K-12, tertiary, graduate school, and distance education as an additional teaching tool for educators. The main objective of the study is to assess the overall impact of ETAMS with all its features in terms of functionality, content and the level of acceptance in K-12, tertiary, graduate school, and distance education. The descriptive research method is used, as it describes the nature of the situation as it exists at the time of the study. The E-Learning tool undergoes a series of testing and different assessments utilizing innovative assessment mechanism as well as data mining approach.

Keywords
ETAMS, E-Learning, Stress, Moodle, Educators, and Stress Determination.



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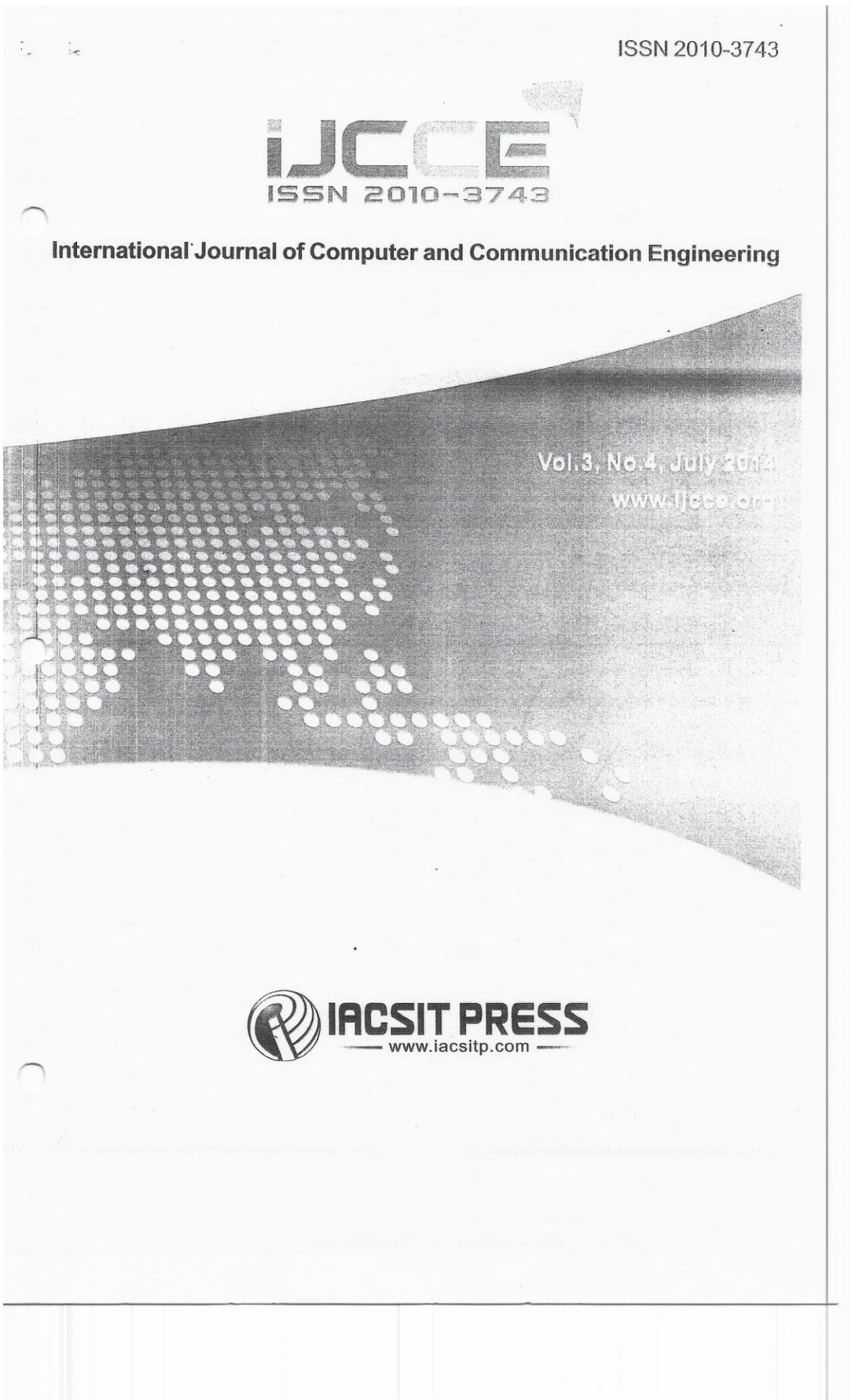
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International Journal of Computer and Communication Engineering

Mobile Emergency Response Application Using Geolocation for Command Centers

Jethro B. de Guzman, Ritz Carlo C. de Guzman, and Engr. Remedios G. Ado

Abstract—**This paper introduces Mobile Emergency Response Application using Geolocation for Command Centers. It is a combination of a mobile and web application for responding to emergency requests for ambulance, fire truck and police by people in a certain area or city. The mobile application would detect user's current location through geolocation and sends to the web application deployed in a command center the name, age, mobile number and location of the user for easily dispatching of emergency units.**

Index Terms—**Command center, emergency response, geolocation.**

I. Introduction

The actions and responses taken in the initial minutes of an emergency are critical. These life threatening events may happen any moment. Being always prepared and ready can save lives. A call for help to public emergency services that provides full and accurate information will help the dispatcher send the right responders and equipment.

Environmental emergencies are incidents or events that threaten public safety, health, and welfare and include hurricanes, floods, wildfires, industrial plant explosions, chemical spills, acts of terrorism, and others [1]. Emergency response is the organizing, coordinating, and directing of available resources in order to respond to the event and bring the emergency under control. The goal of this coordinated response is to protect public health by minimizing the impact of the event on the community and the environment.

One of the most popular and well known emergency systems in the world is America's 911. The system was designed to provide a universal, easy-to-remember number for people to reach police, fire or emergency medical assistance from any phone in any location, without having to look up specific phone numbers [2]. The technology, regulations and funding that make the system possible are largely based on the technology that existed at the time 911 was first implemented during the late 1960s –i.e., wired phones in residences and businesses.

The Philippines created its version of 911 called PATROL 117. Patrol 117 is the national and official emergency hotline number of the Philippines [3]. It aims to establish an easy recall number that can be accessed by anyone, anytime, anywhere in the Philippines in cases of emergencies, as well as to monitor the efficiency of its responders' network. It however, does not compete with other locally established emergency numbers or with local responders, but complements their local operations.

There are also a number of mobile applications available in smart phones that are beneficial in disaster response [4]. Among these are GPS technology, which can be used in the tracking of rescuers and resources, the translator, which can be used for communication, and the field examiner, which can be used to send information to headquarters for assessment of damages. Indeed, the use of a smart phone in a disaster management system is advantageous.

Command Centers handle certain communities. The release of a smart phone app increases the participation and preparation of the community in certain disasters. Ref. [5] Community-based disaster risk management is a process in which at-risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities. Ref. [6] internationally, the trend continues to build capacity in government disaster management capabilities and functions in developing nations and to promote community-based hazard mitigation planning and programs.

The use of new technologies like smart phones and web application play a big role in improving emergency system. Mobile devices have become increasingly important in the developing world, facilitating communication between locals, government officials and first responders [7]. Many applications provide important information in areas of health, agriculture, disaster relief, and crime.

The mass communications media not only quickly notifies the world of disastrous events, but many times their versions are greatly dramatized, if not distorted. In addition, news reports usually do not give specific information about the exact location of a disaster, or details to indicate who has or has not been involved. But with the use of geolocation, the location is plotted on the map and user's information will be sent to the command center [8].

Many of the emergency systems exists are landline-based. With the fast development in technology, especially the emergence of smartphones where almost many people hand carries these devices; we propose a system that would give people an alternative and added option or medium in calling for rescue. Providing the people a mobile application to be installed on their smart phones to send emergency requests and a web application to be deployed on command centers to receive and locate the mobile app users, this might be useful for easy and fast dispatching of emergency units.

II. Proposed System

A. Technologies Involved

The core concept of the researchers focuses on a mobile

Manuscript received December 5, 2013; revised March 12, 2014.
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and a web application. Our major goal is to provide information such as name, age, type of emergency response needed and location of a person using the mobile app and to be retrieved by a system on the web and plotting the equivalent latitude and longitude on a Google map in order to pinpoint the exact location of the person who uses the mobile app. To achieve it, the researchers also studied an extensive array of technologies focusing on computer engineering field.

For the mobile application, the researchers plan to use Phonegap instead of a native android language in order to maximize the user interface and to make it flexible and easy for other mobile platforms to adopt. Phonegap is a free and open source framework that allows you to create mobile apps using standardized web APIs for different mobile platforms. Basically it uses HTML, CSS and JavaScript, and wraps it with phonegap then deploy to different mobile operating systems like Android, iOS, Windows, Windows 8, Tizen, Blackberry, Blackberry 10.

QuoJS will be used as the main JavaScript Library for the mobile application. It is a micro, modular, Object-Oriented and concise JavaScript Library that simplifies HTML document traversing, event handling, and Ajax interactions for rapid mobile web development. It allows writing powerful, flexible and cross-browser code with its elegant, well documented and micro coherent API.

For getting the user's location, it requires to have a stable internet connection and an enabled GPS for more accurate reading of latitude and longitude points. Google Maps JavaScript API will be used to read user's geolocation. Reverse geocoding will also takes place in order to convert the geographic coordinates and display a human readable address to the user.

Since the researchers will focus more on running the mobile app on an android platform, Fries framework will be used. It is a mobile UI development framework that creates a native android-like feel using HTML, CSS and JavaScript.

For the web application, the researchers intend to use SailsJs. It is a MVC Framework for Node.js. Node.js is a platform built on Chrome's JavaScript runtime for easily building fast, scalable network applications. Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient, perfect for data-intensive real-time applications that run across distributed devices. We will also use Socket.io. Socket.IO aims to make real-time apps possible in every browser and mobile device, blurring the differences between the different transport mechanisms. It's care-free real-time 100% in JavaScript.

Tuktuk is the main UI framework for the web app. It is simple and a Responsive Web Design framework for creating websites and web applications. It contains HTML and CSS-based design templates for typography, forms, buttons, navigation and other interface components.

All the data will be stored on a MongoDB database. It is a NoSql and a document database that provides high performance, high availability, and easy scalability.

B. System Architecture

In the initialization of the mobile application, it detects the current position of the user through geolocation. The user can navigate in three tabs namely home, info and hotlines. The home tab contains the current location of the user. It is displayed on the map. Geographical points are converted into human-readable address. Three emergency buttons are present: ambulance, police and fire truck. The info tab contains details like name, age and mobile number of the user. He/She needs to input once and data will be save but he/she can edit if necessary. The hotlines tab contains other emergency hotlines. Since the application is internet dependent because of the geolocation, the emergency numbers are pre dialled enabling the user to call for emergency even without an internet. The system architecture for the mobile application is designed as described in Fig. 1.

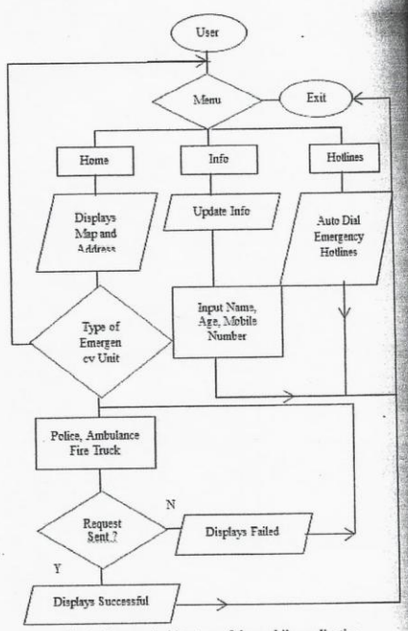

Fig. 1. System Architecture of the mobile application.

For the web application, the dashboard contains a map and a side bar where emergency reports are appended real time. The user can respond, decline and view the report on the map. The system architecture for the mobile application is designed as described in Fig. 2.

C. Graphical User Interface

The researchers provide graphical user interfaces for both mobile and web application where the users can interact with the emergency response system. Fig. 3 shows the prototype of the home tab of the mobile application where the users can select emergency request for ambulance, police and fire truck.

Fig. 4 shows the prototype of the info tab of the mobile application where the users can update their personal information that will be send to the command center.

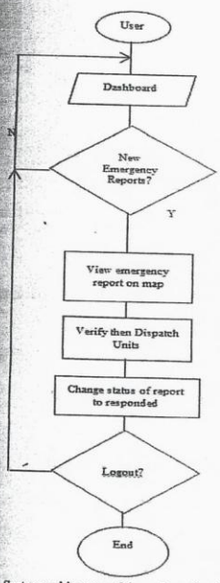

Fig. 2. System architecture of the web application.

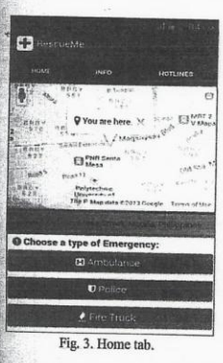

Fig. 3. Home tab.

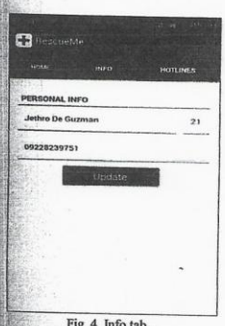

Fig. 4. Info tab.

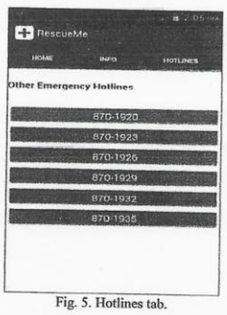

Fig. 5. Hotlines tab.

Fig. 5 shows the prototype of the hotlines tab of the mobile application where it contains pre dialled hotline numbers that can be used when the application is not connected in the internet.

Fig. 6 shows the prototype of the dashboard of the web application where it retrieves the sent emergency request and plot on the map the location from the mobile app user.

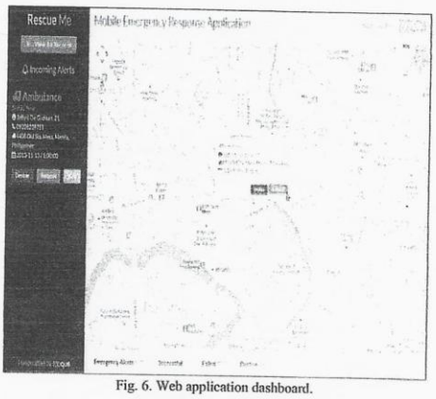

Fig. 6. Web application dashboard.

III. Scope and Limitation

The study is mainly focused on the development of a mobile emergency application for the community and a web application for Command Centers.

The mobile application can only run on devices particularly smart phones that run on an Android Operating System version 2.3 Gingerbread or Higher for the meantime. But the app can be ported to other platform since it will be created using Phonegap. While the web application, it can be accessed through the internet.

The mobile app can be downloaded by the community from a webpage where the web application is also hosted. The application basically would detect the user's current location. The user needs to fill up some personal information for verification, such as name, age and mobile number. The application is only limited into three emergency units such as ambulance, police and fire truck.

Once the user click to request a certain emergency unit, the application automatically send the user's geographical points using the phone's GPS together with the personal information. The Command Center's web application will retrieve the sent distress request from the mobile app and plot it in Google Maps real-time.

Since the mobile app needs to track the location of the user, it requires a stable internet connection. Without it, the application won't be able to send an emergency request. Because the application would rely to the IP address provided by the internet connection to locate the current position of the user in the map. The accuracy of the position's detection of the user also depend on the place and how stable the user's internet connectivity. The error of the GPS position is mainly determined by the interaction of the time varying constellation of the satellites and the built-up in the close vicinity [9]. The average position error ranges from 2 meters on an open square to 15 meters even in wide streets with four story houses on both sides. The built-up shades the satellites especially suitable for a positioning. The constellation of the satellites is periodic and the built-up constant, therefore a rudimentary database was used to reduce the positioning error by ~10%. We will also provide auto dialled links for other emergency hotlines in case the user won't have a chance to connect to the internet.

The mobile app cannot support location tracking for users on a moving vehicle. The app detects the last position of the user on the map, and that is the location to be sent to the command center.

IV. Conclusions

In this paper, we proposed the use of mobile and web technologies to add another option and medium for emergency response. The proposed method used the current trends in mobile and web technologies for fast and efficient dispatching of emergency units

Our goal is not to create a new protocol in emergency response, we have just maximize the use of smart phones to act as medium and to help people save their lives in case of disaster. Command centers will also benefit in a way that the location of the user are easily detected and plotted on a map.

Our porposed system supposed to lessen the response time it takes to respond to emergency events. It also provides reliable information that might help in identifying accidents.

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Enhanced Voiced Based Cane For The Blind With Anti-Lost Feature For The Resources Of The Blind Inc.

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ABSTRACT: The primary purpose of this paper is to enhance the Voice Based Cane to increase the mobility and independence in travelling of the blind and visually impaired. This paper is focused on helping them travel safely using Ultrasonic sensors mounted on the cane. Whenever an obstacle is found, the cane will vibrate and pre-recorded voice message gets activated telling the user of the obstacles location through the Bluetooth Headset. This enhanced device can be helpful to them through the use of Global Positioning System for others to track their location, a wireless switch which they can use to locate their cane if it is misplaced, a low battery indicator for them to know if the source needs to be recharged and the use of Bluetooth technology for the comfortability of the user while travelling without the hassle of wires.

KEY WORDS: (Mobility, independence, ultrasonic sensors, obstacle, global positioning system

1. BACKGROUND OF THE STUDY

High technology makes life easier not only to the average consumer, but also to people with disabilities. Technological progress is very good to help people with vision problems.

Blind people run the risk of colliding to an obstacle only when they are in movement relatively to their environment. We find that the usual companion of a blind man is the white cane. This helps in locating the static object in their path, thereby helping the blind users to travel by themselves. User can be alerted of close obstacles in range while travelling in their environment.

The enhanced project aims to minimize the size of the circuit wherein an Arduino microcontroller will be use so that it can be more handy but still reliable to use. This project works by alerting the user of obstacles detected via an Ultrasonic Sensor in its specific range. The system aims to increase the mobility of visually impaired people by offering new sensing abilities. Whenever an obstacle is found, the cane vibrates and a

pre-recorded voice message gets activated and the message is conveyed through a Bluetooth earphone. This tool can be useful to blind people in spatial sensing by supplying information during his movement if any obstacle is found. Furthermore this device has a GPS tracker which allows the relative/friends of the user to track him when needed or to find him when he is lost or is in danger. It also has an anti-lost feature wherein there is an interactive response from the cane activated by a wireless remote to help the user to find it if it is misplaced.

2. OBJECTIVES AND SIGNIFICANCE OF THE STUDY

2.1 Objectives

1. To enhance the Voice Based Cane for the blind and visually impaired
2. To be able to add features which can greatly help in their condition
3. To produce a product that is marketable

2.2 Significance of the Study

Next to life, the greatest gift of God is our eyesight. We've come up to this project to be able to help the people who lose their visions. We are aware of the challenges that blinds and visually impaired persons are facing. It is strongly needed to assist their disability. This project can increase their independency that they can go beyond the boundaries of their homes and familiar environments. Thus, it can guide the user in their mobility even in unfamiliar environments which have a very significant social impact. It is also useful to RBI for they will have an additional tool to give or lend the members of their foundation which are the blinds and the visually impaired.

3. RESEARCH FRAMEWORK AND PROCESSES

The project's concept is to enhance the white cane and the previously done electronic cane by adding sensors, GPS, vibration functionality and a dedicated object locator for the cane while maintaining its portability. The circuit will be interfaced to an Arduino Microcontroller rather than a PIC microcontroller, which is used by the previous project, and it is projected to be light and small, keeping it portable for the user to use.

Input

- Obstacles on the pathway of the user will serve as the input for the ultrasonic sensor attach to the device.
- GPS device will request and receive information/signal to/from the satellites orbiting the earth.
- The user will trigger the wireless switch dedicated for finding the cane if it's misplaced.

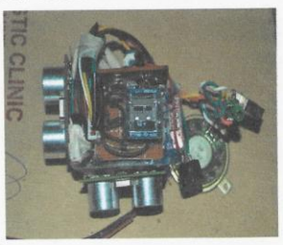
Process

- When the sensor receives the input signal, it will send the signal to trigger the delivery of the pre-recorded voice to the output.
- At least three or more satellite will send data then the receiver will calculate the position of the GPS device.
- The receiver on the cane will receive the signal from the wireless switch.

Output

- A vibration on the cane and a pre-recorded voice message output to the earphone/wireless headset.
- The GPS device outputs the result of the calculation of the location of the user.
- A beeping sound output in the cane to help the user to find it.

There will be a switch to turn on and off the device and another switch for the side sensors. There will be two sensors for the front, above and below. The 6v battery slot is in the handle. GPS and Bluetooth will be inside the circuit case where the ultrasonic sensors are also placed. There will also be a standard audio jack and a speaker. The height of the whole device is approximately 120 cm and the circuit case only is 30 cm with the width of 5 cm.



4. OUTPUT AND FINDINGS

The enhanced voice based cane for the blind with anti-lost feature's components and its finished product.

Figure 1: Photo of the heart of our system

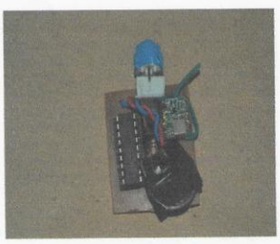


Figure 2: Photo of the wireless switch

Figure 3: Photo of the final look of our enhanced voice based cane

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Groundwater Treatment using Bio-sand Filter in Sitio Centro Brgy. Cogunan Nasugbu, Batangas

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ABSTRACT: The researchers look for a place where people didn't have a potable source of water. They found out that some places in Brgy. Cogunan Nasugbu, Batangas didn't have their potable source of water. The purpose of the project is to promote the Bio-sand Filter so that needy people will have a source of potable water supply. The researchers used descriptive method and developmental research method to gather information about the place, groundwater and water treatment. They found out that Bio-sand is a low-cost technology water purifier and the natural way of water filtration. The system will start after the water had been extracted from the shallow well using the automatic pump and delivers it to the first basin, then the solenoid valve will be the controlling element to the bio-sand filter and lastly the filtered water will be transported to the last basin which has the LCD display that determines the water volume. The process will be spontaneous in order to have enough supply of drinking water for the entire community. Also there are two other basins that will store water (not filtered) for other household purposes.

KEY WORDS: Water treatment, bio-sand, filter, groundwater, purifier

1. BACKGROUND OF THE RESEARCH

Groundwater is water that comes from the ground. Sounds easy, doesn't it? Amazingly, many people use groundwater but don't even know it. Groundwater is stored in the ground in materials like gravel or sand. It's kind of like the earth is a big sponge holding all that water. Water can also move through rock formations like sandstone or through cracks in rocks. An area that holds a lot of water, which can be pumped up with a well, is called an aquifer. Wells pump groundwater from the aquifer and then pipes deliver the water to cities, houses in the country, or to crops.

