



VIMAL JYOTHI ENGINEERING COLLEGE

JYOTHI NAGAR, CHEMPERI – 670632, KANNUR, KERALA

Affiliated to APJ Abdul Kalam Technological University, Approved by AICTE
ISO 9001 : 2015 Certified | Accredited by Institution of Engineers (India), NBA, NAAC
Ph: 0490 2212240, 2213399 Email: office@vjec.ac.in Website: www.vjec.ac.in

NAAC Cycle 2

Criterion: 3.1.1

2019-2020

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SI Number	Project Name with funding agency
1	Design and Implementation of Metaheuristic Algorithm based MPPT Controller of Partially Shaded Photo Voltaic System ANERT , Trivandrum , Kerala
2	Automatic Puttu making machine- KTU-CERD
3	Development of smart SCADA-APJAKTU - CERD - Research Seed Money Scheme
4	Design and development of Smart Ambulatory Monitoring for Alakkode Old Age Homes-UBA



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2019-2020

Design and Implementation of Metaheuristic Algorithm-based MPPT Controller of Partially Shaded Photo Voltaic System

This work proposed a design and implementation of a metaheuristic control method for the maximum power point tracking (MPPT) methodology for photovoltaic systems under partial shading conditions. In order to achieve maximum efficiency of photovoltaic (PV) arrays should operate at their maximum power point (MPP). Therefore, to maximize the power from the PV system, an MPP tracker is usually introduced between the PV arrays and the load, and the system operating point is adjusted to be positioned at the MPP. When the irradiance distribution on the PV arrays is uniform, many traditional MPPT techniques can track the MPP effectively. However, when the PV arrays are partially shaded, multiple MPPs show up, which usually results in the failure to find the global MPP. In order to overcome this difficulty, this proposed work presents a PSO metaheuristic algorithm-based MPPT scheme for PV systems. This PSO heuristic algorithm-based technique not only ensures the ability to find the global MPP but also provides a simpler control scheme and lower system cost. The feasibility of this proposed method is verified by simulation, and it should be validated through hardware implementation. The proposed method is verified under different partial shading conditions and non-uniform irradiance levels using Matlab. The efficiency of the proposed method under partial shading conditions is considerably improved and meets the requirements of the MPPT controller for the PV systems.



File No. ANERT-TECH/346/2018-S(NEP)1/7332/2020

Statement of Expenditure
(Period: From 18.03.2020 to 30.10.2021)

Date:17.11.2021

Project Reference No. : SRI-06/2018-19
Title of the project : Design and Implementation of Metaheuristic Algorithm based MPPT Controller for Partially Shaded Photovoltaic System.
Name & Address of the PI : Dr.R. Senthilkumar,
Professor, EEE Department,
VJEC Kannur.

Details of expenditure:

Sl. No.	Sub head	Sanctioned Amount	Details of Expenditure			Expenditure per sub head
			Date	Particulars	Expenditure (in Rs/-)	
1	Man power	30000.00	1.2.2021-30.7.2021	Technical Assistant	30000.00	30000.00
2	Consumables	10000.00	02.09.2021	Bill attached	6350.00	6350.00
3	Equipment	217500.00	31.08.2021	Bill attached	226000.00	226000.00
4	Travel	7500			7500.00	7500.00
5	Contingencies	7813.00	02.09.2021	APAR CABLE 6 SQMM ROLL	3000.00	3000.00
6	Overhead	8203.00			8203.00	8203.00
	TOTAL	281016.00				281053.00

R. Senthilkumar
Signature of PI

(R. Senthilkumar)
Name

Signature of Head of Institution

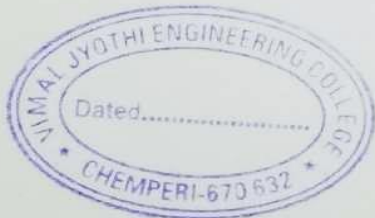
PRINCIPAL
VIMAL JYOTHI ENGINEERING COLLEGE
CHEMPERI - 670632
Name