The quality of ground water in some parts of the country, particularly shallow ground water, is changing as a result of human activities. Ground water is less susceptible to bacterial pollution than surface water because the soil and rocks through which ground water flows screen out most of the bacteria. Bacteria, however, occasionally find their way into ground water, sometimes in dangerously high concentrations. But freedom from bacterial pollution alone does not mean that the water is fit to drink. Many unseen dissolved mineral and organic constituents are present in ground water in various

concentrations. Most are harmless or even beneficial; though occurring infrequently, others are harmful, and a few may be highly toxic.

In terms of groundwater, our country has an extensive groundwater reservoir with an aggregate area of about 50,000 sq km. Data from the Mines and Geosciences Bureau (MGB) show that several groundwater basins are underlain by about 100,000 sq km of various rock formation and that these resources are located in: Northeast Luzon, Central Luzon, Laguna Lake basin, Cavite-Batangas-Laguna basin, Southeast Luzon, Mindoro Island, Negros Island, Northeast Leyte, Ormoc-Kananga basin, Agusan-Davao basin, Occidental Misamis basin, Lanao-Bukidnon-Misamis basin.

Nasugbu is bounded on the north by the municipalities of Maragondon, Magallanes and Alfonso in the province of Cavite; on the east by the Batangas municipalities of Laurel, Calaca and Balayan; on the south by the Batangas municipalities of Lian and Tuy; and on the west by the South China Sea. It is the largest town in Western Batangas with a land area of 276.33 km².Entering the town proper via the national highway, one passes fields of sugar cane, corn and rice fields, hills and mountains. The terrain slopes downwards to the South China Sea. Because of its rolling terrain and coastline location, agriculture (sugarcane, rice, corn, vegetables, coconut, and fruits) and aquaculture are Nasugbu's main industries.

Nasugbu is a first class municipality in the province of Batangas, Philippines. According to the latest census, it has a population of 113,926 people in 19,615 households. Nasugbu is politically subdivided into 46 barangays.

Brgy. Cogunan is one of the rural places in the province of Nasugbu Batangas, it has 1,018 families, 935 households and a total population of 4,355 residents as of January 2011. Brgy. Cogunan has an area of 649 hectares including sugarcane farm. Inside the Cogunan is the small Sitio Centro which has a population of 653. The main problem of this place is they lack access to a clean water supply, there's no water stations located on this area; the main source of water is only the wells and water pumps. They're not aware on the other ways of water treatment aside from boiling.

Boiling is what has been used to disinfect water from microorganisms. In fact, when done correctly, it can kill most bacteria, but not all. Bacteria and protozoa are killed at the first bubble, and it takes about three minutes to kill the rest. The drawbacks to this method however are that first of all, it can require lots of fuel and cooking equipment. Secondly, water cannot be then used immediately, as it needs to cool down. Thirdly, since it is so hot, some of the water may evaporate before its use. Fourth, the water can still contain particles; so further filtering through a handkerchief could be necessary. Finally, boiling water does not eliminate chemical pollutants.

2. OBJECTIVE AND SIGNIFICANCE OF THE STUDY

The objective of the study is to prove that bio-sand filter can help people in remote areas to purify groundwater for drinking and to help indigent people afford a low cost water purifier by using bio-sand filter.

The research can be a greater help to anybody especially to those people who were experiencing water scarcity and different waterborne diseases. Less disease means a healthy community.

The benefit/s to the people, it can help the residence of Sitio Centro Brgy. Cogunan Nasugbu, Batangas to improve the quality of their drinking water that they get from wells. This may also help people in remote areas who have a minimal source of clean

water supply to have a clean and safe drinking water and help to wane different water-borne diseases.

To the Local Government of Batangas, this can be a part of campaign of the government to promote safety and security regarding health issues. It also helps the government to promote a low-cost water treatment technology that will help a lot of people who can't afford Hi-tech purifiers. And it can give supplies of water in evacuation center in times of calamity.

To the students, the study can be a part of new innovation for understanding the effects of upgrading the normal process into conventional process and conventional process into more convenient and more efficient process of groundwater treatment.

3. RESEARCH FRAMEWORK AND PROCESS

The research study starts with the problem determined by the proponents. In some areas of Brgy. Cogunan Nasugbu, Batangas they don't have a potable source of water. Their main sources of water are mostly in wells and water pumps which is a ground water which they use for drinking and other household purposes. But the thing is that they were not sure if this water fits the standard of a drinking water.

The research study Groundwater Treatment Using Bio-Sand Filter in Sitio Centro Brgy. Cogunan, Nasugbu Batangas used the descriptive research method which describes data and characteristics about the population, the water source and the phenomenon. The researchers gathered information about the water in Batangas; its population; number of common water source; facts about bio-sand filter, its efficiency and its deficiency; and how can groundwater be filtered and purified. This method enables the researchers to interpret the theoretical meaning of the data gathered as well as the development of the hypothesis for further research studies. This method besets all the gathered data useful in adjusting or meeting the expected phenomenon.

This study also made use of developmental method which was designed for studies that involves systematic work, from the basic information of groundwater through the system and automation to be used for treatment. The researchers draw existing knowledge gained from several researches, studies and personal experiences that were purposely directed to a specific goal. As used in this study, the development of the Groundwater Treatment using Bio-Sand was done.

In this study, questionnaires were used as an instrument in gathering the necessary information needed in using the descriptive method. The questionnaire was intended to obtain information from the residents regarding the importance and problem they are experiencing on their water usage. It will also show the awareness to the groundwater treatment. The questionnaires will also show the popularity of the project if ever possible it will be out in the market.

To further understand on how the project should be made, the researchers conduct surveys and visit the place in order to improve the overall performance of the project. By this method, the researchers were able to understand how to fully optimize the functionality of the system.

4. OUTPUT AND FINDINGS

The output of the design project is the installed Sitio Centro Brgy. Cogunan Nasugbu, Batangas. Bio-sand filters are a point of use filtration system, which remove pathogens and suspended solids from water. As compared to other point of use systems, such as chlorination or solar disinfection, bio-sand filters are easier to operate, and less expensive, and good alternatives especially in needy places.

The system guaranteed the residents of Sitio Centro, Brgy. Cogunan of a free-potable water. Even if some of them live a bit far from the place, it's worth the long trail because their family will be able to have a safe, drinking water.

5. RECOMMENDATION

The project would be very beneficial to every residents of Sitio Centro, Brgy. Cogunan at Nasugbu, Batangas if maintain and properly supervised. The proponents wish to recommend handling the whole system with proper care.

The proponents provide guidelines on how to clean and maintain the system; also they stated some basics to troubleshoot the system.

- The proponents recommend enhancement for the system like making another connection from the final storage to other household in order for the residents far from the place, need not to go there.
- Also, in need of implementing regular meetings within the barangay in order to have the full cooperation of the residents and proper assignment on cleaning the containers.

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Optical Character Reader of a Braille Unicode System for the Blind

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ABSTRACT

This study aspires by innovate braille system by applying the fast coping technological advancement of the world to it. Braille is a code – a system of dots that represents the letters of the alphabet and that visually impaired individuals can use to read independently. As Braille Technology is fast growing, more and more people with visual impairment cannot afford to bought one. Thus, the proponents created a prototype, a portable and a lot cheaper braille device that will help individuals and institutions for their reading challenges. The proponents created a braille display that comes up with a scanner that will scan physical text documents then process it to become an output as a braille cells. It also comes up with a text-to-speech conversion which will become an option for the involved person on what will visually impaired individual chooses as an output. This is made possible by Optical Character Recognition (OCR) technology that the proponents used in Raspberry Pi. The OCR is responsible for the image processing that will convert the image captured into a text file. The text file will then be processed again to send signal to the servo motor that is responsible for pushing the braille cells needed. The device also includes motor guide for correct scanning of the physical text documents. The device will perform the task quickly that will surely help visually impaired individuals to easily read reading materials. This system is conducted to provide another solution on problems about reading for blind and visually impaired individuals and to provide cheaper device for them. It will contribute not only to the community involved but also in the technological industry in the Philippines.

Keywords

braille, optical character recognition, raspberry pi, Braille, Unicode System, Optical Character Reader

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SPECIAL ORDER
No. 4219, s. 2018

In the interest of the service, **ENGR. PEDRITO M. TENERIFE, JR.**, *Faculty Member, College of Engineering*, this University, was authorized to attend on official time the 2nd **International Conference on Innovative Research in Science, Technology and Management (ICIRSTM-18)** to present his research paper entitled ***"Design and Development of a Hybrid Photo Bioreactor for Biomass Production of Spirulina Platensis Species"*** at *National University of Singapore* on *September 29 – 30, 2018.*

Engr. Tenerife shall be given financial assistance amounting to **SEVENTY FIVE THOUSAND PESOS ONLY (P75,000.00)**, pursuant to Memorandum Order No. 19, series of 2018 dated June 26, 2018, *Revised Implementing Guidelines on Paper Presentation Financial Assistance*, subject to the usual accounting and auditing rules and regulations.

He is required to submit his certificate as *paper presenter* and a report on the proceedings to the Human Resource Management Department in thirty (30) working days from receipt of this order.

EMANUEL C. DE GUZMAN, PhD
President

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of Presentation

This is to certify that **Pedrito M. Tenerife Jr.**

has presented the paper entitled **Design and Development of a Hybrid Photobioreactor for Biomass Production of Spirulina Platensis Species**

at ICIRSTM-II held at UTown (NUS), Singapore organized by International Institute of Research & Journals (WWPET) on 29 - 30 September, 2018.

ICIRSTM 2018

Paper Id
IRP-IRSTM-SG-2930918-524

Dr. H M Duong
NUS Associate Professor

PI
I.1.3

I.1. The faculty demonstrate professional competence and are engaged in any or a combination of the following:

I.1.3. extension;

Documents attached:

- LIST OF FACULTY WHO ARE ACTIVELY INVOLVED IN EXTENSION ACTIVITES RELEVANT TO THE PROGRAM
- CERTIFICATES

List of faculty who are actively involved in Extension activities relevant to the Program

Extension Activity	Location/Site	Date done	Faculty Involved and Participation	Photo documentation
Basic Computer Operation and Windows Movie Maker Basic HTML and Web Development	Maligaya High School	March 19, 2008	Engr. Julius S. Cansino Engr. Florinda H. Oquindo Engr. Rodolfo Talan Engr. Remedios G. Ado	
PC Assembly, PC Troubleshooting Networking Database Management System Introduction to Internet	San Francisco High School	March 31, 2008	Engr. Julius S. Cansino Engr. Florinda H. Oquindo Engr. Rodolfo Talan Engr. Remedios G. Ado	

Web Designing, Computer Literacy	Kalinga at Pagibig Found.	March 25, 2009	Engr. Remedios G. Ado Engr. Florinda H. Oquindo Engr. Ferdinand NAtividad Engr. Allan Verzo Engr. Pedrito Tenerife	
Livelihood Program	Habitat for Humanity Inc.	October 6, 2009	Engr. Remedios G, Ado Engr. Rafael Oquindo Engr. Florinda H. Oquindo Engr. Antonio Velasco Engr. Julius S. Cansino Engr. Ferdinand Natividad Engr. Ronald Fernando Engr. Pedrito Tenerife	
Web Designing, Computer Literacy	Kalinga at Pagibig Found.	June 3-4, 2010	Engr. Remedios G. Ado Engr. Florinda H. Oquindo Engr. Ferdinand NAtividad Engr. Allan Verzo Engr. Pedrito Tenerife	

Student In Free Enterprise	SIFE Phils.	July 2 - 3, 2010	Engr. Remedios G. Ado Engr. Florinda H. Oquindo Engr. Allan Verzo Engr. Norman De Los Reyes	
Computer Literacy Training	Pio Elem. School, Sta. Mesa, Manila	2011	Engr. Remedios G. Ado Engr. Florinda H. Oquiindo Engr. Pedrito Tenerife Engr. Ferdinand Baylon Engr. Norman delos Reyes Engr. Ferdinand Natividad	
Introduction of F/OSS; Making a GIF using GIMP 2.6	Rizal High School	October 10, 2011	Engr. Remedios G. Ado Engr. Florinda H. Oquindo Engr. Baylon Engr. Ferdinand O. Natividad	

Student In Free Enterprise	SIFE Phils.	July 6-7, 2012	Engr. Remedios G. Ado Engr. Florinda H. Oquindo Engr. Allan Verzo Engr. Norman De Los Reyes	
Sagip Kapamilya	Victims of calamity in nearby places	August 2012	Engr. Florinda Oquido, Engr. Orland D. Tubola, Engr. Antonio Velasco	
Marikina Relief Operation	Victims of calamity in nearby places	August 2012	Engr. Florinda Oquido, Engr. Orland D. Tubola, Engr. Antonio Velasco	

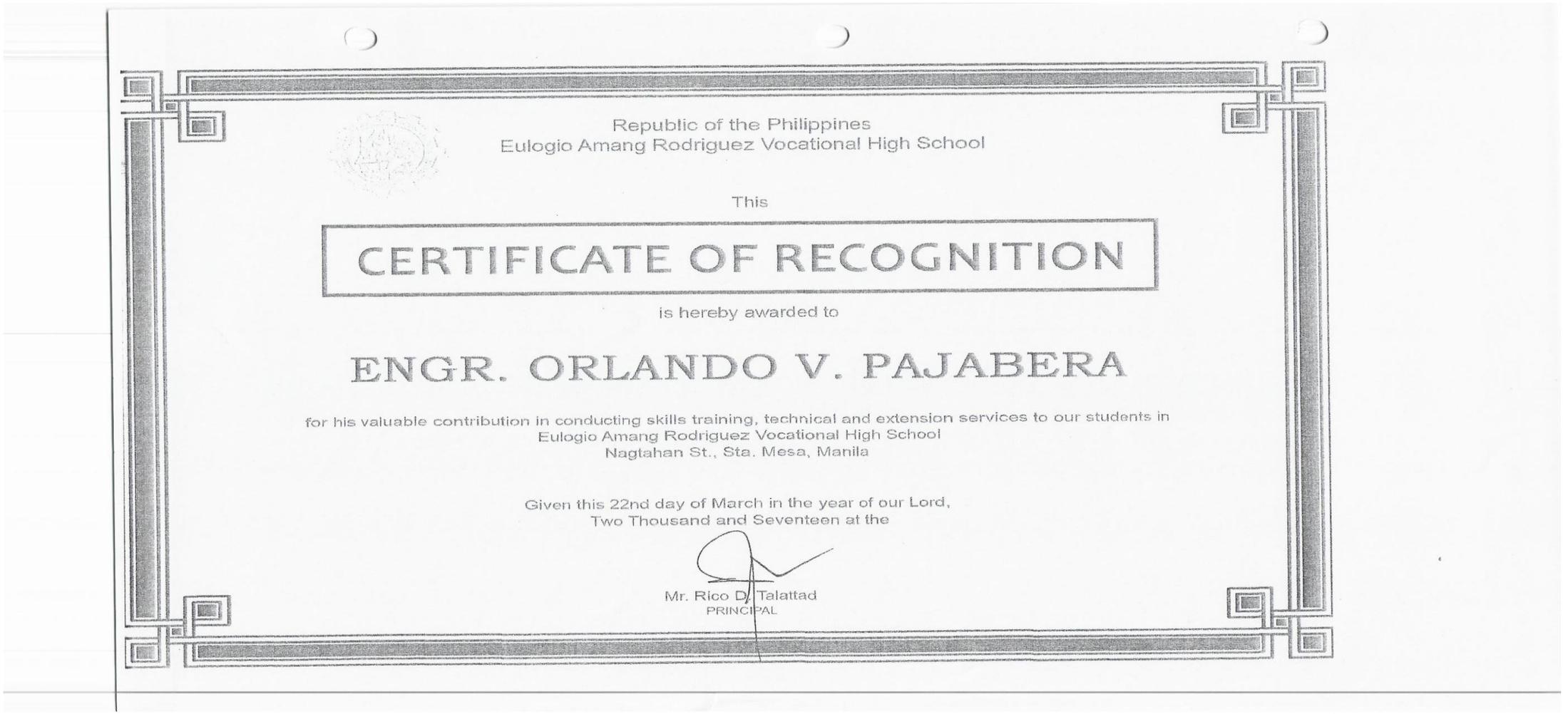
Counting of Election Returns	Philippines	May 18 – 19,2013 May 25 – 26,2013	All CoE Faculty	
PC Trouble Shooting, Basic Networking	San Juan East Central School San Juan, Batangas	September 28. 2013	Engr. Rolito Mahaguay, Engr. Florinda H. Oquindo, Engr. Rafael R. Oquindo, Engr. Pedrito M. Tenerife Jr., Engr. Orland Tubola, Engr. Allan Verzo	
CE Skills Training and Literacy Program	College of Engineering and Architecture Bldg., NDC Compound, Sta. Mesa, Manila	December 16, 2017	Dr. Remedios G. Ado Engr. Julius S. Cansino Dr. Arvin R. De La Cruz Engr. Ronald D. Fernando Engr. Rolito L. Mahaguay Engr. Ferdinand O. Natividad Engr. Florinda H. Oquindo Engr. Orlando V. Pajabera Dr. Lutzer U. Reyes Engr. Pedrito M. Tenerife Jr. Dr. Antonio Y. Velasco	

CE Skills Training and Literacy Program	College of Engineering and Architecture Bldg., NDC Compound, Sta. Mesa, Manila	December 16, 2018	Dr. Remedios G. Ado Engr. Julius S. Cansino Dr. Arvin R. De La Cruz Engr. Ronald D. Fernando Engr. Rolito L. Mahaguay Engr. Ferdinand O. Natividad Engr. Florinda H. Oquindo Engr. Orlando V. Pajabera Dr. Lutzer U. Reyes Engr. Pedrito M. Tenerife Jr. Dr. Antonio Y. Velasco	
Basic Electrical House Wiring training	Brgy. Sto. Nino, San Mateo, Rizal	***Phase 1***: August 30, 2019 ***Phase 2***: September 15, 2019	***Phase 1***: Dr. Remedios Ado Dr. Maria Theresa Bongulto Engr. Daniel Durias Engr. Carmelita Durias Engr. Kenneth Bryan Tana Engr. Vilma Perez ***Phase 2***: Dr. Maria Theresa Bongulto Engr. Joselinda Golpeo Engr. Vilma Perez Engr. Orlando V. Pajabera	

Solid Waste Management training	Brgy. 884 – 97 Hugo St., Sta. Ana, Manila	***Phase 1***: September 21, 2019 ***Phase 2***: September 28, 2019 ***Phase 3***: October 5, 2019	***Phase 1***: Dr. Maria Theresa Bongulto Engr. Kathleen Macapagal Prof. Josefina Pavon ***Phase 2***: IDr Arlene Magpayo Dr. Maria Theresa Bongulto Dr. Roland Viray ***Phase 3***: Dr. Maria Theresa Bongulto Dr. Roland Viray Engr. Arvin Jay Austria Engr. Joy Cabangon Engr. Daniel Durias Engr. Orlean Dela Cruz	

Prepared by:

Pedrito M. Tenerife Jr.



Republic of the Philippines
Eulogio Amang Rodriguez Vocational High School

This

CERTIFICATE OF RECOGNITION

is hereby awarded to

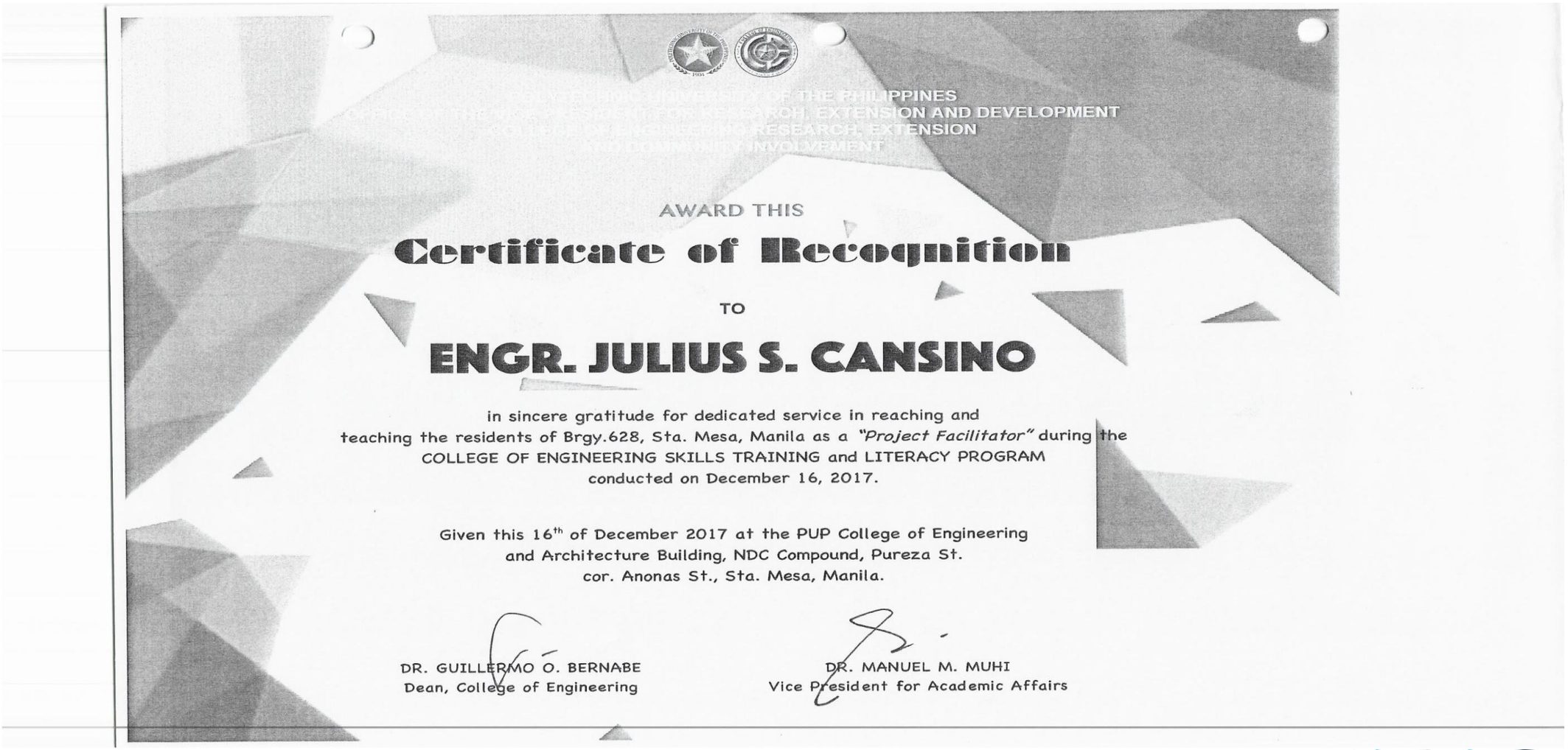
ENGR. ORLANDO V. PAJABERA

for his valuable contribution in conducting skills training, technical and extension services to our students in
Eulogio Amang Rodriguez Vocational High School
Nagtahan St., Sta. Mesa, Manila

Given this 22nd day of March in the year of our Lord,
Two Thousand and Seventeen at the

Mr. Rico D. Talattad
PRINCIPAL

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
ANONAS COR. PUREZA STREETS, STA. MESA, MANILA



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
OFFICE OF THE VICE PRESIDENT FOR RESEARCH, EXTENSION AND DEVELOPMENT
COLLEGE OF ENGINEERING RESEARCH, EXTENSION
AND COMMUNITY INVOLVEMENT

AWARD THIS

Certificate of Recognition

TO

ENGR. JULIUS S. CANSINO

in sincere gratitude for dedicated service in reaching and
teaching the residents of Brgy.628, Sta. Mesa, Manila as a *"Project Facilitator"* during the
COLLEGE OF ENGINEERING SKILLS TRAINING and LITERACY PROGRAM
conducted on December 16, 2017.

Given this 16th of December 2017 at the PUP College of Engineering
and Architecture Building, NDC Compound, Pureza St.
cor. Anonas St., Sta. Mesa, Manila.

DR. GUILLERMO O. BERNABE
Dean, College of Engineering

DR. MANUEL M. MUHI
Vice President for Academic Affairs

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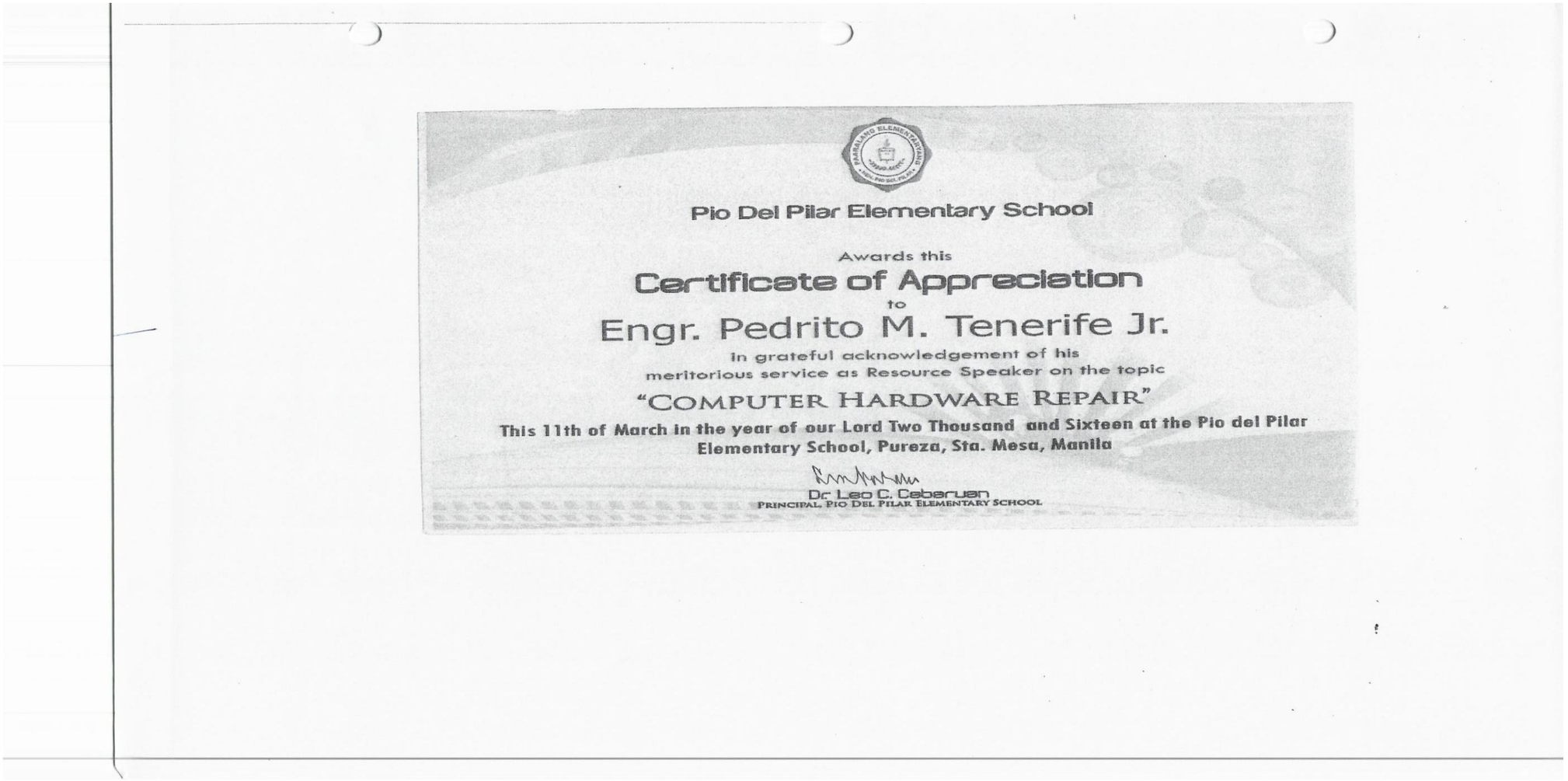


Pio Del Pilar Elementary School

Awards this

Certificate of Appreciation

to

Engr. Pedrito M. Tenerife Jr.

in grateful acknowledgement of his
meritorious service as Resource Speaker on the topic

"COMPUTER HARDWARE REPAIR"

This 11th of March in the year of our Lord Two Thousand and Sixteen at the Pio del Pilar Elementary School, Pureza, Sta. Mesa, Manila

Dr Leo C. Ceberuan
PRINCIPAL, PIO DEL PILAR ELEMENTARY SCHOOL

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

Rotary International

District 3780
ROTARY CLUB OF UPTOWN NOVALICHES

Certificate of Recognition

Awards this to

ENGR. FERDINAND NATIVIDAD

in sincere appreciation of the very commendable services she rendered as

AS TRAINOR IN COMPUTER SERVICING

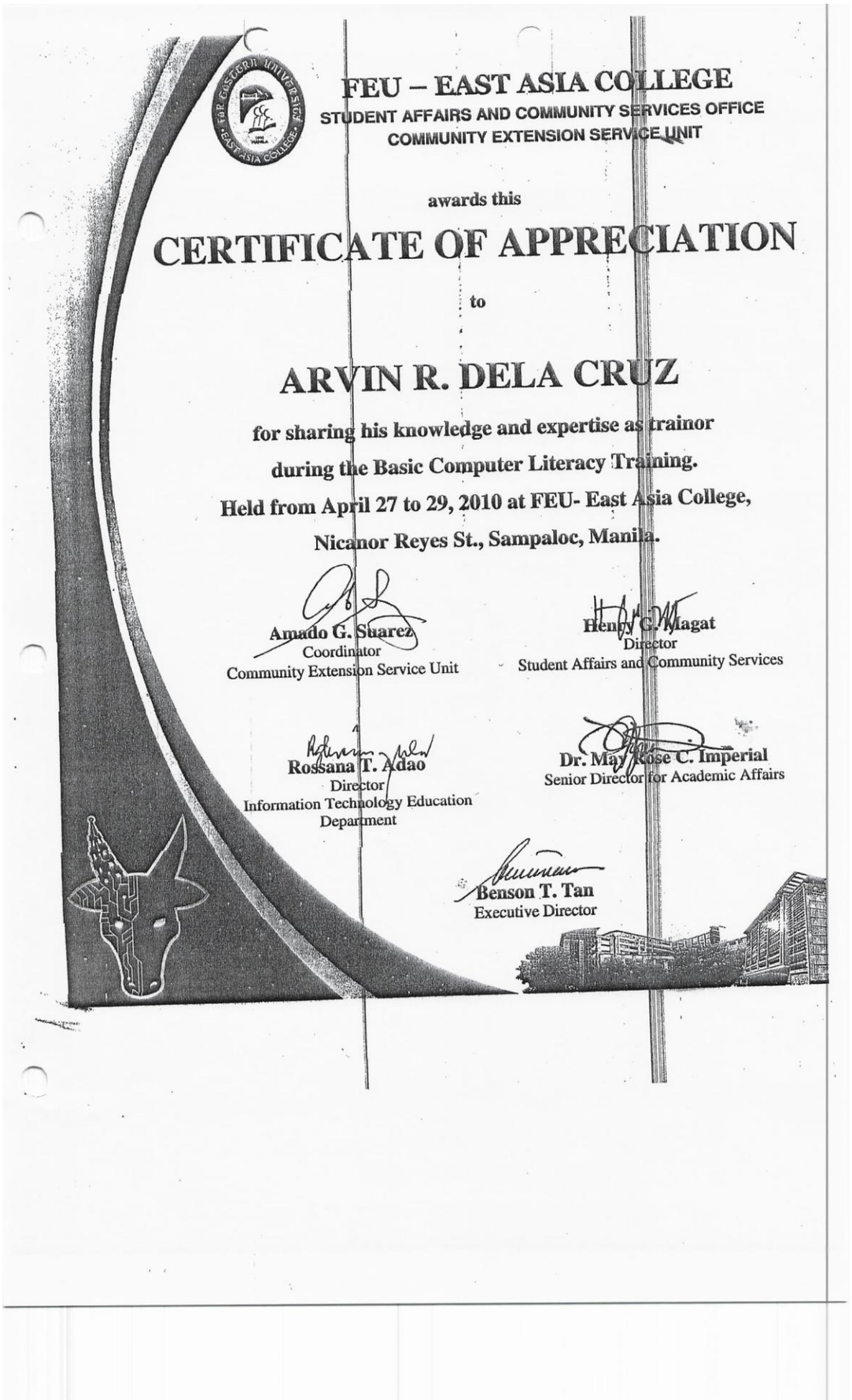
during the PUP-CE Summer Skills Training 2010, has successfully completed the partners in community service in LITERACY PROGRAM.

Given this 4th day of June 2010 at the Papaya Academy Calavite St. Kasiglahan Main road, San Jose Rodriguez Rizal

IP. PABLO MANGAHAS
Immediate President 2009-2010

PP.TONY VELASCO
President Elect 2010-2011

PP. LINDA ELEQUIN
Past President, RCUN



FEU – EAST ASIA COLLEGE
STUDENT AFFAIRS AND COMMUNITY SERVICES OFFICE
COMMUNITY EXTENSION SERVICE UNIT

awards this

CERTIFICATE OF APPRECIATION

to

ARVIN R. DELA CRUZ

for sharing his knowledge and expertise as trainor
during the Basic Computer Literacy Training.
Held from April 27 to 29, 2010 at FEU- East Asia College,
Nicanor Reyes St., Sampaloc, Manila.

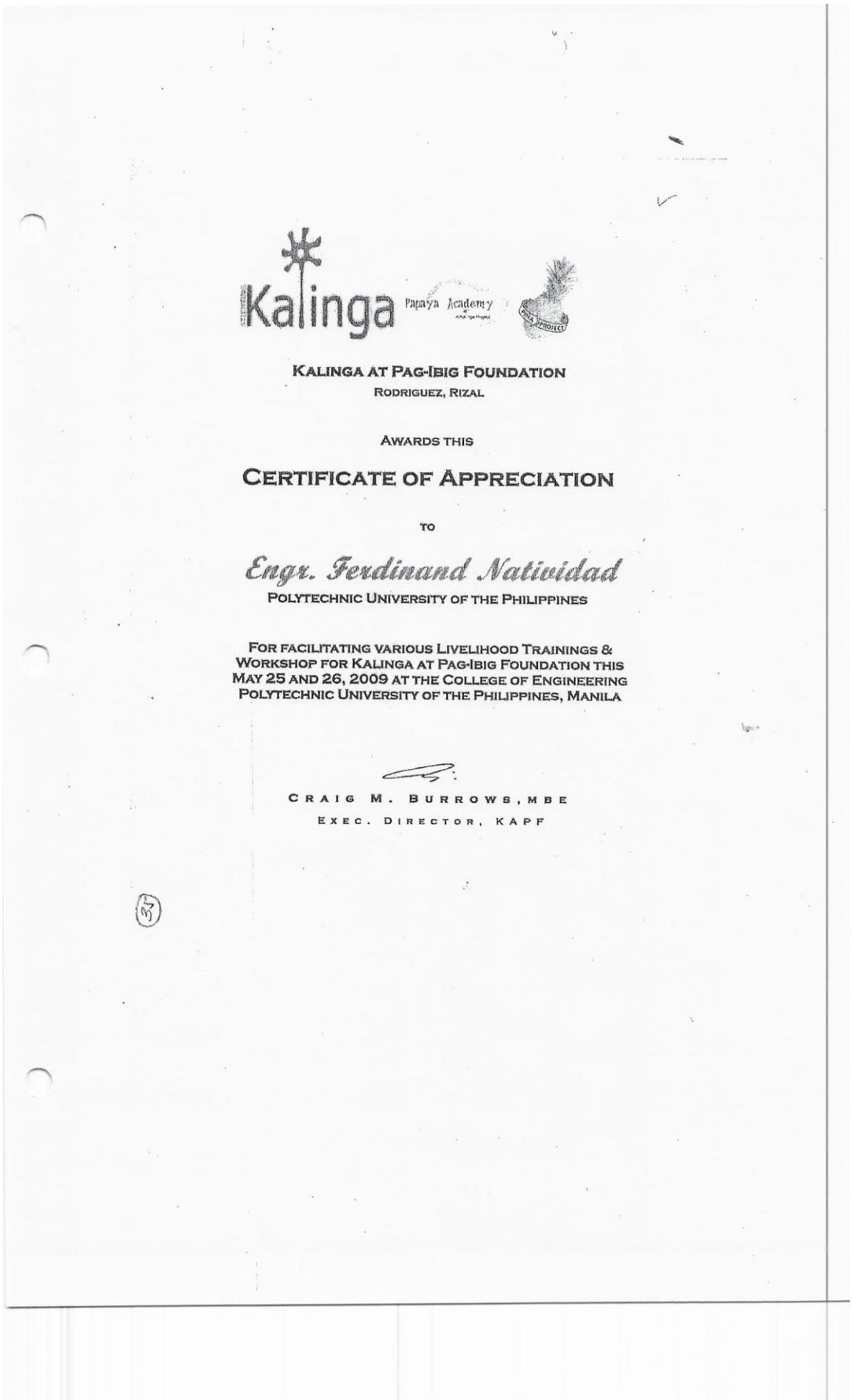
Amado G. Suarez
Coordinator
Community Extension Service Unit

Henry G. Magat
Director
Student Affairs and Community Services

Rossana T. Adao
Director
Information Technology Education Department

Dr. May Rose C. Imperial
Senior Director for Academic Affairs

Benson T. Tan
Executive Director



Kalinga Papaya Academy

KALINGA AT PAG-IBIG FOUNDATION
RODRIGUEZ, RIZAL

AWARDS THIS

CERTIFICATE OF APPRECIATION

TO

Engr. Ferdinand Natividad
POLYTECHNIC UNIVERSITY OF THE PHILIPPINES

FOR FACILITATING VARIOUS LIVELIHOOD TRAININGS & WORKSHOP FOR KALINGA AT PAG-IBIG FOUNDATION THIS MAY 25 AND 26, 2009 AT THE COLLEGE OF ENGINEERING POLYTECHNIC UNIVERSITY OF THE PHILIPPINES, MANILA

CRAIG M. BURROWS, MBE
EXEC. DIRECTOR, KAPF

(02) 8713 5968 | dcoe_chair@gmail.com
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ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
MANILA 1904

ROTARY INTERNATIONAL

CERTIFICATE OF RECOGNITION

This certificate is awarded to

Engr. Ferdinand O. Natividad

In recognition of his invaluable contribution to the successful conduct of the "PUP College of Engineering-Rotary Club of Uptown Novaliches Summer Workshop" for less fortunate people and out-of-school youth.

Given this 29th day of April in the year of Our Lord two thousand and nine at the College of Engineering, NDC Compound, Polytechnic University of the Philippines, Sta. Mesa, Manila.

COLLEGE OF ENGINEERING
POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
MANILA

Dr. Manuel M. Muhi
Dean, College of Engineering

Ms. Erlinda D. Elequin
President, RUCN

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ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

PA I-1

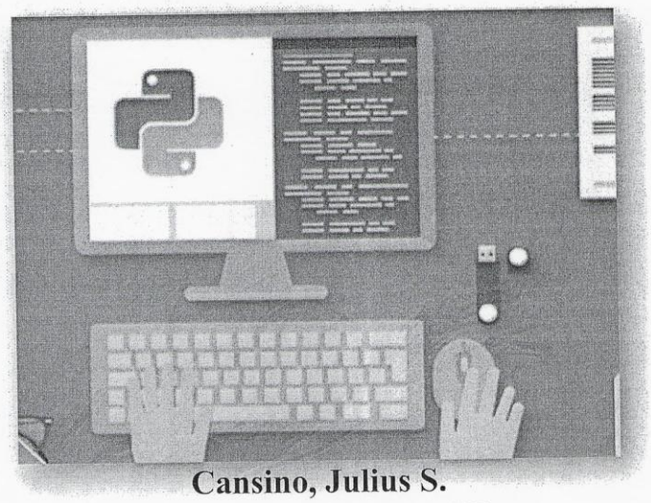
Fundamentals of Programming

Introduction to Programming Course for Non-CpE Students

First Edition

Engr. Julius S. Cansino
Engr. Joshua Benjamin B. Rodriguez
Engr. Pedrito M. Tenerife Jr.
Engr. Rolito L. Mahaguay
Engr. Julian Lorico Jr.
Dr. Antonio Y. Velasco

Programming Logic and Design for Computer Engineering



Cansino, Julius S.
Tenerife, Pedrito Jr., M.
Rodriguez, Joshua Benjamin B.

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
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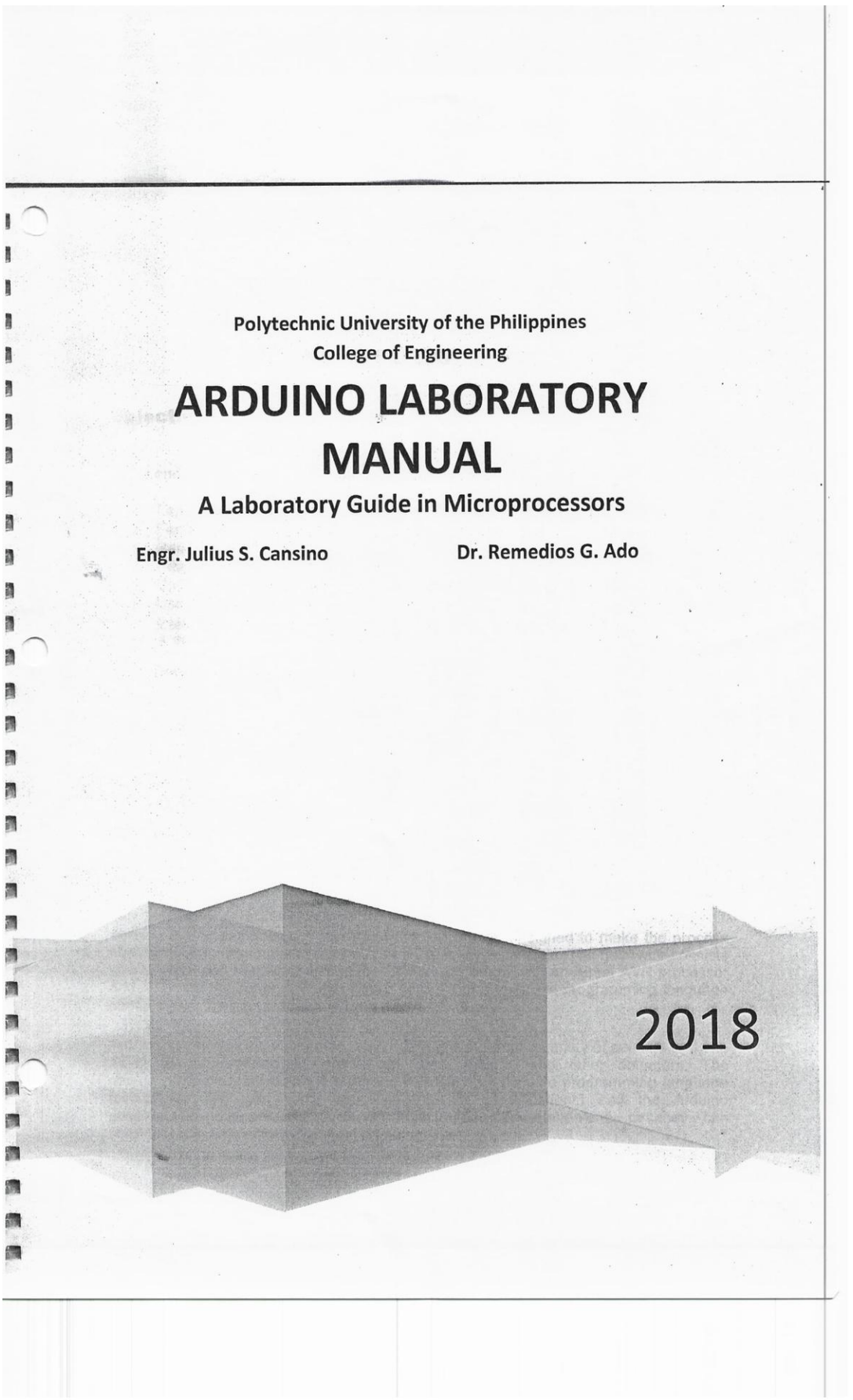

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RM322 CEA BLDG. NDC COMPOUND,
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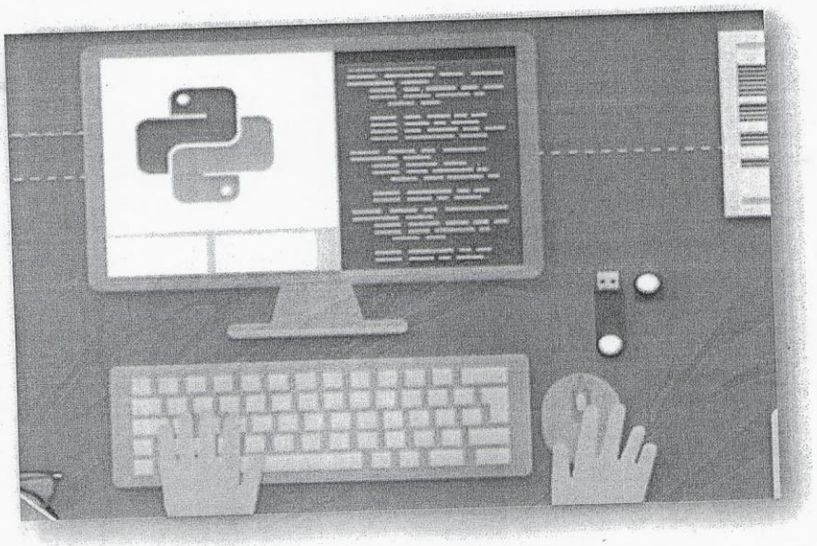
PROGRAMMING LOGIC AND DESIGN LAB MANUAL IN PYTHON



Engr. Julius S. Cansino
Engr. Pedrito M. Tenerife Jr.
Engr. Joshua Benjamin B. Rodriguez
2019 Edition

LABORATORY MANUAL IN OPERATING SYSTEM

First Edition

By

Engr. Julius S. Cansino
Engr. Florinda H. Oquindo
Engr. Orlando V. Pajabera
Engr. Pedrito M. Tenerife Jr.