Signature of Chartered Accountant

Name

For P D THOMAS & CO
CHARTERED ACCOUNTANTS

Seal



THOMAS PULTHAKIDIYIL DEVASIA
FCA, M.No. 095901
UDIN - 21095901AAAADY73

ACCOUNTS OFFICER
Vimal Jyothi Engineering College
Chemperi



2019-2020

Automatic puttu-making machine

As we all know, puttu is a traditional food in Kerala. Yet it is not being served in parties or other functions. Difficulty in making large amounts is the main reason behind this. So, we aim to bring this dish to Kerala as one of the party dishes. The main reason to consider stem cake Puttu as a very healthy breakfast is primarily because it is a steamed preparation, and no oil is used. So far there is no such a device like this to produce puttu in a bulk amount, so our machine allows us to bake puttu in bulk so that not only a few but many can have this dish. Puttu is generally cooked in a metal puttu kutti vessel with two sections. The lower section holds water, and the upper section holds the puttu — where the rice mixture is inserted with layers of grated coconut. Perforated lids separate the sections to allow the steam to pass between them. A number of alternative cooking vessels are used, such as traditional vessels where a perforated coconut shell is attached to a section of bamboo, or a chiratta puttu made of a coconut shell or of metal shaped similarly to a coconut shell. The machines we see around us can make puttu only in less quantity. The most used one for making large quantities of steam cake can make only 25 steam cakes and requires intense labor work. Cleaning the machine is also very difficult.

The preparation of puttu is a tedious process, as making it in bulk quantity is very difficult and takes time. Our automatic puttu-making machine can make 50 steam cakes in less than 10 minutes. To overcome this difficulty in making puttu we have this device that can make puttu in bulk. Our machine has two containers for holding rice powder and grated coconut, which is automated so that only the required amount will fall into the vessel. Externally generated Steam is provided from the bottom of the vessel, and a motor is also provided to rotate the vessel. A temperature sensor tells us whether the puttu is ready by sensing the temperature. A rotating arm is used to take the vessel and puttu out.

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2019-2020

Development of smart SCADA

Natural disasters such as floods and landslides pose significant threats to lives and properties, particularly in regions like Kerala, where such occurrences are frequent due to its geographical vulnerability. To mitigate the impacts of these disasters, an efficient monitoring and alerting system is imperative. This project proposes the implementation of a Disaster Monitoring and Alerting System using Supervisory Control and Data Acquisition (SCADA) technology tailored specifically for the flood and landslide-prone areas of Kerala State. The proposed system integrates various sensors, including water level sensors, rainfall gauges, soil moisture sensors, and landslide detection sensors, strategically placed across vulnerable zones. These sensors continuously collect real-time data on environmental parameters relevant to flood and landslide prediction. The SCADA system gathers, processes, and analyzes this data, providing insights into the current environmental conditions and potential risks. In the event of abnormal readings or critical thresholds being exceeded, the SCADA system triggers automated alerts to designated authorities and residents in the affected areas through multiple communication channels such as SMS, email, and mobile applications. Additionally, the system incorporates a centralized dashboard for real-time visualization of data and situational awareness.

Furthermore, the project includes the development of predictive models using machine learning algorithms to enhance the system's capability to forecast potential disasters based on historical data patterns and meteorological forecasts. These predictive models enable proactive measures to be taken, such as preemptive evacuation and deployment of resources, thereby minimizing the impact on life and property. The proposed Disaster Monitoring and Alerting System aims to improve disaster preparedness, response, and recovery efforts in Kerala State by providing timely and accurate information to decision-makers and the public. By leveraging SCADA technology and advanced data analytics, this project strives to create a resilient and adaptive framework for disaster management in flood and landslide-prone areas, ultimately saving lives and reducing economic losses.



**APJ Abdul Kalam Technological University
Thiruvananthapuram**

Abstract

APJAKTU -Research Section- CERD - Financial Assistance to Student Project –"Disaster Monitoring and Alerting System in the Flood and Landslide Prone areas of Kerala state using SCADA" -Dr. G. Glan Devadhas, Professor, EIE Department, Vimal Jyothi Engineering College, Kannur- Reimbursement of Expenditure incurred - Sanctioned – Orders issued.

RESEARCH SECTION

U.O.No. 333/2022/KTU

Thiruvananthapuram, Dated: 20.02.2022

*Read:-*1. UO. No. 218/2020/KTU dated 06.02.2020.

2. Bills and Vouchers and Audited Utilization certificate submitted by Dr. G. Glan Devadhas, Professor, EIE Department, Vimal Jyothi Engineering College, Kannur.

ORDER

Vide paper read as 1 above, financial assistance to the student project titled "Disaster Monitoring and Alerting System in the Flood and Landslide Prone areas of Kerala state using SCADA" had been sanctioned for an amount of ₹14,000/- (Rupees Fourteen Thousand only) to Dr. G. Glan Devadhas, Professor, EIE Department, Vimal Jyothi Engineering College, Kannur as detailed below.