Republic of the Philippines
POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
Office of the Executive Vice President
OPEN UNIVERSITY

The Country's 1st PolytechnicU

January 29, 2014

CERTIFICATION

This certifies that **PROF. REMEDIOS G. ADO** and **PROF. ANNETTE M. RAFAEL** developed the Module on Project Management Information System for the Master of Science in Information Technology (MSIT) students in the Open University.

This certification is issued to Prof. Ado for whatever legal purposes it may serve.

CARMENCITA L. CASTOLO, DEM
Director

4th Floor Ninoy Aquino Library and Learning Resource Center A. Mabini Campus Anonas Street, Sta. Mesa, Manila
Phone: (Direct Line) 713-1505 (Trunk Line) 7167832 local 251 website: www.pup.edu.ph e-mail: ou@pup.edu.ph

PA 1
I.4

I.1. The faculty demonstrate professional competence and are engaged in any or a combination of the following:

I.1.4. production

Documents attached:

- FUNDAMENTALS OF PROGRAMMING
- PROGRAMMING LOGIC AND DESIGN FOR COMPUTER ENGINEERING
- ARDUINO LABORATORY MANUAL
- PROGRAMMING LOGIC AND DESIGN LAB MANUAL IN PYTHON
- LABORATORY MANUAL IN OPERATING SYSTEM
- PROJECT MANAGEMENT INFORMATION SYSTEM FOR THE MASTER OF SCIENCE IN IT

I.1.5

I.1. The faculty demonstrate professional competence and are engaged in any or a combination of the following:

I.1.5. consultancy and expert service; and

Documents attached:

- CERTIFICATE IN AN EXTENSION SERVICE
- CERTIFICATE AS AN ADVISORY COUNCIL
- CERTIFICATE AS JUDGE IN A COMPETITION
- CERTIFICATE IN A PANEL MEMBER
- CERTIFICATE AS COACH
- CERTIFICATE AS ACCREDITOR
- CERTIFICATE AS TECHNICAL WORKING GROUP

Certificate in an Extension Service

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
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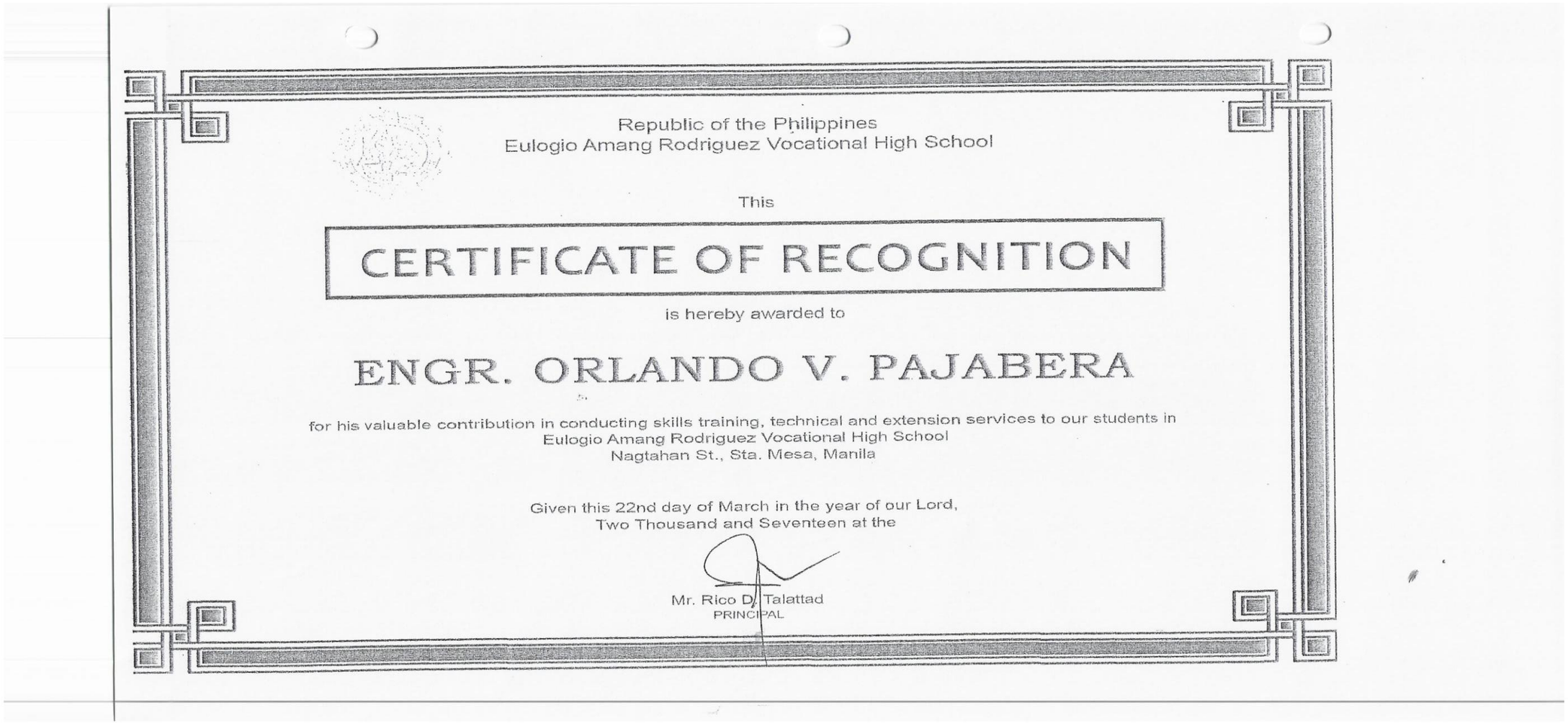

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PRINCIPAL

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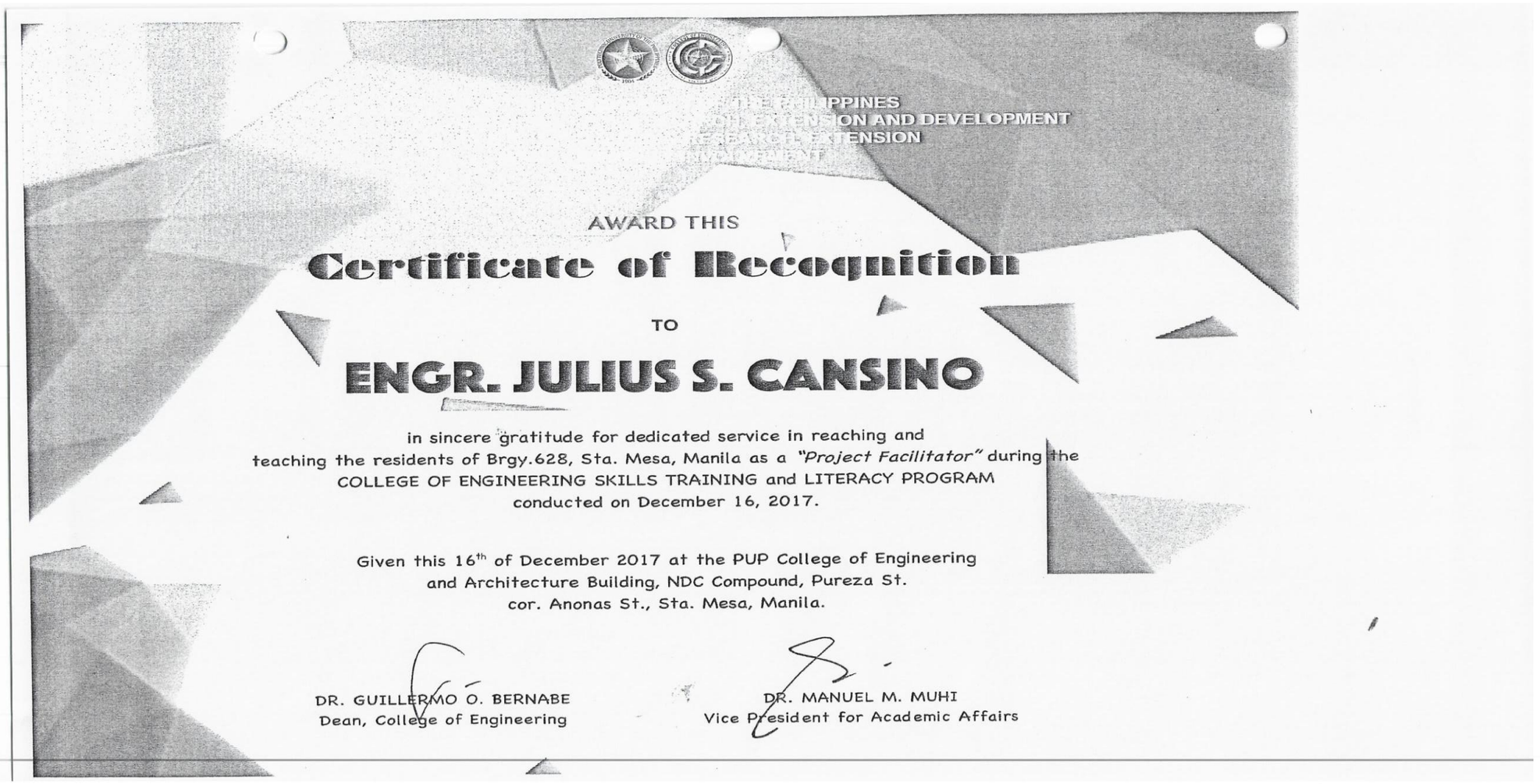

THE PHILIPPINES
ON AND DEVELOPMENT
EXTENSION

AWARD THIS

Certificate of Recognition

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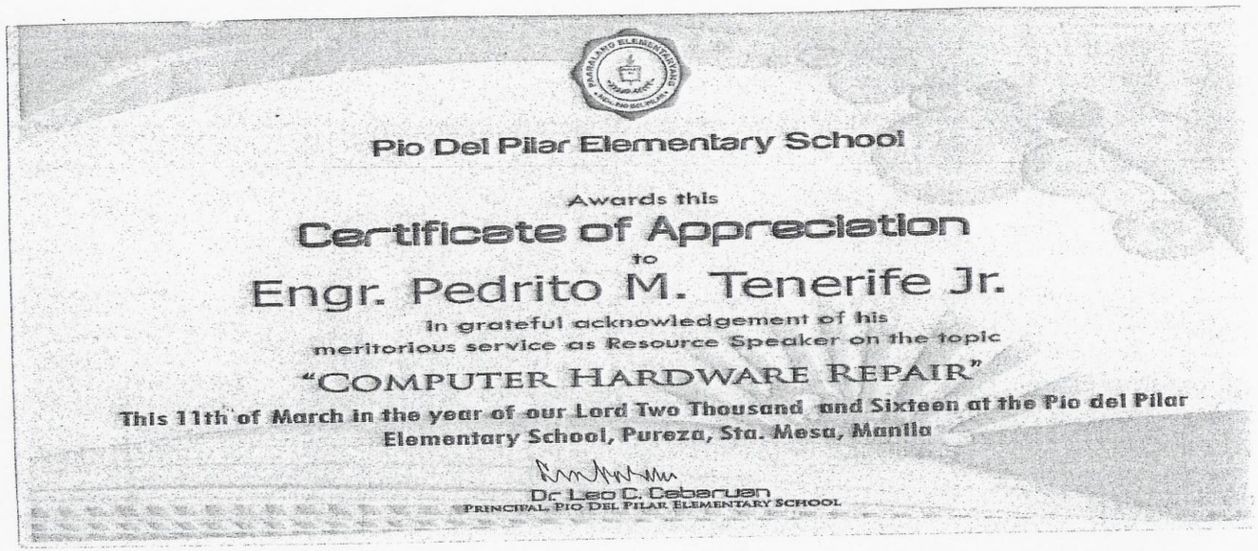

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PRINCIPAL, PIO DEL PILAR ELEMENTARY SCHOOL

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Rotary International

District 3780
ROTARY CLUB OF UPTOWN NOVALICHES

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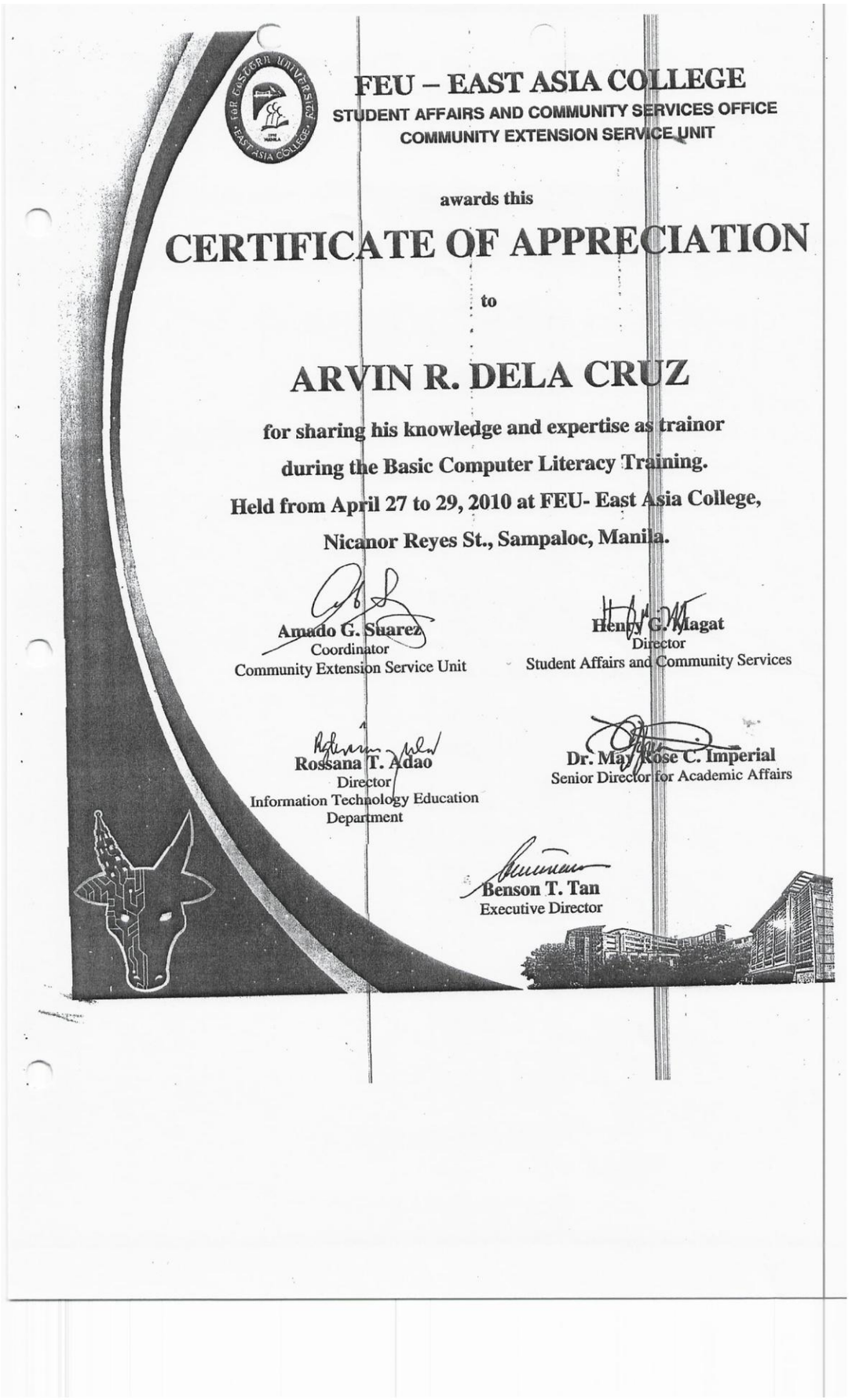

FEU – EAST ASIA COLLEGE
STUDENT AFFAIRS AND COMMUNITY SERVICES OFFICE
COMMUNITY EXTENSION SERVICE UNIT

awards this

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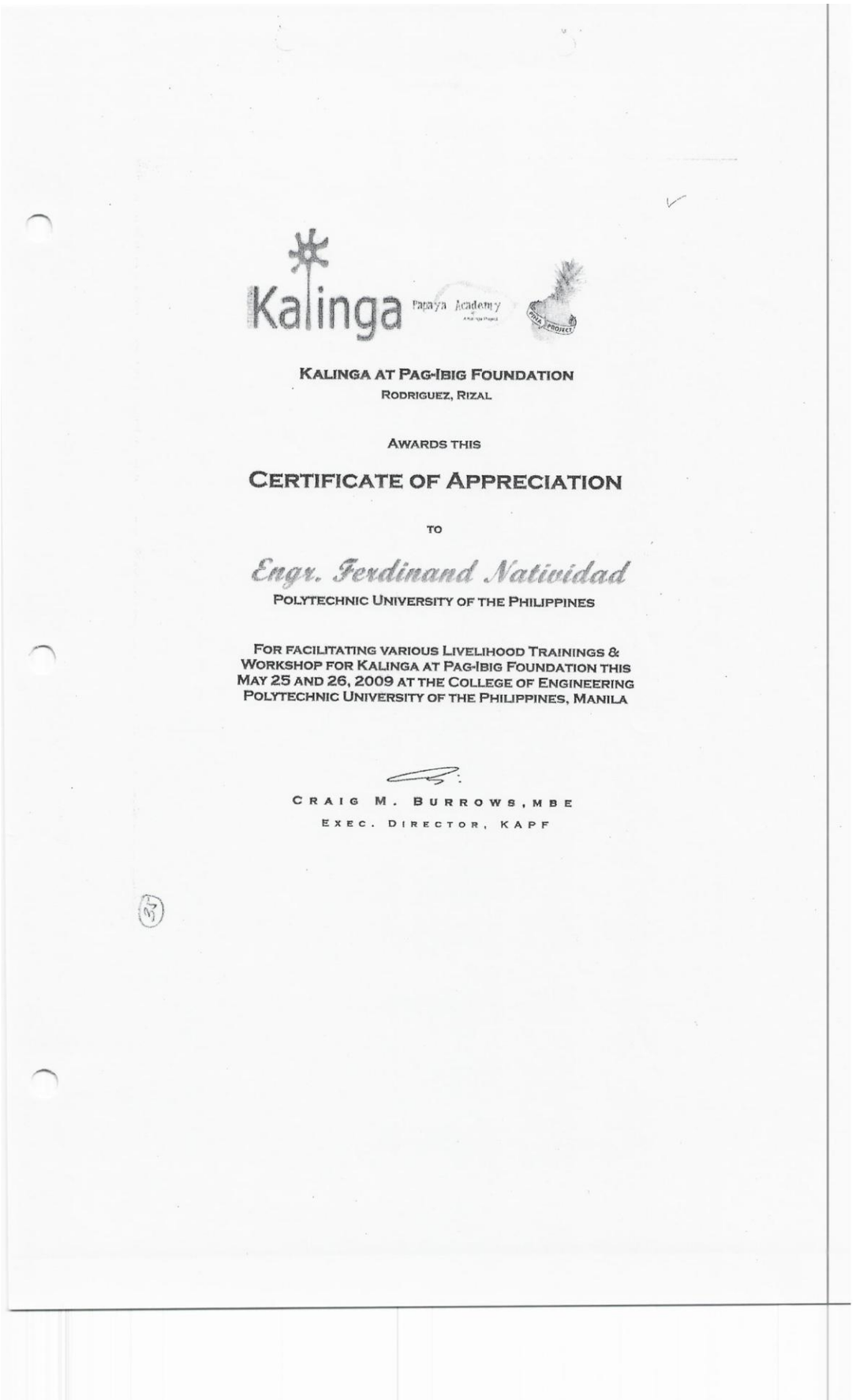

Kalinga Pagaya Academy

KALINGA AT PAG-IBIG FOUNDATION
RODRIGUEZ, RIZAL

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Dean, College of Engineering

Ms. Erlinda D. Elequin
President, RUCN

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

Certificate as an Advisory Council

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

Republic of the Philippines
National Police Commission
PHILIPPINE NATIONAL POLICE
COMMUNICATIONS AND ELECTRONICS SERVICE
Camp Crame, Quezon City

PROF. PEDRITO M. TENERIFE JR.
Chairperson
Computer Engineering Department
Polytechnic University of the Philippines

Dear Professor Tenerife:

Greetings!

In furtherance of Philippine National Police's journey towards the institutionalization of Performance Governance System (P.G.S) through the PNP P.A.T.R.O.L Plan 2030, the Communications & Electronics Service is now establishing its own functional Advisory Council by inviting general stakeholders community partners including experts or specialists in the field of Communications and Electronics in the various sectors that will serve as our advisers in the realization of our Unit's Strategy as incorporated in our CES P.A.T.R.OL Plan 2020.

In this regard, we are respectfully seeking for your permission to be an honorable member of our Advisory Council, together with other stakeholders in advocating genuine reform in the PNP.

Should you have any concerns or need some clarifications regarding this matter, please feel free to coordinate with PCINSP ROBERT H. CAMPO thru telephone number 721-8830 and mobile number 0917-7920383 or PSI ROMEO ALLAN C. TANG with mobile number 0915-9522924.

Thank you and best regards!

Very truly yours,

RODEL DUTERTE CALUNGSUD
Police Chief Superintendent
Director

Republic of the Philippines
POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

June 25, 2014

Rodel Duterte Calungsud
Police Chier Superintendent
Director
Camp Crame, Quezon City

Sir:

Greetings!

In response to your invitation for the establishment of a Functional Advisory system to aid in the institutionalization of your agency's Performance Governance System, I am honoured and willing to assist you in fulfilling this endeavour. In this regard, may I request for the complete details of the said activity so I could make the necessary arrangements with my superior concerning my tasks in our institution for that day.

Should you have any inquiries you may contact me thru telephone number (02)7135968 / 09284206958 or at pmtenerife@pup.edu.ph.

I am looking forward to be of help to you.

Very truly yours,

Engr. Pedrito M. Tenerife Jr.
Chairperson

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

Republic of the Philippines
National Police Commission
PHILIPPINE NATIONAL POLICE
COMMUNICATIONS AND ELECTRONICS SERVICE
Camp Crame, Quezon City

July 30, 2014

PROF. PEDRITO M. TENERIFE JR.
PUP College of Engineering
CEA Building, NDC Campus
Sta. Mesa, Manila, Philippines 01008

Dear Professor Tenerife:

Greetings!

The PNP Communications & Electronics Service is very much delighted of your acceptance to become part of the PNPCES Multi-Sectoral Governance Council will be officially named as the "PNPCES Advisory Group for Police Reform and Development" and as our partners in advocating genuine reform in the PNP.

In this regard, may we respectfully invite you for the oath-taking ceremony of PNPCES Advisory Group on August 06, 2014, 3:00 P.M. at the CES Function Hall, CES Headquarters, Philippine National Police, Camp Crame, Quezon City.

Should you have any concerns or need some clarifications regarding this matter, please feel free to coordinate with PCINSP ROBERT H. CAMPO thru telephone number 721-8830 and mobile number 0917-7920383 or PSINSP ROMEO ALLAN C. TANG with mobile number 0915-9522924.

Thank you and best regards!

Very truly yours,

RODEL DUTERTE CALUNGSUD
Police Chief Superintendent
Director

Republic of the Philippines
National Police Commission
PHILIPPINE NATIONAL POLICE
COMMUNICATIONS AND ELECTRONICS SERVICE
CampCrame, Quezon City

June 27, 2016

CERTIFICATION

This is to certify that ***Professor Pedrito M. Tenerife Jr.***, is a bonafide member of the ***PNP Communications & Electronics Service Advisory Council (PNPCES-AC)*** and designated as ***Chairperson*** from *August 6, 2014* up to *present* with the following functions as follows:

a. *Advise and assist the PNPCES in identifying key priorities and strategic issues in accordance with the PNPCES Roadmap and scorecard through P.A.T.R.O.L Plan 2030;*
b. *Provide insights in aligning the PNPCES policies, plans and programs with the technical knowledge and training needs of the PNPCES;*
c. *Determine and set the agenda for Advisory Group meetings in line with the concerns or priorities adopted by the Advisory Group and ensure that these agenda are discussed and addressed;*
d. *Preside over Advisory Group meetings;*
e. *Responsible in coordinating the Advisory Group's interests with the PNPCES governing body (Command Group); and*
f. *Represent the Advisory Group at functions and proceedings*

This certification is being issued to above-mentioned Advisory Council Member for whatever legal purpose it may serve him best.

Signed this 29th day of June 2016 at PNPCES HQs, Camp Crame, Quezon City Philippines.

ROBERT G PO
Police Chief Superintendent
Director, PNPCES

SCHOOLS DIVISION OFFICE - MARIKINA CITY BOARD - NCR
Discipline • Good Taste • Excellence
• 1998 •

TECHNOLYMPICS 2016

"Enhancing Showmanship, Creativity and Skills in Technical-Vocational Education Through K-12 Program."

DepED K12 Tayo PARA SA EDUKASYON

Republic of the Philippines
Department of Education
National Capital Region

DIVISION OF CITY SCHOOLS MARIKINA

This

Certificate of Appreciation

is awarded to

Julian L. Lorico

in grateful acknowledgment and appreciation for providing and imparting essential points in the evaluation of participants in Web Page Designing Category during the
2016 DIVISION TECHNOLYMPICS
held in International Electronics and Technical Institute (IETI), Sta. Elena, Marikina City on January 14, 2016.

Given this 14th day of January in the Year of our Lord, Two Thousand and Sixteen at IETI, Sta. Elena, Marikina City.

HELEN GRACE V. GO
Officer In-Charge
Office of the Schools Division Superintendent

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

Certificate as Judge in a Competition

(02) 8713 5968 | dcoe_chair@gmail.com
RM322 CEA BLDG. NDC COMPOUND,
ANONAS COR. PUREZA STREETS, STA. MESA, MANILA

COLLEGE OF ENGINEERING@37, THE GENESIS OF THE COLOSSAL PURSUIT FOR ENGINEERING EXCELLENCE

ENGINEERING WEEK
EPISODE MMXVI

POLYTECHNIC UNIVERSITY OF THE PHILIPPINES
COLLEGE OF ENGINEERING
COLLEGE OF ENGINEERING STUDENT COUNCIL

presents this

CERTIFICATE OF APPRECIATION

to

ENGR. JULIAN L. LORICO Jr.

for sharing his expertise as the

CHAIRMAN OF THE PANEL OF JUDGES

of the

INFORMATION TECHNOLOGY QUIZ SHOW

Given during the 37th College of Engineering Week-long Founding Celebration held on February 15-20, 2016 at the College of Engineering and Architecture Building, NDC Compound, Sta Mesa, Manila.

BRANDON MARK BRUTAS
Chairman Academic, Literary, & Speech Competitions

JUAN CARLO R. ORICA
Chairman
Engineering Week 2016

JOY MAE D. CHAVEZ
President
College of Engineering Student Council

ENGR. GUILLERMO O. BERNABE
Dean
College of Engineering

EMANUEL C. DE GUZMAN, PhD
President
Polytechnic University of the Philippines

FEBRUARY 15 - 20, 2016

DepED
DEPARTMENT OF EDUCATION
National Capital Region
SCHOOLS DIVISION OFFICE
Marikina City

DIVISION OF CITY SCHOOLS
MARIKINA
Shoe Ave., Sta. Elena, Marikina City

RELEASED
JAN 13 2016
RECORDS UNIT

January 6, 2016

Mr. PEDRITO M. TENERIFE JR.
Chairperson
Computer Engineering Department
Polytechnic University of the Philippines

Sir:

Greetings from the division of Marikina City!

DepEd Marikina will conduct the **2016 Division Technolympics** with the theme *"Enhancing Showmanship, Creativity, and Skills in Technical-Vocational Education through K-12 Program"* on **January 14, 2016** at IETI Marikina City.

The event aims to provide opportunities for students to showcase their marketable products and performances in different skills acquired in their respective specializations in Technology and Livelihood Education (TLE) and Technical Vocational Education.

Knowing that your prestigious institution has qualified and competent employees in the field of Information Technology, may we invite three experts on the following areas as judges during the said event:

1. Web Designing
2. Tarpaulin Designing
3. PC Assembly with network configuration

For inquiries, you may call the contest administrator Mr. Cecilio S. Volante III, Teacher, Marikina Science High School at 369-74-88 or Mr. Joseph T. Santos, Education Program Supervisor at 682-39-89.

We look forward for your favorable response on this matter.

God bless and more power!

Very truly yours,

HELEN GRACE V. GO
Officer-in-Charge
Office of the Schools Division Superintendent

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Republic of the Philippines
Department of Education
National Capital Region

DIVISION OF CITY SCHOOLS MARIKINA

This

Certificate of Appreciation

is awarded to

Rolito L. Mahaguay

in grateful acknowledgment and appreciation for providing and imparting essential points in the evaluation of participants in Tarpaulin Designing Category during the
2016 DIVISION TECHNOLYMPICS
held in International Electronics and Technical Institute (IETI), Sta. Elena, Marikina City on January 14, 2016.

Given this 14th day of January in the Year of our Lord, Two Thousand and Sixteen at IETI, Sta. Elena, Marikina City.

HELEN GRACE V. GO
Officer In-Charge
Office of the Schools Division Superintendent

International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878, Volume-8, Issue-1S4, June 2019

Design and Development of Banana Fiber Decorticator with Wringer

Pedrito M. Tenerife Jr., Arvin R. De La Cruz, Alexis Christellene M. Arce, Ma. Arianne N. Pabularcon, Kathleen Meriel D. Ortega, Ralph Lorenz R. Rafallo

Abstract*— The demand for fiber as raw materials to make various products is increasing. It can be extracted from the seed, leaves, fruits and stem of a plant. Banana is one of the leading fruits grown in the Philippines. It provides food and a source of industrial raw materials. Aside from the fruit, banana blossom and its trunk pith that can be eaten, natural fiber can be extracted in the trunk (pseudo-stem) that is usually thrown as waste after the harvest season. The study aims to develop a machine that can extract fiber in a pseudo-stem which can be used in handicrafts, ropes, clothing and other products. A prototype was designed, developed and was tested for banana trunk fiber extraction. During the extraction process, the stem which is 45.72 cm in length and 1 cm thickness is fed manually in the prototype machine. Fiber is extracted from the pseudo-stem using a decortication process where a roller with scratched surface is compressed into a stationary bar that will crushed and scraped the trunk. During the decortication process the banana stem is also undergoing the wringing process wherein the fiber loses its water content. The extracted fiber is already dried and can be used in making domestic products. However, to have a good quality fiber, after the process, it should be washed and dried. Results indicated that the recovery rate of the banana fiber has increase by 2-3% in an average of 35.5 cm pseudo-stem. The device has a great potential and should be used for the growing fiber industry in the country.

***Index Terms*— bast fiber, decortication process , pseudo stem, wringing process**

I. INTRODUCTION

The demands for the use of natural fibers to produce clothes, carpets and other handicraft products have grown tremendously. Various plants are used as a source material for fiber to meet the demands. It is extracted from fruits, stem, and leaves of various plants. In the Philippines, a natural source of fiber is coconut, water hyacinth, pineapple, abaca. A lot of attention has been given to these plants. However, banana (*Musa sapientum*) which resembles and closely related to abaca (*Musa textilis*) is also a good source of fiber.

Philippines is one of the largest producers of banana in the world. Also, banana is the fourth largest commodity that is being produced in the Philippines next to paddy rice, coconuts and native pig meat. With the large scale of banana that is being harvested means that there a lot of banana stems that can be used to produce banana fiber and help local banana farmers for their livelihood.

II. BANANA FIBER CHARACTERISTICS AND PRODUCTS

Physical Properties

Banana fiber has good modulus of elasticity, tensile strength, and stiffness [8].

Other characteristics includes [2]:

- Appearance of banana fiber is like that of bamboo fiber and ramie fiber, but its fineness and spinnability is better than the two.
- The chemical composition of banana fiber is cellulose, hemicellulose, and lignin.
- It is highly strong fiber.
- It has smaller elongation.
- It has somewhat shiny appearance depending upon the extraction & spinning process.
- It is light weight.
- It has strong moisture absorption quality. It absorbs as well as releases moisture very fast.
- It is bio- degradable and has no negative effect on environment and thus can be categorized as eco-friendly fiber.
- Its average fineness is 2400Nm.
- It can be spun through almost all the methods of spinning including ring spinning, open-end spinning, bast fiber spinning, and semi-worsted spinning among others.

Chemical Composition

The chemical composition of banana fiber is cellulose (50-60%), hemicelluloses (2530%), pectin (3-5%), lignin (12-18%), water soluble materials (2-3%), fat and wax (35%) and ash (1-1.5%) [7].

Products

Because of it being biodegradable, banana fiber is use in different products like yarn, fabric, apparel, paper and paper made products, handicrafts and industrial purposes [9].

As stated by Mr. Romeo O. Bordeos Jr. global competitiveness of the Philippine natural fibers depend on the accuracy of classification and grading of fibers produced [1].

III. PROTOTYPE DEVELOMENT

The prototype uses the concept of auto feed system. It consists of keypad, LCD display, rollers, containers,

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emergency stop and conveyor. Keypad was the component used to control the whole system. The numbers in the keypad corresponds to the following tasks: (1) Automatic, (2) Manual, (3) Motor (On), (4) Motor (Off), (5) Conveyor (On), (6) Conveyor (Off). Banana pseudo stem is fed into the prototype. The roller, serves as decorticator and wringer at the same time, was used in stripping the medium. It undergoes adjustments depending on the size of the medium to be fed. The decorticated banana pseudo stem will then fell onto the conveyor. Excess water of decorticated banana pseudo stem that falls in the water container is monitored by a water level sensor. The conveyor brings the decorticated pseudo stem into the output container. All components are connected to a micro-controller unit. The Liquid Crystal Display (LCD) is used for the monitoring the current stage of the process.

Block Diagram

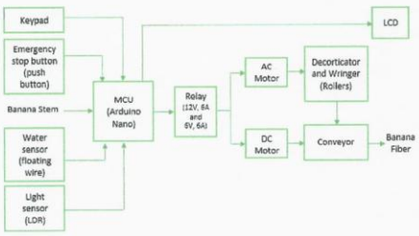

Fig. 1 Block Diagram

Fig. 1 shows how the prototype components are connected. The machine is controlled by a microcontroller Arduino Nano. It has an option whether automatic or manual (user operated). Once a banana stem is placed into the machine and the photoresistor (LDR) sensed it his will turn on the whole machine. The decorticator and wringer are powered by an AC motor to extract the banana fiber. The extracted fiber will go onto a conveyor belt and transferred on a bucket. The extracted water from the stem goes in a container monitored by a sensor. Warning and status of the system is displayed on the LCD. An emergency stop button is included to turn off the whole system once needed. The banana fiber extracted will be dried under the sun.

IV. EXTRACTION MACHINE

Major components of machine are roller, motor, conveyor, and the display. Fig 2a and 2b shows the actual machine.

Fig 2a Decorticating and conveyor

Fig 2b Display

V. TEST RESULTS AND DISCUSSION

For initial testing of the prototype, the proponents used a constant motor speed, and length and thickness of the stem to determine the exact distance of the two rollers needed to achieve the highest fiber recovery range.

Table I. Initial Testing

Length of the stem	Thickness of the stem	Motor Speed	Distance of two rollers	Fiber recovery rate
45.72 cm	1 cm	2800 rpm	8 mm	No fiber recovered.
45.72 cm	1 cm	2800 rpm	7.62 mm	0.01% - 0.05%
45.72 cm	1 cm	2800 rpm	7.112 mm	0.1% - 0.3%

After the initial testing, it was observed that it can decorticate and wring but there was a problem with the motor because it stops in the middle of the process. The motor that was used doesn't have enough torque to drive the rollers continuously. The solution is to add another motor to increase the torque.

Table II. Final Testing

Length of the stem	Thickness of the stem	Motor Speed	Distance of two rollers	Recovery rate

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35.5 cm	1 cm	2800 rpm (2)	7.0 mm	Fiber recovered. 0.4% - 0.5%
35.5 cm	1 cm	2800 rpm (2)	6.5 mm	Fiber recovered. 0.6% - 0.7%
35.5 cm	1 cm	2800 rpm (2)	5.2 mm	Fiber recovered. 0.8% - 1.0%.
35.5 cm	1 cm	2800 rpm (2)	4.0 mm	Fiber recovered. 0.1.5% - 2.5%

The final test results show that the roller should be 4mm apart from each other and 2 motors are needed to extract the fibers from the stem.

VI. CONCLUSION

The developed Banana Fiber Decorticator with Wringer is efficient. By giving attention to the motor speed and the distance of the roller there is an increase in the production rate of the banana fiber. The application of the conveyor and feeder reduces the time and effort of the user.

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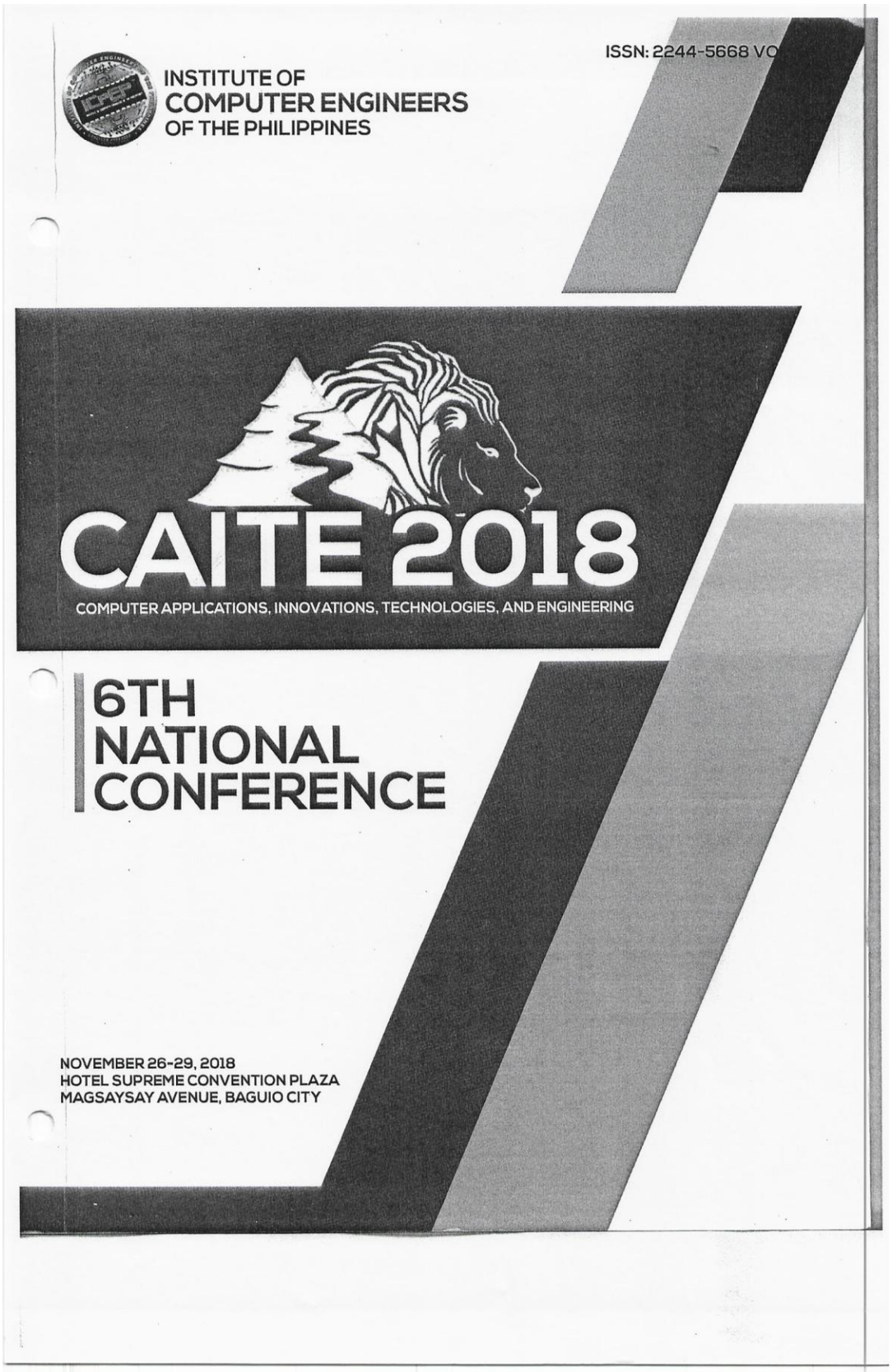

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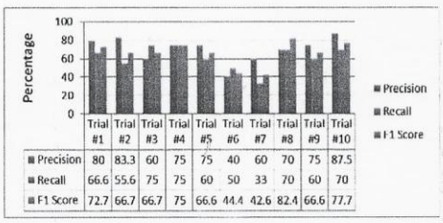
A. F1 Score

The performance of the system was tested using confusion matrix. Values obtained from confusion matrix were used in the computation of F1-score, precision and recall.

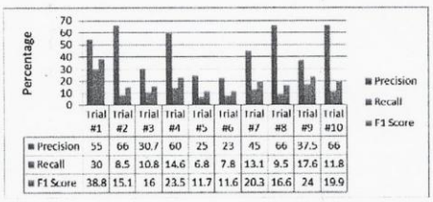
Figure 2 and Figure 3 shows the graphical representation of the system performance of identifying Dunaliella sp. and Chlorella sp., and the computed percentage of precision, recall and f1-score in each trial.

In Figure 2, precision, recall and f1-score does not differ significantly in each trial for Dunaliella sp. Since the system outputs a high precision and recall and the percentages reaches above 50%, the classifier for Dunaliella sp. returns a relevant result.



	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6	Trial #7	Trial #8	Trial #9	Trial #10
Precision	80	83.3	60	75	75	40	60	70	75	87.5
Recall	66.6	55.6	75	75	60	50	33	70	60	70
F1 Score	72.7	66.7	66.7	75	66.6	44.4	42.6	82.4	66.6	77.7

Fig. 2 A sample of the System Performance for Dunaliella sp.



	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6	Trial #7	Trial #8	Trial #9	Trial #10
Precision	55	66	30.7	60	25	23	45	66	37.5	66
Recall	30	8.5	10.8	14.6	6.8	7.8	13.1	9.5	17.6	11.8
F1 Score	38.8	15.1	16	23.5	11.7	11.6	20.3	16.6	24	19.9

Fig. 3 A sample of the System Performance for Chlorella sp.

Figure 3 shows that the percentage of precision and recall for Chlorella sp. differs significantly in each trial. High ratio of precision and low ratio of recall means a low f1-score. Also, compared to Dunaliella sp. most of the trials for Chlorella sp. yields a percentage below 50%, hence, it means that the system has low performance when it comes to recognizing Chlorella sp.

B. T-Test

Results produced by the system were compared to results done in manual counting. The following table below shows the result of t-Test between the means of the manual and automated cell count.

t-Test was used to compare the means of the manual and automated process of the system, and to test the null microalgae cells t-test is 0.05.

As shown in Table 1, the computed p-value=0.61437903 is greater than the alpha level, therefore, null hypotheis cannot be rejected and the difference between the sample means of manual and automated process for Dunaliella sp. do not differ significantly.

TABLE I
T-TEST BETWEEN the MEANS of AUTOMATED and MANUAL CELL COUNT for DUNALIELLA SP.

	Automated	Actual
Mean	86.8	83.4
Variance	145.2	62.8
df	7	
t Stat	0.52714762	
P(T<=t) one-tail	0.30718951	
t Critical one-tail	1.8945786	
P(T<=t) two-tail	0.61437903	
t Critical two-tail	2.36462425	

While in Table 2 shows that the computed p-value=0.003293807 of Chlorella sp. t-test is less than the alpha level, hence null hypothesis rejected. This means that the difference between the samples means of manual and automated process differs significantly.

TABLE III
T-TEST BETWEEN the MEANS of AUTOMATED and MANUAL CELL COUNT for CHLORELLA SP.

	Automated	Actual
Mean	499.4	589.8
Variance	1526.8	617.7
df	7	
t Stat	-4.365061906	
P(T<=t) one-tail	0.001646903	
t Critical one-tail	1.894578604	
P(T<=t) two-tail	0.003293807	
t Critical two-tail	2.364624251	

V. CONCLUSION

Based from the analyzed and computed results shown in the table and graphs, the proponents concluded that the system was indeed effective, that there was no significant difference between the manual and automated counting and can be utilized as an alternative for manual counting.

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Optical character reader of a braille unicode system for the blind (Article)

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Department of Computer Engineering, College of Engineering Polytechnic University of the Philippines, Sta. Mesa, Manila, Philippines

Abstract

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--This study aspires to innovate braille system by applying the fast coping technological advancement of the world to it. Braille is a code -- a system of dots that represents the letters of the alphabet and that visually impaired individuals can use to read independently. As Braille Technology is fast growing, more and more people with visual impairment cannot afford to bought one. Thus, the proponents created a prototype, a portable and a lot cheaper braille device that will help individuals and institutions for their reading challenges. The proponents created a braille display that comes up with a scanner that will scan physical text documents then process it to become an output as a braille cell. It also comes up with a text-to-speech conversion which will become an option for the involved person on what will he or she chooses as an output. This is made possible by Optical Character Recognition (OCR) technology that the proponents used in Raspberry Pi. The OCR is responsible for the image processing that will convert the image captured into a text file. The text file will then be processed again to send signal to the servo motor that is responsible for pushing the braille cells needed. The device also includes motor guide for correct scanning of the physical text documents. The device will perform the task quickly that will surely help visually impaired individuals to easily read reading materials. This system is conducted to provide another solution on problems about reading for blind and visually impaired individuals and to provide cheaper device for them. It will contribute not only to the community involved but also in the technological industry in the Philippines. ©BEIESP.

Author keywords

Braille | Index Terms— braille | Optical Character Reader | Optical character recognition | Raspberry pi | Unicode System

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(2015) *Refreshing Refreshable Braille Displays*. Cited 2 times.

Also, the system successfully managed to achieve the objectives of the study. The researchers were able to automate the counting process using Raspberry Pi, the system was able to calculate the cell density of the sample and able to count and identify Dunaliella sp. and Chlorella sp. using image processing and Haar Cascade Algorithm. However, the system was not able to return precisely results for Chlorella sp. due to its size and difficulty of processing images because of low resolution camera.

So, the proponents recommend using a high-resolution camera to acquire better quality of images. Using an updated and higher version of microcontroller other than Raspberry Pi 3 would also be better to enhance the performance of processing.

FIGURES/CAPTIONS

The following formulas were used in the computation of precision, recall and f1-score.

$$F1\ Score = \frac{2 * (Recall * Precision)}{Recall + Precision}$$

$$Precision = \frac{True\ Positive}{True\ Positive + False\ Positve}$$

$$Recall = \frac{True\ Positive}{True\ Positve + False\ Negative}$$

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Optical Character Reader of a Braille Unicode System for the Blind

Arvin R. De La Cruz, Reginald D. Legaspi, Zildjian L. Mergilla, Marc Oliver P. Otawa

ABSTRACT--- This study aspires to innovate braille system by applying the fast coping technological advancement of the world to it. Braille is a code – a system of dots that represents the letters of the alphabet and that visually impaired individuals can use to read independently. As Braille Technology is fast growing, more and more people with visual impairment cannot afford to bought one. Thus, the proponents created a prototype, a portable and a lot cheaper braille device that will help individuals and institutions for their reading challenges. The proponents created a braille display that comes up with a scanner that will scan physical text documents then process it to become an output as a braille cell. It also comes up with a text-to-speech conversion which will become an option for the involved person on what will he or she chooses as an output. This is made possible by Optical Character Recognition (OCR) technology that the proponents used in Raspberry Pi. The OCR is responsible for the image processing that will convert the image captured into a text file. The text file will then be processed again to send signal to the servo motor that is responsible for pushing the braille cells needed. The device also includes motor guide for correct scanning of the physical text documents. The device will perform the task quickly that will surely help visually impaired individuals to easily read reading materials. This system is conducted to provide another solution on problems about reading for blind and visually impaired individuals and to provide cheaper device for them. It will contribute not only to the community involved but also in the technological industry in the Philippines.

Index Terms— braille, optical character recognition, raspberry pi, Braille, Unicode System, Optical Character Reader.

I. INTRODUCTION

Reading is always a challenge for the blind and the visually impaired where they only rely on special books and items that are limited in terms of availability and effectiveness. The blind and visually impaired does not only struggle to read books, articles, or any published materials, physically written papers and signage are just few of those that have little to no use for the blind and visually impaired to use. Their touch is the most important factor for them to read and interact with their surroundings which is why people started to invent electronic devices and applications which communicate with computers and phones in order to provide and help them in using computers and phones, although it is a solution for them to communicate it is only for digital or non-physical means only, this means they are left behind when it comes to physically written, printed or displayed words. Refreshable braille displays are currently available on the market this day. These displays are mostly used in computers to output a text, which means it is only limited to display computerized text. The braille system uses six dots to represent a certain character. Therefore, there will be two (the possible states of the dots, on/off) raise to the power of six (the number of dots) combinations which is equivalent to 64. Therefore, a braille system with 6 dots is capable of displaying 64 different characters. Optical Character Recognition is a technology that is widely used nowadays in various fields. Optical Character Recognition, or OCR, is a technology that enables you to convert different types of documents, such as scanned paper documents, PDF files or images captured by a digital camera into editable and searchable data.

The proponents would like to use this technology to develop a system that will be able to recognize texts from the outside world, and project those texts using a braille display. Blind and visually impaired individual needs to have a proper education just like us. But in our current society, they are rapidly left behind by the rapid growth of education system. Admit it or not, people with disability, especially blind individual can't cope on a normal education system that we have today. It is not because of their thinking capability, it is because it's hard for them to use and apply materials that students use on schools, especially in reading. Maybe there are some who can overcome that obstacle with the help of available Braille devices in the market but, there are many also who are left behind. So the big question is was it enough given that there are many children who are in need of a device that will help them to study? As a solution to that, the proponents want to develop an Optical Character Reader of a Braille Unicode System for the Blind to help them easily read printed materials that will become the first step in making their study patterns easy. It will also serve as the first step in the development of technology in the field of Braille devices and hopefully, the time will come that there are no more visually impaired individual that will be left behind in this society where disability is a disease and education is most important.

II. METHODOLOGY

A. Method of Research

Revised Manuscript Received on June 10, 2019.

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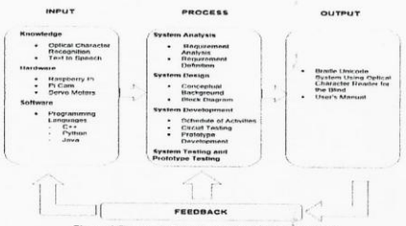

Figure 1 Research Paradigm of the Project proposal

To improve human conditions of visually impaired persons, the proponents used applied and developmental research. As an applied and developmental research study, it focuses to solve practical problems that will improve human conditions rather than to acquire knowledge. It focuses on analysis and solving social and real-life problems and generally conducted on a large-scale basis. It uses some part of the research communities' accumulated theories, knowledge, and methods. It is used to find solutions to everyday problems, and develop innovative technologies, rather than to acquire knowledge for knowledge's sake. Once an applied research has identified a workable solution to a specific problem the focus shifts to development of a specific product that involves refining the solution to produce a substance that will be effective, safe and appealing and can be manufactured in a timely and cost-effective way.

B. Data Gathering Procedure

Permission to conduct the research will be secured by the proponents from the administrator of the ATRIEV where questionnaires will be distributed to the chosen sample of the institution. The questionnaire will be scored, tallied and tabulated. The proponents and instructors of the institution will guide the persons involved for answering the given questionnaires.

III. RESULTS AND DISCUSSION

a. Functionality testing for Optical Character Recognition

Functionality Testing	First Testing	Second Testing	Third Testing	Fourth Testing
• OCR using Raspberry Pi and Pi Cam	Approximate image to text conversion accuracy is 30%	Approximate image to text conversion accuracy is 50%	Approximate image to text conversion accuracy is 60%	Approximate image to text conversion accuracy is 55%
	Fifth Testing	**Sixth Testing**	**Seventh Testing**	**Final Testing**
	Approximate converted image accuracy is 55%	Approximate image to text conversion accuracy is 70%	Approximate image to text conversion accuracy is 80%	Approximate image to text conversion accuracy is 90%

Table 1 shows the functionality of the OCR with a total of 8 testing done. The results are approximately computed based on the factors that are used during the testing period.

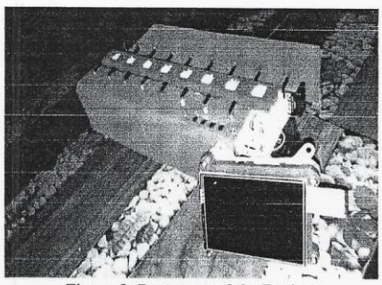

Figure 2. Prototype of the Project

Figure 2 shows the prototype of the project that showcases the braille system and the OCR and Camera that will store all the scanned documents. The device uses an 8 megapixels Raspberry Pi Cam that is installed to the Raspberry Pi, this makes it possible for the user to scan physical texts from documents or printed materials, then it will be processed by the Raspberry Pi. The scanned image undergoes Optical Character Recognition whereas the output is a text file containing all the converted data from the image. The Raspberry Pi then reads this text file and converts it to Braille ASCII, this text file is also read by the Raspberry Pi as an output for the text-to-speech

The Raspberry Pi checks the position of every cell of the braille by reading data from the rotary encoders which are attached to the servo motors on each cell, this position is used to determine the rotation needed for the servo motors to rotate to the correct position. The Raspberry Pi will send signals to the PWM Servo driver to rotate the servo motors for the desired angle. A wheel with magnets lined on its outside wall is driven by these servo motors along with the rotary angle sensors, these magnets attract and repel the pistons that serves as the individual dots. A rumble motor then vibrates to provide a haptic feedback to as the user navigates through the device.

As a feedback and error checking the rotary angle sensors are read again to ensure that the correct position is obtained, the rotary angle sensors are connected to a multiplexer that is then connected to the Raspberry Pi.

b. Weighted Mean (WM) and Verbal Interpretation (VI) of Students, Staffs, and IT Practitioner for Optical Character Reader of a Braille Unicode System for the Blind in terms of Accuracy

Accuracy	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
Correct characters are displayed	3.60	G	3.70	G	4.20	G	3.80	G
Converted text is complete	3.60	G	3.50	G	4.20	G	3.77	G
Word/Words are easy to understand	4.20	G	4.10	G	4.50	G	4.26	G
Overall Mean	3.77	G	3.77	G	3.90	G	3.94	G

Legend: Good(G)

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Optical character reader of a braille unicode system for the blind (Article)

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Abstract

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Table 2 shows the respondents result of the assessment. It shows the results of the developed device based on its functionality. Accuracy table shows the evaluation of the "Correct characters are displayed" with the WM of 3.50 for Students which is Good, a WM of 3.70 for the Staffs which is Good and WM of 4.20 for IT Practitioners which is Good too. "Converted text is complete" has a 3.60 WM for students and 3.50 WM for the Staffs and 4.20 WM for IT Practitioners which are both Good. "Words/Words are easy to understand has both 4.20 WM for the Students, 4.10 for Staffs, and 4.50 for IT Practitioners which indicates Good verbal interpretation. This implies that the developed device meets the functionality specification and requirements of the respondents in terms of different criteria made to be said that the device is functional.

c. Weighted Mean (WM) and Verbal Interpretation (VI) of Students and Staffs of ATRIEV, and IT Practitioner for Optical Character Reader of a Braille Unicode System for the Blind in terms of Efficiency

Efficiency	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
How long the device will last on a daily usage	3.90	G	4.00	G	4.10	G	4.00	G
Characters that the device can output at a time	3.80	G	3.80	G	3.80	G	3.80	G
Overall Mean	3.85	G	3.90	G	3.95	G	3.90	G

Legend: Good(G),

Table 3 shows the evaluation of the respondents which are Students and Staffs on Optical Character Reader of a Braille Unicode System for the Blind on the criteria of the Efficiency. It is evaluated using two (2) criteria to assess if the device can efficiently be used by the users specifically the life span of the device and the output rate of it. Efficiency evaluation table shows in terms of how long the device will last on daily basis usage, achieve a 3.90 WM with a VI of Good and 4.00 WM with a VI of Good for the staffs and a WM of 4.10 for IT Practitioners which indicates Good interpretation. Measuring the characters that the device can output at a time produced a WM of 3.80 for both Students and Staffs and IT Practitioners that indicates a Good interpretation.

This implies that students, staffs and the IT Practitioners agreed that the developed device is appropriate to use, effective and efficient based on their needs in their everyday routine and activities.

d. Weighted Mean (WM) and Verbal Interpretation (VI) of Students and Staffs of ATRIEV, and IT Practitioner for Optical Character Reader of a Braille Unicode System for the Blind in terms of Portability

Portability	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
Weight of the device	3.90	G	3.70	G	4.10	G	3.30	F
Overall size of the device	4.60	G	3.30	F	3.70	G	4.10	G
Overall Mean	4.25	G	3.50	G	3.50	G	3.70	G

Legend: Good(G), Fair(F)

Table 4 shows the evaluation of the respondents to Optical Character Reader of a Braille Unicode System for the Blind on the criteria of portability. Portability table shows that the device meets the needs for portability as the weight of the device scores a 3.90 WM that has a Verbal Interpretation of Good for students, a WM of 3.70 that indicates Good interpretation for the staffs and a WM of 3.10 with an interpretation of Fair for the IT Practitioners. The overall size of the device produced a WM of 4.60 which is Very Good, 3.30 which is Fair and 3.70 WM which is Good for staffs, and IT practitioners respectively. Although the results are not that high the overall WM reach a Good interpretation with a WM of 3.70 so we can conclude that the device portability was met.

f. Weighted Mean (WM) and Verbal Interpretation (VI) of Students and Staffs of ATRIEV, and IT Practitioner for Optical Character Reader of a Braille Unicode System for the Blind in terms of Cost-Effectiveness

Cost-Effectiveness	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
Components Cost	4.50	VG	4.70	VG	4.60	VG	4.60	VG
Housing Cost	4.50	VG	4.90	VG	4.40	VG	4.60	VG
Overall Mean	4.50	VG	4.80	VG	4.50	VG	4.60	VG

Legend: Very Good(VG)

Table 5 shows the evaluation of the respondents to Optical Character Reader of a Braille Unicode System for the Blind on the criteria of portability. Cost-effectiveness table shows that the components cost got a WM of 4.50 and a verbal interpretation of Very Good for students, a WM of 4.70 which is Very Good for staffs, and a WM of 4.60 which indicates a Very Good interpretation for IT practitioners This implies that both the students, staffs and the IT practitioners agreed that the developed device is a cost-effective one. This is very important now that as technology arises, its price also gets bigger.

g. Overall Weighted Mean (WM) and Verbal Interpretation (VI) evaluation for Optical Character Reader of a Braille Unicode System for the Blind

Variables	Students		Staffs		IT Practitioners		Overall	
	WM	VI	WM	VI	WM	VI	WM	
Accuracy	3.77	G	3.77	G	3.90	G	3.83	G
Efficiency	3.85	G	3.90	G	3.95	G	3.90	G
Portability	4.25	G	3.50	G	3.70	G	3.80	G
Cost-Effectiveness	4.50	VG	4.80	VG	4.50	VG	4.60	VG
Overall Mean	4.10	G	4.00	G	4.01	G	4.03	G

Legend: Good(G), Very Good(VG)

Table 6 shows that the overall based on the four variables got a WM of 4.10 and a verbal interpretation of Good for students, a WM of 4.00 which is Good for staffs, and a WM of 4.03 which indicates a Good interpretation for IT practitioners This implies that all the type of respondents agreed that the developed device is effective in term of the variables mentioned.

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h. ANOVA

To determine the difference among the evaluation of Students, Staffs and IT Practitioners of ATRIEVs' assessment of the Optical Character Reader of a Braille Unicode System for the Blind, the analysis of variance or ANOVA is applied. The results of the application of the test statistics will be presented, and discussed below:

Table 7 Summary of Evaluation of the Respondents

Variables	Source of Variation	Sum of Squares	df	Mean Square	F	P	Decision
Accuracy	Between Groups	0.252	2	0.126	3.316	0.052	Accepted
	Within Groups	1.013	27	0.038			
	Total	1.265	29	0.164			
Efficiency	Between Groups	0.030	2	0.015	7.5	0.026	Rejected
	Within Groups	0.045	27	0.002			
	Total	0.075	29	0.017			
Portability	Between Groups	0.350	2	0.175	6.481	0.005	Rejected
	Within Groups	0.725	27	0.027			
	Total	1.075	29	0.202			
Cost-Effectiveness	Between Groups	0.120	2	0.060	30	0.000	Rejected
	Within Groups	0.040	27	0.002			
	Total	0.160	29	0.061			

Table 7 shows that the difference in the evaluation in term of accuracy, efficiency, portability and cost-effective of the Optical Character Reader of a Braille Unicode System for the Blind

1. Accuracy

Table 7 shows that there is no difference in the evaluation of the Students, Staffs, and IT Practitioners in Optical Character Reader of a Braille Unicode System for the Blind between groups and within groups using one-way ANOVA. The computed value of P = 0.052 which is greater than the 0.05 level of significance accepts the null hypothesis. The result of the non-rejection of the null hypothesis indicates the equality of evaluation among the three groups of respondents which further proves that the Optical Character Reader of a Braille Unicode System for the Blind meets the specification and requirements of the respondents in terms of Accuracy

2. Efficiency

Table 7 shows that there is a difference in the evaluation of the Students, Staffs, and IT Practitioners in Optical Character Reader of a Braille Unicode System for the Blind between groups and within groups using one-way ANOVA. The computed value of P = 0.026 which is less than the 0.05 level of significance accepts the null hypothesis. The result of the rejection of the null hypothesis indicates the differences of evaluation among the three groups in terms of efficiency since the users are not knowledgeable in terms of technical operation of the device except the IT Practitioners.

3. Portability

Table 7 shows that there is a difference in the evaluation of the Students, Staffs, and IT Practitioners in Optical Character Reader of a Braille Unicode System for the Blind between groups and within groups using one-way ANOVA. The computed value of P = 0.005 which is greater than the 0.05 level of significance accepts the null hypothesis.

The result of the non-rejection of the null hypothesis indicates the equality of evaluation among the three groups of respondents which further proves that the Optical Character Reader of a Braille Unicode System for the Blind meets the specification and requirements of the respondents in terms of Portability.

4. Cost-effectiveness

Table 7 shows that there is a difference in the evaluation of the Students, Staffs, and IT Practitioners in Optical Character Reader of a Braille Unicode System for the Blind between groups and within groups using one-way ANOVA. The computed value of P = 0 which is less than the 0.05 level of significance accepts the null hypothesis. The result of the rejection of the null hypothesis indicates the differences of evaluation among the three groups of respondents which tells that there is a difference in terms of knowledge or experience in cost among the groups of respondents.

IV. CONCLUSIONS

On the account of the foregoing significant findings the following conclusions were made:

1. The stages undertaken in the development of the Optical Character Reader of a Braille Unicode System for the Blind sign the SDLC followed the system engineering procedure with the steps of Defining Requirements to itemize the specification and needs of target client, Iteration of Integration and Testing for the development, coding, designing, and prototyping until customer satisfaction then Deployment to the client and Maintenance. Those steps will help to provide the highest satisfaction of the users.
2. The result of the assessment of Students, Staffs, and IT Practitioners to the accuracy, efficiency, portability, and cost of the Optical Character Reader of a Braille Unicode System for the Blind is Good therefore recommended for implementation.
3. There is a significant difference in the assessment of the Students, Staffs, and IT Practitioners on the Braille Unicode System using Optical Character Reader for the Blind in terms of efficiency, portability and cost-effectiveness while there is no significant difference in terms of accuracy.
4. Based on the problem encountered during the development of the device, the researchers need to consider all the components by making sure that the criteria that need to meet will satisfy the requirements of the device.
5. The problem encountered was solved by adding functionality similar to the functions the beneficiary uses which they recommended as a solution to the problem.

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Author keywords

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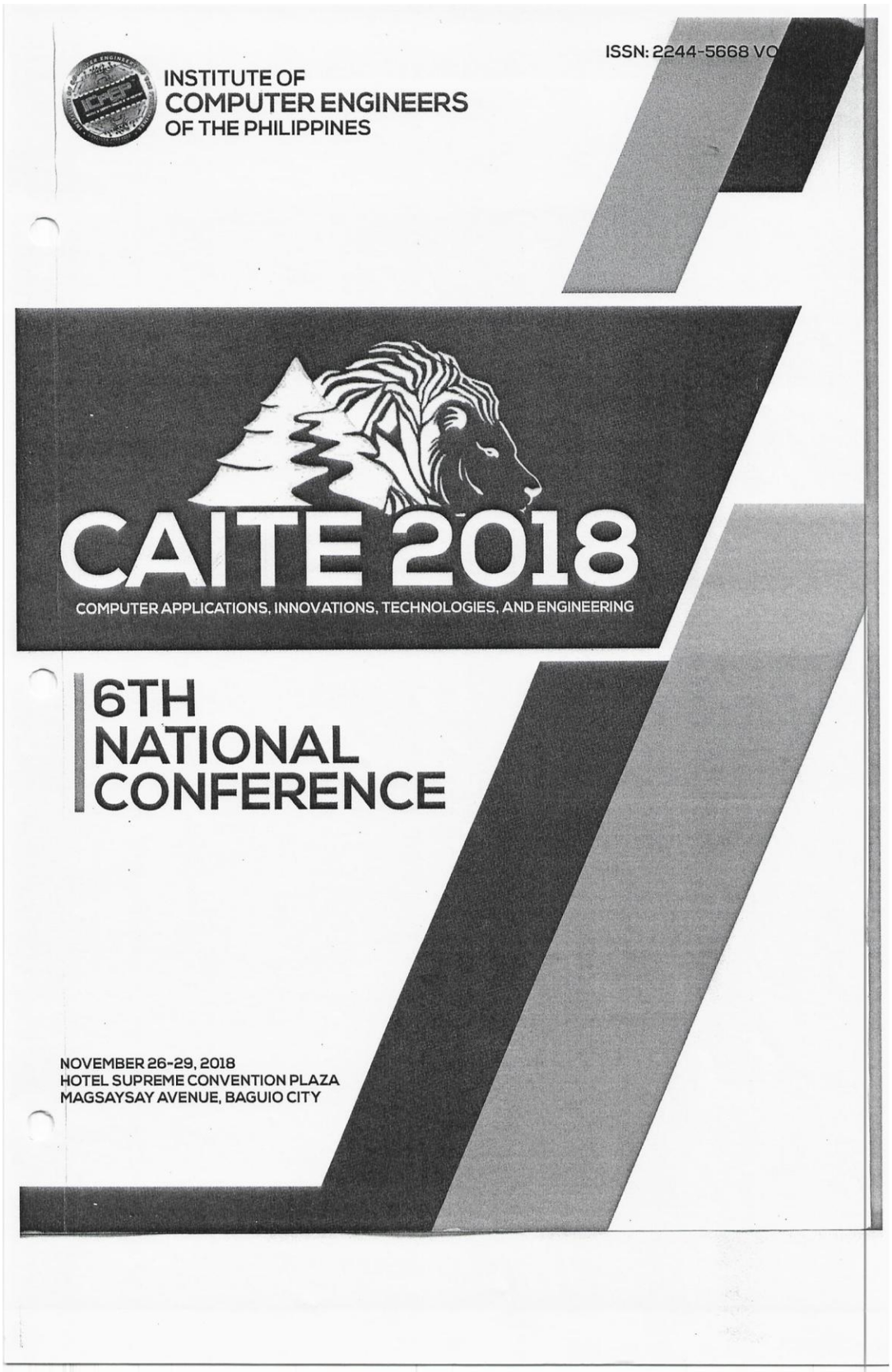

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So, the proponents recommend using a high-resolution camera to acquire better quality of images. Using an updated and higher version of microcontroller other than Raspberry Pi 3 would also be better to enhance the performance of processing.

FIGURES/CAPTIONS

The following formulas were used in the computation of precision, recall and f1-score.

$$F1\ Score = \frac{2 * (Recall * Precision)}{Recall + Precision}$$

$$Precision = \frac{True\ Positive}{True\ Positive + False\ Positve}$$

$$Recall = \frac{True\ Positive}{True\ Positve + False\ Negative}$$

REFERENCES

[1] Glasbey, C., Gray, A., Martin N., & Young, D. (n.d.). Cell identification in Differential Interference Contrast microscope images using template matching.

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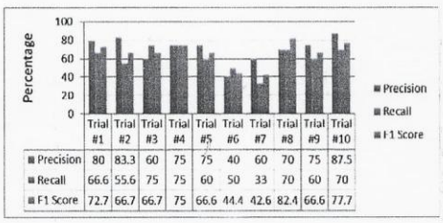
A. F1 Score

The performance of the system was tested using confusion matrix. Values obtained from confusion matrix were used in the computation of F1-score, precision and recall.

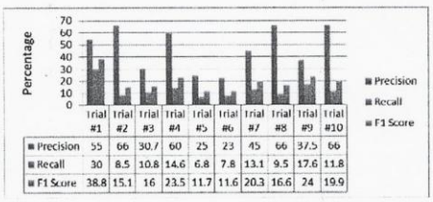
Figure 2 and Figure 3 shows the graphical representation of the system performance of identifying Dunaliella sp. and Chlorella sp., and the computed percentage of precision, recall and f1-score in each trial.

In Figure 2, precision, recall and f1-score does not differ significantly in each trial for Dunaliella sp. Since the system outputs a high precision and recall and the percentages reaches above 50%, the classifier for Dunaliella sp. returns a relevant result.



	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6	Trial #7	Trial #8	Trial #9	Trial #10
Precision	80	83.3	60	75	75	40	60	70	75	87.5
Recall	66.6	55.6	75	75	60	50	33	70	60	70
F1 Score	72.7	66.7	66.7	75	66.6	44.4	42.6	82.4	66.6	77.7

Fig. 2 A sample of the System Performance for Dunaliella sp.



	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6	Trial #7	Trial #8	Trial #9	Trial #10
Precision	55	66	30.7	60	25	23	45	66	37.5	66
Recall	30	8.5	10.8	14.6	6.8	7.8	13.1	9.5	17.6	11.8
F1 Score	38.8	15.1	16	23.5	11.7	11.6	20.3	16.6	24	19.9

Fig. 3 A sample of the System Performance for Chlorella sp.

Figure 3 shows that the percentage of precision and recall for Chlorella sp. differs significantly in each trial. High ratio of precision and low ratio of recall means a low f1-score. Also, compared to Dunaliella sp. most of the trials for Chlorella sp. yields a percentage below 50%, hence, it means that the system has low performance when it comes to recognizing Chlorella sp.

B. T-Test

Results produced by the system were compared to results done in manual counting. The following table below shows the result of t-Test between the means of the manual and automated cell count.

t-Test was used to compare the means of the manual and automated process of the system, and to test the null microalgae cells t-test is 0.05.

As shown in Table 1, the computed p-value=0.61437903 is greater than the alpha level, therefore, null hypotheis cannot be rejected and the difference between the sample means of manual and automated process for Dunaliella sp. do not differ significantly.

TABLE I
T-TEST BETWEEN the MEANS of AUTOMATED and MANUAL CELL COUNT for DUNALIELLA SP.

	Automated	Actual
Mean	86.8	83.4
Variance	145.2	62.8
df	7	
t Stat	0.52714762	
P(T<=t) one-tail	0.30718951	
t Critical one-tail	1.8945786	
P(T<=t) two-tail	0.61437903	
t Critical two-tail	2.36462425	

While in Table 2 shows that the computed p-value=0.003293807 of Chlorella sp. t-test is less than the alpha level, hence null hypothesis rejected. This means that the difference between the samples means of manual and automated process differs significantly.

TABLE III
T-TEST BETWEEN the MEANS of AUTOMATED and MANUAL CELL COUNT for CHLORELLA SP.

	Automated	Actual
Mean	499.4	589.8
Variance	1526.8	617.7
df	7	
t Stat	-4.365061906	
P(T<=t) one-tail	0.001646903	
t Critical one-tail	1.894578604	
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t Critical two-tail	2.364624251	

V. CONCLUSION

Based from the analyzed and computed results shown in the table and graphs, the proponents concluded that the system was indeed effective, that there was no significant difference between the manual and automated counting and can be utilized as an alternative for manual counting.

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Image-Based Microalgae Cell Identifier and Counter

Pedrito M. Tenerife Jr.[1], Arvin R. De La Cruz[2], Wilgefortiz P. Catchillar[3], Dannah Louise L. Gabuni[4], Nathaniel Lewis Galang[5], Adrianne Paule M. Langit[6]

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Abstract— **Microalgae have received considerable interest as a potential feedstock for biofuel production because of the useful quantities, like polysaccharides (sugar) and triacylglycerides (fats), they produce. Obtaining high yield and good quality of the said raw materials is must in optimizing biofuel production. Therefore, daily monitoring of algal growth is done manually by counting microalgae cells under the microscope that is time consuming and tedious. Thus, the proponents developed a system for automating the method of counting microalgae cells, specifically Dunaliella sp. cells and Chlorella sp. cells, using image processing and Haar Cascade as classifier implemented in Raspberry Pi to minimize the work and time of counting. Images of cells were taken under a low power objective of microscope. T-test was used to analyze the significant difference between the means of manual and automated counting and F1 score for the accuracy of the system. Based from the analyzed and computed results, average F1 score for identifying Dunaliella sp. is 66.14% while the average F1 score for Chlorella sp. is 19.74%., thus, there was no significant difference between the means of manual cell counting and automated cell counter, yet the performance of the system was accurate in counting and identifying Dunaliella sp. cells than Chlorella sp. cells.**

Index Terms— **Image Processing, Haar Cascade, cell counting, classifier, Raspberry Pi**

I. Introduction

Microalgae cell counting is necessary in determining the number of cells in a millilitre of a liquid. It is done to estimate the size and population of the cultured algae, and to estimate the growth rate of a cell. [4]

The purpose of cell counting is for the management of cell cultures in biological research. [3] In addition, cell counting is important for the routine monitoring of cell health and proliferation rate. [5]

Hemocytometry is the manual way of counting cells that uses microscope and hemocytometer. This is the commonly used method in cell counting. A hemocytometer is a special type of microscopic slide consisting of two chambers, which is divided into nine (9) large squares with each area of 1mm^2. The central counting area contains 25 large squares and each large squares has 16 smaller squares. The chamber are 0.1 mm in height so that each square corresponds to a given volume, applied to count cells with a size of 2-30 micrometer and concentrations of 104-107 cells per mL.[4] The advantage of using this is that it includes the ability to make immediate judgments and decisions about the sample analysis. Cell viability is often accomplished using the trypan blue dye-exclusion method. This method is since viable cells exclude the dye and remain visually clear, whereas nonviable cells are stained blue. [6] But cell counting using hemocytometer suffers from a variety of shortcomings like, lack of statistical robustness at low sample concentration, poor count due to devise misuse, subjectivity of counts among users. In addition, it is very time consuming and tedious operation.

The current method for identifying, counting and measuring cells are at best semi-automatic but slow. This is due to the complex nature of the microscopic images. Also, algal cells are typically clustered and overlapping and a method is needed for accurately separating, identifying and counting individual cells in a sample, while ignoring noise. Overcoming these problems using image analysis is the first step in developing automatic methods of estimating biomass directly from the microscope image. [1]

Nowadays, several automated cell count systems are available that provides the possibility of analyzing number of samples in a shorter time and reduces the variability associated to human error. [3] Automated cell count instruments consist of a digital camera to obtain images and the analyses are performed through specialized software that requires minimal user involvement. The semi-automated Countess from Invitrogen and the fully automated ViCell XR from Beckman Coulter are two instruments currently

employed in viable cell counts at many laboratories worldwide. Although automated instrument facilitates the process of analyzing samples, they are constrained by the availability of a few compatible staining options and may be imprecise in differentiating some types of cells due to technical limitations in their hardware and software. [7] But these automated cell counting systems are costly and internationally available only.

Thus, the researchers developed a cost-efficient system for automating the counting process of microalgae cells in order to lessen the time and effort of counting a pure cultured cell sample specifically Duanliella sp. and Chlorella sp., that will help a lot for the observation of cell growth and cultivation inside a laboratory.

A. Objectives of the Study

General Objective

The researchers aim to develop an image-based microalgae cell identifier and counter implemented in raspberry pi.

Specific Objectives

It specifically aims to design a module for:

1. Calculating the cell density in a milliliter of sample to be used for monitoring the growth rate of microalgae cells,

2. Counting and recognizing microalgae cells using image processing and Haar cascade algorithm, and

3. Automating the counting process of microalgae cells developed in raspberry pi microcontroller.

II. SCOPE AND LIMITATIONS OF THE STUDY

Dunaliella salina and Chlorella sorokiniana are the two species of microalgae could be used for the system. The system can only process images that were taken by a monocular digital microscope that has 100x magnification that is available at the Polytechnic University of the Philippines – Institute of Science and Technology Research Laboratory. Furthermore, the researcher chose the PUP-ISTR to be the sole beneficiary of the project. The system did not cover the classification and counting of microalgae in uncultured environment. Growth monitored by the system was the quantity of microalgae cells per mL. Monitoring the growth size of microalgae cells was not part of the process. The schedule of conducting the cell count and interpretation of results will be done by domain experts from CLS-ISTR.

III. METHODOLOGY

A. Data Gathering

The researchers gathered data and information by using the following research instruments: using online journals and articles from research databases, document analysis for reviewing existing documentation of comparable processes and interview method. The researchers interviewed Prof. Armin S. Coronado, OIC Director of ISTR, related to the development of the system.

B. System Development

The system was implemented in Raspberry Pi 3 microcontroller, with Python language as the programming tool used in the development of the software. OpenCV was used, which is responsible for processing captured images and Haar Cascade Algorithm used as the classifier. HTML and CSS were used for the front-end development while PHP was used for the backend development.

C. Block Diagram

Figure 1 shows the block diagram composed of two processes, image processing using OpenCv and Haar Cascade Classifier. The input of the system is the image captured by the camera. These digital images undergo pre-processing and the processed images will serve as an input for the training and testing using the Classifier inside the Raspberry Pi. The system then identify the microalgae and computes the estimated cell density based from the total *counted cells in the image. Results are displayed in the Touch Screen LCD interfaced in Raspberry Pi.*

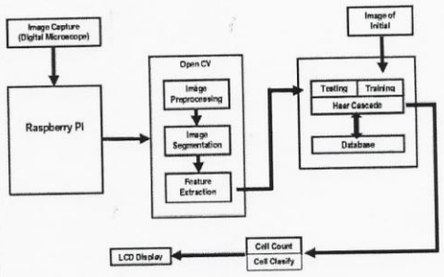

Fig. 1 Block Diagram of the Image-Based Microalgae Cell Identifier and Counter

D. Data Analysis

Microalgae samples were provided by the Polytechnic University of the Philippines Center for Life and Sciences, Institute for Science and Technology Research (CLS-ISTR). Counting the microalgae cells was done both manually and automated. Five (5) trials were done in comparing the manual and automated count, and ten (10) trials for identification process.

F1-Score was used to test the performance of the system in identifying Dunaliella sp. and Chlorella sp. The significant difference between the means of manual and automated counting was analyzed using t-Test.

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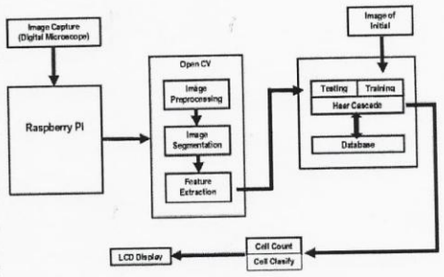

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So, the proponents recommend using a high-resolution camera to acquire better quality of images. Using an updated and higher version of microcontroller other than Raspberry Pi 3 would also be better to enhance the performance of processing.

FIGURES/CAPTIONS

The following formulas were used in the computation of precision, recall and f1-score.

$$F1\ Score = \frac{2 * (Recall * Precision)}{Recall + Precision}$$

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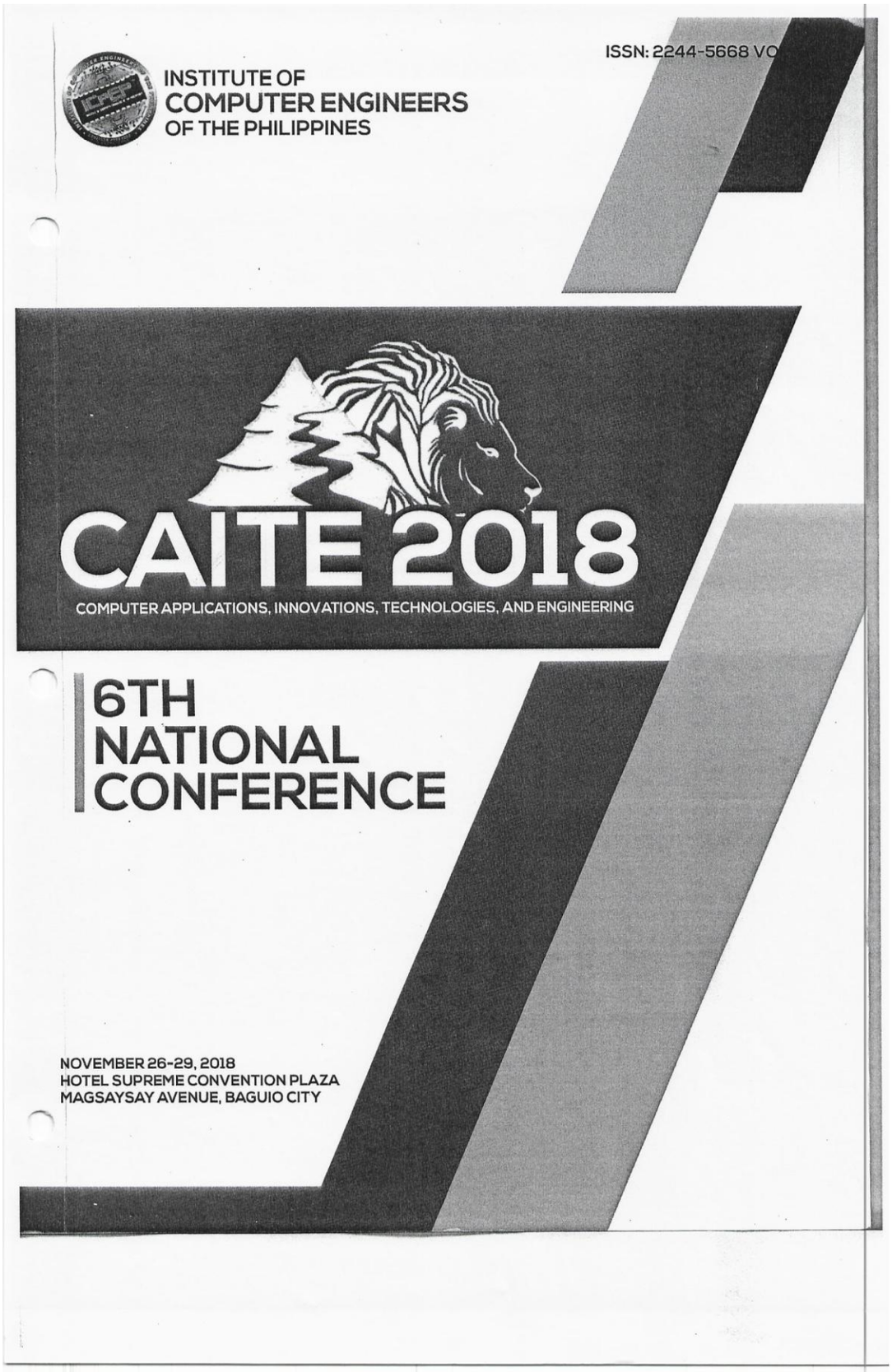

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A. F1 Score

The performance of the system was tested using confusion matrix. Values obtained from confusion matrix were used in the computation of F1-score, precision and recall.

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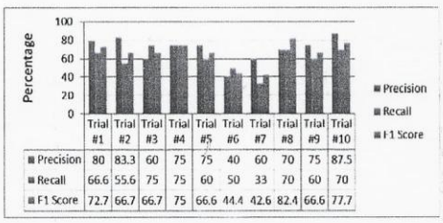

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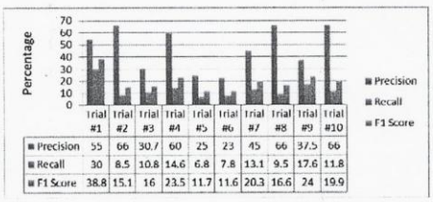

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While in Table 2 shows that the computed p-value=0.003293807 of Chlorella sp. t-test is less than the alpha level, hence null hypothesis rejected. This means that the difference between the samples means of manual and automated process differs significantly.

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Mean	499.4	589.8
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Based from the analyzed and computed results shown in the table and graphs, the proponents concluded that the system was indeed effective, that there was no significant difference between the manual and automated counting and can be utilized as an alternative for manual counting.

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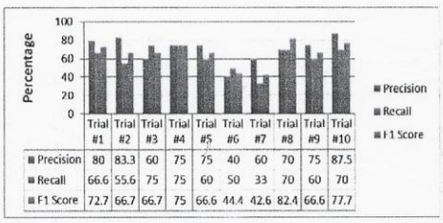

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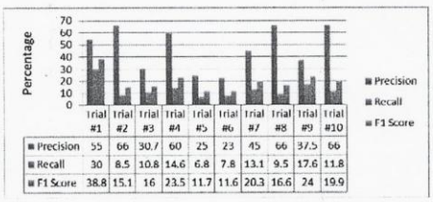
Precision	80	83.3	60	75	75	40	60	70	75	87.5
Recall	66.6	55.6	75	75	60	50	33	70	60	70
F1 Score	72.7	66.7	66.7	75	66.6	44.4	42.6	82.4	66.6	77.7

Fig. 2 A sample of the System Performance for Dunaliella sp.



	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Trial #6	Trial #7	Trial #8	Trial #9	Trial #10
Precision	55	66	30.7	60	25	23	45	66	37.5	66
Recall	30	8.5	10.8	14.6	6.8	7.8	13.1	9.5	17.6	11.8
F1 Score	38.8	15.1	16	23.5	11.7	11.6	20.3	16.6	24	19.9

Fig. 3 A sample of the System Performance for Chlorella sp.

Figure 3 shows that the percentage of precision and recall for Chlorella sp. differs significantly in each trial. High ratio of precision and low ratio of recall means a low f1-score. Also, compared to Dunaliella sp. most of the trials for Chlorella sp. yields a percentage below 50%, hence, it means that the system has low performance when it comes to recognizing Chlorella sp.

B. T-Test

Results produced by the system were compared to results done in manual counting. The following table below shows the result of t-Test between the means of the manual and automated cell count.

t-Test was used to compare the means of the manual and automated process of the system, and to test the null microalgae cells t-test is 0.05.

As shown in Table 1, the computed p-value=0.61437903 is greater than the alpha level, therefore, null hypotheis cannot be rejected and the difference between the sample means of manual and automated process for Dunaliella sp. do not differ significantly.

TABLE I
T-TEST BETWEEN the MEANS of AUTOMATED and MANUAL CELL COUNT for DUNALIELLA SP.

	Automated	Actual
Mean	86.8	83.4
Variance	145.2	62.8
df	7	
t Stat	0.52714762	
P(T<=t) one-tail	0.30718951	
t Critical one-tail	1.8945786	
P(T<=t) two-tail	0.61437903	
t Critical two-tail	2.36462425	

While in Table 2 shows that the computed p-value=0.003293807 of Chlorella sp. t-test is less than the alpha level, hence null hypothesis rejected. This means that the difference between the samples means of manual and automated process differs significantly.

TABLE III
T-TEST BETWEEN the MEANS of AUTOMATED and MANUAL CELL COUNT for CHLORELLA SP.

	Automated	Actual
Mean	499.4	589.8
Variance	1526.8	617.7
df	7	
t Stat	-4.365061906	
P(T<=t) one-tail	0.001646903	
t Critical one-tail	1.894578604	
P(T<=t) two-tail	0.003293807	
t Critical two-tail	2.364624251	

V. CONCLUSION

Based from the analyzed and computed results shown in the table and graphs, the proponents concluded that the system was indeed effective, that there was no significant difference between the manual and automated counting and can be utilized as an alternative for manual counting.

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Also, the system successfully managed to achieve the objectives of the study. The researchers were able to automate the counting process using Raspberry Pi, the system was able to calculate the cell density of the sample and able to count and identify Dunaliella sp. and Chlorella sp. using image processing and Haar Cascade Algorithm. However, the system was not able to return precisely results for Chlorella sp. due to its size and difficulty of processing images because of low resolution camera.

So, the proponents recommend using a high-resolution camera to acquire better quality of images. Using an updated and higher version of microcontroller other than Raspberry Pi 3 would also be better to enhance the performance of processing.

FIGURES/CAPTIONS

The following formulas were used in the computation of precision, recall and f1-score.

$$F1\ Score = \frac{2 * (Recall * Precision)}{Recall + Precision}$$

$$Precision = \frac{True\ Positive}{True\ Positive + False\ Positve}$$

$$Recall = \frac{True\ Positive}{True\ Positve + False\ Negative}$$

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DESIGN AND DEVELOPMENT OF A HYBRID PHOTOBIOREACTOR FOR BIOMASS PRODUCTION OF SPIRULINA PLATENSIS SPECIES

[1]Pedrito M. Tenerife Jr., [2]Arvin R. De La Cruz, [3]Jan Lennard A. Augusto,[4]Tracey C. Cabacaba,[5]Ann Maekylah N. Paiton, [6]Mary Margarette L. Velasquez
[1,2,3,4,5,6]Polytechnic University of the Philippines

Abstract

Microalgae, an organism that can grow in fresh, salt, brackish and waste water, provides promising capabilities to act as catalyst for variety of chemical and valuable agent to produce different commodities. Similar to plants, it consumes Carbon Dioxide (CO2) and yield oxygen during its photosynthetic stage. Nowadays, microalgae have attracted much interest in terms of its potentials for production of biofuel, cosmetic additive, food supplement, fish feed, and in agriculture. In order to further improve the potentials of microalgae for biomass production, a Hybrid Photobioreactor for Spirulina Platensis Sp. is developed for Polytechnic University of the Philippines-Institute of Science and Technology Research (PUP-ISTR). A hybrid photobioreactor was designed and developed by combining the tubular and helical structure design. An airlift mechanism is added that uses an air pump for the inoculum's circulation. In this paper, Spirulina platensis species was used to test the photobioreactor's efficiency.The device can also monitor the current state of the inoculum's power of hydrogen (pH) level and temperature to determine whether the specie's condition is within its optimal state through a microcontroller.A Light Emitting Diode (RGB LED) strips was also installed in the photobioreactor as light source for the microalgae's photosynthetic stage. The researchers used Zarrouk's medium in cultivating the microalgae. Data are saved in a micro secure digital card for retrieval and analysis. A sample of 5 mL is taken every day to be tested on a UV-1800 spectrophotometer to measure the sample inoculum's optical density. The validity of the data that the researchers observed proved to be acceptable through Linear Regression. The structural design supports the other modules such as the light, circulation and sensors which results to a more effective culturing process. The designed circulation using an airlift system was proven to be effective of the culture medium. The clumping of microalgae was prevented and the distribution of nutrients and light was optimized. The biomass production of Spirulina platensis by PUP-ISTR was increased through the photobioreactor.

Keywords - Algae culture, Biomass, Inoculum, Microalgae, Photobioreactor.

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Abstract

Microalgae, an organism that can grow in fresh, salt, brackish and waste water, provides promising capabilities to act as catalyst for variety of chemical and valuable agent to produce different commodities. Similar to plants, it consumes Carbon Dioxide (CO2) and yield oxygen during its photosynthetic stage. Nowadays, microalgae have attracted much interest in terms of its potentials for production of biofuel, cosmetic additive, food supplement, fish feed, and in agriculture. In order to further improve the potentials of microalgae for biomass production, a Hybrid Photobioreactor for Spirulina Platensis Sp. is developed for Polytechnic University of the Philippines-Institute of Science and Technology Research (PUP-ISTR). A hybrid photobioreactor was designed and developed by combining the tubular and helical structure design. An airlift mechanism is added that uses an air pump for the inoculum's circulation. In this paper, Spirulina platensis species was used to test the photobioreactor's efficiency.The device can also monitor the current state of the inoculum's power of hydrogen (pH) level and temperature to determine whether the specie's condition is within its optimal state through a microcontroller.A Light Emitting Diode (RGB LED) strips was also installed in the photobioreactor as light source for the microalgae's photosynthetic stage. The researchers used Zarrouk's medium in cultivating the microalgae. Data are saved in a micro secure digital card for retrieval and analysis. A sample of 5 mL is taken every day to be tested on a UV-1800 spectrophotometer to measure the sample inoculum's optical density. The validity of the data that the researchers observed proved to be acceptable through Linear Regression. The structural design supports the other modules such as the light, circulation and sensors which results to a more effective culturing process. The designed circulation using an airlift system was proven to be effective of the culture medium. The clumping of microalgae was prevented and the distribution of nutrients and light was optimized. The biomass production of Spirulina platensis by PUP-ISTR was increased through the photobioreactor.

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DEVELOPMENT OF E-BAG WIRELESS CHARGER FOR GADGETS

[1]Remedios G. Ado,[2]Rolito L. Mahaguay
[1,2]College of Engineering, Polytechnic University of the Philippines,
Sta. Mesa Manila, 1016, Philippines

Abstract

Engineers and technologist who go in the fieldwork every day are gadget dependent in monitoring the status of their projects, during outside team meetings and presentations. They use different portable devices such as mobile phones, tablets and laptops in the delivery of their tasks which need electric power sources to operate. This research focused on the development of readily wearable e-Bag as a way to power portable devices. The developed wearable e-Bag used the solar panels to generate power for the devices in times when gadgets are power-deficient. The solar panels collect the solar energy and store it in a lithium-ion battery inside the bag. The e-Bag was designed in a simple and creative way. It has wired charging ports to cater phones and devices that are not capable of wireless charging. A battery meter is provided as charging indicator status. The e-Bag has built-in battery that can supply 5V and 19 V. The stored voltage and power were calculated using Ohms Law. It was able to supply 5V and 19V to the devices such as Android, Nokia Lumia800 cellular phones with built-in wireless module, any modeland brand of laptops and tablets. The prototype was tested in an indoor and outdoor environment under the sunny and cloudy weather conditions. Continuous testing was done in two weeks from nine o'clock in the morning up to four o'clock in the afternoon with two hours' interval. The actual temperature ranges from 23° to 32° in the last two weeks of October 2017.

Keywords - solar energy; renewable energy; wearable technology; wireless charger; portable devices

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Abstract

Microalgae, an organism that can grow in fresh, salt, brackish and waste water, provides promising capabilities to act as catalyst for variety of chemical and valuable agent to produce different commodities. Similar to plants, it consumes Carbon Dioxide (CO2) and yield oxygen during its photosynthetic stage. Nowadays, microalgae have attracted much interest in terms of its potentials for production of biofuel, cosmetic additive, food supplement, fish feed, and in agriculture. In order to further improve the potentials of microalgae for biomass production, a Hybrid Photobioreactor for Spirulina Platensis Sp. is developed for Polytechnic University of the Philippines-Institute of Science and Technology Research (PUP-ISTR). A hybrid photobioreactor was designed and developed by combining the tubular and helical structure design. An airlift mechanism is added that uses an air pump for the inoculum's circulation. In this paper, Spirulina platensis species was used to test the photobioreactor's efficiency.The device can also monitor the current state of the inoculum's power of hydrogen (pH) level and temperature to determine whether the specie's condition is within its optimal state through a microcontroller.A Light Emitting Diode (RGB LED) strips was also installed in the photobioreactor as light source for the microalgae's photosynthetic stage. The researchers used Zarrouk's medium in cultivating the microalgae. Data are saved in a micro secure digital card for retrieval and analysis. A sample of 5 mL is taken every day to be tested on a UV-1800 spectrophotometer to measure the sample inoculum's optical density. The validity of the data that the researchers observed proved to be acceptable through Linear Regression. The structural design supports the other modules such as the light, circulation and sensors which results to a more effective culturing process. The designed circulation using an airlift system was proven to be effective of the culture medium. The clumping of microalgae was prevented and the distribution of nutrients and light was optimized. The biomass production of Spirulina platensis by PUP-ISTR was increased through the photobioreactor.

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systems using operational amplifiers. Designing an analog Linear Quadratic Gaussian (LQG) controller is selected as a case study. The controller in the s-domain is firstly designed based on the mathematical model of the plant to be controlled, and then simulated and adjusted. Next, the plant and the controller in the s-domain will be converted to equivalentcorresponding continuous electronic circuits using operational amplifiers and continued for simulating. The main purpose of these proposed additional steps is to confirm that converting the controller from s-domain to corresponding analog electronic circuits using operational amplifiers is correct or not. After that, the controller will be implemented and applied to the real setup. For a good design, the simulation results of the resulting controlled system in s-domain, also inequivalent analog electronic circuits, and experimental resultsin the real setup are almost the same

S1002
Dr. Nguyen Duy Cuong

An Adaptive LQG Combined With the MRAS - Based LFFC for Motion Control Systems
Nguyen Duy-Cuong; Nguyen Van Lanh; Gia Thi Dinh
Thai nguyen University of Technology, Thai nguyen City, Viet nam.

Abstract

The aim of this paper is to develop advanced controllers for electromechanical motion systems. A new controller is proposed to take into account the inherent non-linear disturbances, measurement noise, and variations and uncertainties in process behavior. It consists of a Linear Quadratic Gaussian (LQG) controller and a separate supplementary MRAS-based Learning Feed-Forward Controller (LFFC). Instead of design that is based on a fixed mathematical model of the process, the optimal steady-state filter gain L in the Linear Quadratic Estimator (LQE) and the feedback gain K in the Linear Quadratic Regulator (LQR) can be determined based on the parameters of the feed-forward part, which follows continuously the process at different load conditions. This will result in "an adaptive LQG combined with the MRAS-based LFFC". Simulation results demonstrate the potential benefits of the proposed method.

S017
Mr. Trong-Nguyen Nguyen

Static Hand Gesture Recognition using Principal Component Analysis combined with Artificial Neural Network
Trong-Nguyen Nguyen, Huu-Hung Huynh, Jean Meunier
Danang University of Science and Technology

Abstract

Sign language is the primary language used by the deaf community in order to convey information through gestures instead of words. In addition, this language is also used for human-computer interaction. In this paper, we propose an approach which can recognize sign language, based on principal component analysis and artificial neural network. Our approach begins by detecting the hand, pre-processing, determining eigenspace to extract features and using artificial neural network for training and testing. This method has low computational cost and can be applied in real-time. The proposed approach has been tested with high accuracy and is promising.

S033
Prof. Genci Capi

Assistive humanoid robot arm motion generation in dynamic enviro[illegible]ent based on Neural Networks
Genci Capi, Zuškfli Mohamed, Mitsuki Kitani and Shin-ichiro Kaneko
University of Toyama

Abstract

Assistive humanoid robots operating in everyday life environments have to autonomously navigate and perform several tasks. In this paper we propose a neural network based humanoid robot navigation and arm trajectory generation. The robotic system, which is equipped with a visual sensor, laser range finders, navigates in the environment. The neural controllers generate the robot arm motion in dynamic environments where obstacles of different shapes and positions are present. We have implemented the proposed algorithms in the hardware of a mobile humanoid robot. The robot can navigate in the environment reach the table and pick the target object. The motion generated yield good results in both simulation and experimental environments.

S003
Dr. Anh Duc Dang

Formation Control of Leader-Following UAVs to Track a Moving Target in a Dynamic Environment
Anh Duc Dang and Joachim Horn
Helmut Schmidt University

Abstract

This paper presents a new approach to formation control of a swarm of unmanned aerial vehicles (UAVs) to track a moving target in dynamic environment based on the artificial potential field method combined with a state feedback controller. In this approach, an attractive potential field is generated between the leader and the target by the relative position of them to drive the leader to track the target. The other robots in the swarm are controlled by the attractive potential field between them and the leader to follow the leader. By the influence of the potential field between neighboring robots, the organization of the swarm is stable and robust, and the collisions do not happen in the swarm. Obstacle avoidance is driven by a repulsive potential field thatis created in the region around the obstacles. The effectiveness of the proposed approach has been verified in simulations.

SESSION – 3-4 IS.A1 2014
Venue: Rosemary
Session Chair:
Time: 13:30p.m-15:40p.m

A006
Prof. Jian-Da Wu

Driver Voice Identification System Using Auto-correlation Function and Average Magnitude Difference Function
Jian-Da Wu, Pang-Yi Liu, Guan-Long Hong
Graduate Institute of Vehicle Engineering, National Changhua University of Education

Abstract

This study presents a driver identification system using voice analysis for a vehicle security system. The structure of the proposed system has three parts. The first procedure is speech pre-processing, the second is feature extraction of sound signals, and the third is classification of driver voice. Initially, a database of sound signals for several drivers was established. The volume and zero-crossing rate (ZCR) of sound are used to detect the voice end-point in order to reduce data computation. Then the Auto-correlation Function (ACF) and Average Magnitude Difference Function (AMDF) methods are applied to retrieve the voice pitch features. Finally these features are used to identify the drivers by a General Regression Neural Network (GRNN). The experimental results show that the development of this voice identification system can use fewer feature vectors of pitch to obtain a good recognition rate.

A007
Mr Kaoru Azumaya

Personal Portable Proxy on a USB Flash Drive
Kaoru Azumaya, Shiori Sato, Manabu Okamoto
Kanagawa Institute of Technology, Shimo-ogino 1030 Atsugi-shi Kanagawa, Japan

Abstract

In this paper, we propose a personal portable proxy server that offers various functions from a USB flash drive. With the rapidly growing volume of data generated by applications, managing that data becomes a problem. A USB flash drive can help us manage data easily because we can carry any data and any application anytime in a USB flash drive. Therefore, we propose an intelligent personal proxy server with personal functions on a USB flash drive. This intelligent proxy provides convenient features, such as content filtering, history sharing, phishing prevention, and especially automatic form completion. We also propose using the proxy to exchange personal information safely and efficiently.

A003
Mr Esmat Abdulmajid

Using TAM to Study the User Acceptance of IT in the Yemeni Public Sector
Esmat Abdulmajid Wahdain, Mohammad Nazir Ahmad, and Nor Hidayati Zakaria
Universiti Teknologi Malaysia

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Wahdain

Abstract

Although IT offers promising improvements in public sector efficiency, there is a consensus that these cannot be realised until IT tools become widely spread and used. This research in progress aims to improve the utilisation of IT in the context of the Yemeni public sector by identifying the factors that influence IT user's acceptance. The Research proposes a model based on the Technology Acceptance Model with some added factors that are believed to have a significant influence in the context being studied, such as: perceived personal benefit, organisational culture and gender.

A012
Mr Ha Duc Son Van

Supporting Authorization Reasoning Based on Role and Resource Hierarchies in an Ontology-enriched XACML Model
Ha Duc Son Van, Tuan Anh Dang, Tran Khanh Dang
Ho Chi Minh City University of Technology

Abstract

RBAC is an excellent model in security domain. In which, users are not assigned to permissions directly but through their roles. Therefore, permissions of individual users are managed by assigning these users to appropriate roles which are quite stable. Besides, RBAC also supports role hierarchy to reduce the number of authorization policies. However, in organizations those have a large number of roles or roles changed frequently, using one role hierarchy makes the maintenance process become more complicated. Moreover, because RBAC does not support resource hierarchy, the number of policies may be very large for organizations which have many different types of resources. To overcome these drawbacks, we propose a new model to express role and resource hierarchies. These hierarchies are implemented by OWL. We show how to support the NIST standard for RBAC in our model. We also extend XACML model to support reasoning ability by defining new functions that use reasoning services based on the OWL ontology

---

A011
Ms. Thi Ly Vu

Robust Method to Compute Mutual-Spatial Feature for Image Parsing Problem
Thi Ly Vu and Chong Ho Lee
School of Information and Communication Engineering, Inha University

Abstract

The paper presents new method to improve computational performance by introducing the mutual spatial feature in order to make strong visual cue in image parsing problem based on non-parametric model. This feature models the spatial context and mutual information in our previous study [17] to enhance accuracy and performance of image parsing problem in calculating the probability of co-occurrence objects. The experimental results based on Matlab programming language using SIFTFlow and Barcelona datasets showed that the mutual-spatial feature is promising to refine image parsing problem

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A1004
Ms Haeni Lee

An Integrated Framework for Organizational Security Management
Haeni Lee, Chanhee Han, Taejong Yoo
Sangmyung University, Seoul, Republic of Korea

Abstract

Recently most of the domestic enterprises have worked in all over the world. They have continued technical development efforts to be more competitive. It is very important that organizations not only develop technologies but also protect technologies. As industrial security is emphasized in country, organizations believe the necessity of security. There are security activities of each organization from major companies to small companies. But, there is a lack of studies about systematic security activities. Major companies have examined the security system. But it is difficult for security activities to launch in small businesses case, because of a lack of knowledge about the security and enough capital. Thus, this paper proposed an integrated framework that has four areas with managerial, physical, technical and human field. We explained interrelations and roles of each section and analyzed case studies of industrial security. We expect to use reference of organizations that have difficult to start security activities, when they establish security policies

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A1003
Ms. Shin-Jeong Song

Analysis of the Curriculum of Department of Information Security in iversity and Comparison with the Industrial Needs in Korea
Min-Jeong Kim, Shin-Jeong Song, Haeni Lee, Jinho Yoo
Sangmyung University

Abstract

These days cyber attacks are increasing all over the world, and the national critical infrastructure and information network protection have become important. For this reason, the concentrated investment in information security and bringing-up professional human resource are essential, but there is a shortage of information security workforce in Korea. Currently, departments of information security in the university make efforts to bring up human resource of information security. On the other hand they worry about designing the curriculum of information security. So this paper investigates the curriculum of information security in the University of Korea, and then compare with industrial needs of information security. Through this analysis, we will be discussed a way to bring up customized expert of information security.

A1005
Mr. Chanhee Han

The Analysis of Relationship between online contact of obscene contents and real experience
Chanhee Han, Taehwan Kim, Youngsu Son, Jinho Yoo
Sangmyung University

Abstract

In this study, we analyzed relationship between online contact of obscene contents and real experience. For this study, Survey was conducted 500 people in Korean. Analysis shows that online contact of obscene contents has significant influence on the real experience.

A3006
Assoc. Prof. Hamad Ibrahim Alomran

Text Mining-based Semantic Web Architecture (TM-SWA) for E-Learning Systems
Hamad Ibrahim Alomran
Al-Imam Muhammad ibn Saud Islamic University

Abstract

This paper highlights semantic web techniques and proposes architecture for e-Learning-based systems for the academic portal. Text mining is used with the proposed model for better processing of unstructured data available in XML and RDF formats. An algorithm will be used to support building a web retrieval system to extract the hidden knowledge for the semantic web by ontologies for e-learning items to classify and find the relationships between the leaning items via the academic portal.

A028
Prof. Hyung-Woo Lee

Detection of Malicious Android Mobile Applications Based on Aggregated System Call Events
You Joung Ham,Hyung-Woo Lee
Hanshin Univ.

Abstract

The diverse types of mobile applications are used regardless of time and place, as a number of Android mobile device users have been recently increased. However, the breach of privacy through illegal leakage of personal information and financial information inside mobile devices has occurred without users' notices, as the malicious mobile application is relatively increasing In order to reduce the damage caused by the malicious Android applications, the efficient detection mechanism should be developed to determine normal and malicious apps correctly. In this paper, we aggregated real-time system call events activated from malware samples distributed by Android Malware Genome Project. After extracting the basic difference feature and characteristics of system call events pattern from each normal and malicious applications, we can determine whether any given anonymous mobile application is malicious or normal one.

A3001
Assoc. Prof. Remedios G. Ado

Mobile Emergency Response Application using Geolocation for Command Centers
Engr. Remedios G. Ado, Jethro B. De Guzman, Ritz Carlo C. De Guzman
Polytechnic University of the Philippines

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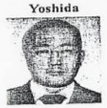
Mr. Jethro B. De Guzman **Mr. Ritz Carlo C. de Guzman**	**Abstract** This paper introduces Mobile Emergency Response Application using Geolocation for Command Centers. It is a combination of a mobile and web application for responding to emergency requests for ambulance, fire truck and police by people in a certain area or city. The mobile application would detect user's current location through geolocation and sends to the web application deployed in a command center the name, age, mobile number and location of the user for easily dispatching of emergency units.
A3003 **Mr. Woung Jang**	Session-Based Detection of Signaling DoS on LTE Mobile Networks Woung Jang, Se-Kwon Kim, Joo-Hyung Oh, Chae-Tae Im Korea Internet & Security Agency Abstract In recent years, global cellular network service is being changed rapidly to LTE. However, the fast introduction of LTE has been going with not enough research about security threat so it could have many kinds of vulnerability. Therefore, the research about security threat on 4G network is ongoing in many countries. Particularly, in the situation where domestic subscribers are increasing rapidly, the security threats which are hindering stability and usability could make a fatal effect on many users. 4G network should consider the feature of mobile network to keep 4G network stable. Because mobile network has limited radio resources, it releases the radio resource which is not used in selected time and reallocates when requesting the data transmission. Many signaling messages are transferred in the network entities to allocate or release the radio resource. In this paper, it will introduce the technology to detect signaling DoS traffic hindering the stability and usability of network entities managing the radio resources by huge signaling message from the repetitive wireless connection/release message.

SESSION – 4-ICCRD 2014
Venue: Rosemary
Session Chair: Prof.Naoyuki Ishimura
Hitotsubashi University,Japan
Time: 16:00-18:30

F009 **Assoc. Prof.Hiroki Yoshida** 	Effects of Online Cooperative Learning on Motivation in Learning Korean as a Foreign Language Assoc. Prof.Hiroki Yoshida, Seiji Tani, Tomoko Uchida, Jitsuko Masui, and Akira Nakayama Tokoha University,Japan **Abstract** Previous studies highlight positive effects of cooperative learning on language learning motivation. Many attempts have been made to implement cooperative leaning in language classes. Now with the use of computer-mediated communications tools, language learners can learn cooperatively online, out of class. Online cooperative learning provides language learners to communicate with native speakers of their target language, and leads to enhance their motivation in language learning. This study purposed to examine the effects of online cooperative learning on language learners' motivation in KFL. Results indicate that online cooperative learning promotes learners'intrinsic motivation in KFL.
F011 **Prof.NaoyukiIshimura**	Copulas and the information management Prof.NaoyukiIshimura, Ting Li, MasaAki Nakamura Hitotsubashi University,Japan **Abstract** Copula is introduced as a tool for understanding thedependence structure among random variables. Copulas makea link between multivariate joint distributions and univariatemarginal distributions, and provide a flexible way to describenonlinear dependence; copulas therefore

	have been applied in many fields. Here we deal with a family ofgen dArchimedean (GA) copulas. In terms of these GA copulas, wederive the formula for the Kendall's tau, which is a well knownmeasure of concordance. Applications to the management arediscussed.
F006 **Mr.Hoang-Nam Ho** 	A Process for Trace-Based Criteria Weighting in Multiple Criteria Decision Making Mr.Hoang-Nam Ho, MouradRabah, Pascal Estraillier, Samuel Nowakowski L3i Laboratory, University of La Rochelle,France **Abstract** Decision-making has evolved as an interesting research problem for decision community. We consider a decision problem that takes into account several criteria called Multiple Criteria Decision Making (MCDM) in an interactive application for adaptive execution. In this paper, we present a method for automatically weighting criteria generation based on users' traces. In our method, we suggest a process that contains all steps describing alternately what is necessary to prepare in order to weight all criteria. We propose a modified method using Naïve Bayes network to exploit the traces (the past of users), there will be used as information for estimating the score of criteria. Experimental results are presented to illustrate a full process and an automatic generation of weighting criteria by a set of values.
F2002 **Mr. Aaron Erice N. Fernando** 	CERES: Conjuring Emergency Relieving Expert System using M-Health Technology and Rete Algorithm Christopher R. Arellano, Mr. Aaron Erice N. Fernando, Willmel T. Moreno and Matthew Johnry L. Paulino, BenildaEleonor V. Comendador University of thePhilippines, Sta. Mesa, Manila, Philippines **Abstract** The study is a mobile health (M-Health) expert system embedded on Android OS phones as an assistance tool that can support people experiencing physical injuries. It utilizes the Rete Algorithm which is present on most expert systems. The system covers physical injuries which commonly experienced by athletes and students enrolled in human kinetics. Physical injuries are categorized into head, upper body and lower body parts. From these parts, they are defined by type such as: skin injury, bone injury, muscle injury and body pains. The researchers used descriptive method in the study. After the system was developed, it was evaluated by the two groups of respondents: (a) experts and (b) students based on the four (4) parameters such as user-friendliness, functionality, usability and appropriateness of advice. According to the data gathered, analyzed and computed, the proponents found out that there is no significant difference between the evaluation made by the students and by the experts on the developed mobile based application. Both groups of respondents recommend the implementation of CERES.
F015 **Prof. Alberto C. Guillo** 	A Community Cloud-based Course Management System Using Platform as a Service (PaaS) Model for Higher Educational Institutions for Higher Educational Institutions BenildaEleonor V. Comendador and Prof. Alberto C. Guillo Polytechnic University of the Philippines,Philippines **Abstract** The paper promotes a cloud-based course management system for higher educational institutions.Thru cloud services the student's assignments, examinations and other activities are automatically recorded in a database and immediately the results are evaluated. The system provides timely feedback to the learners regarding their rating. It provides online examination that can randomize questions from the question bank which provides unique set of questions per student. Thus, synchronous automated examination is secured even though there is limited

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