Sl. No	Particulars	Amount
1	Consumables	1000
2	Equipment	10000
3	Travel	1000
4	Contingency	2000
	Total	14000

Vide paper read 2 above Dr. G. Glan Devadhas, Professor, EIE Department, Vimal Jyothi Engineering College, Kannur, has forwarded the audited Statement of Expenditure and Utilization Certificate of the above student project for an amount of ₹ 20,453/- and requested for reimbursement of the expenses incurred.

On verification of the bills & vouchers, an amount of ₹8,583/- (Rupees Eight Thousand Five hundred and Eighty Three only) is eligible for payment towards reimbursement of the expenses incurred in connection with the above Student Project.

Sanction is therefore accorded for the payment of an amount of ₹8,583/- (Rupees Eight Thousand Five hundred and Eighty Three only) to Dr. G. Glan Devadhas, Professor, EIE Department, through the Principal Vimal Jyothi Engineering College, Kannur, towards reimbursement of the financial assistance sanctioned to the student project titled "Disaster Monitoring and Alerting System in the Flood and Landslide Prone areas of Kerala state using



SCADA."

The expenditure is debited to the Head of Account "**S-3022 Innovative Students Project**".

Orders are issued accordingly.

Sd/-

Dr. Shalij P.R *
DEAN (Research)

Copy to:-

1. Accounts Section.
2. The Principal, Vimal Jyothi Engineering College.
3. Dr. G. Glan Devadhas, Professor, EIE Department, Vimal Jyothi Engineering College, Kannur.

* This is a computer system (Digital File) generated letter. Hence there is no need for a physical signature.



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2019-2020

Design and development of Smart Ambulatory Monitoring for Alakkode Old Age Homes.

Alakode is a rural village in Irikkur Block, Kannur district of Kerala with two old age homes Karunya Bhavanand Priest home . Karunya Bhavan consists of 52 members and the Priest home consists of 32 members. Old-age people are facing health issues which can lead to fainting and uneasiness.

Falls are also the most common cause of older adult traumatic brain injuries. The majority of these members are in bad health condition. Among older adults, falls may cause fractures, hospital admission for trauma, and injury deaths.



Tomson Electronics

H.O. Tara Mansion, 39/4287 - A&B, Manikkil Cross Road
 Pallimukku, Ernakulam
 Kerala, P.O 682016
 Tel: +91 - 484 2359001 Email: info@tomson.in
 www.tomson.in

Alakode project

SALES INVOICE

GSTIN : 32AAZPJ7988H1ZT

PAN : AAZPJ7988H

STATE : KERALA[32]

M/s. VIMAL JYOTHI ENGINEERING COLLEGE
 JYOTHI NAGAR, CHEMPERI - 670632, KANNUR
 DIST.
 Kerala
 India
 PH.- 0460-2213399
 State : Kerala Code : 32

CASH/CREDIT CARD

Invoice No. : B 2302
 Date : 24-Jun-2020
 LPO No. :
 Reverse Charge : N
 GR/RR No. :
 Transport :
 Vehicle No. :
 Station : Kerala
 E-Way Bill No. :

S.No.	Description	HSN/SAC	UoM	Qty	Unit Price	KFC	CGST %	CGST Amt.	SGST %	SGST Amt.	Amount (INR)
1	NODEMCU ESP8266 WIFI ESP-12E LUA CH340	85177010	nos	35	233.025	81.550	9 %	734.030	9 %	734.030	9,623.94
2	6 AXIS GYRO MODULE MPU 6050	85381010	nos	35	72.386	25.340	0 %	228.020	9 %	228.020	2,989.55
3	SMM PLASTIC LDR (GL S528)	8533	nos	50	2.479	1.250	9 %	11.160	9 %	11.160	146.27
4	IR PROXIMITY SENSOR BOARD	85381010	nos	20	38.672	7.740	9 %	69.610	9 %	69.610	912.66
5	ULTRASONIC MODULE SR 04	85361010	nos	30	60.487	18.150	9 %	103.310	9 %	163.310	2,141.23
6	FLAT CABLE L-200MM M/M	8544	nos	300	1.487	4.500	9 %	40.150	9 %	40.150	526.40
7	FLAT CABLE L-200MM F/F	8544	nos	300	1.487	4.500	9 %	40.150	9 %	40.150	526.40
8	UBLOX NEO 6M -O- 001	85177010	nos	3	314.337	9.430	9 %	84.870	9 %	84.870	1,112.75
9	HEART BEAT SENSOR	90312000	nos	10	44.622	4.460	9 %	40.160	9 %	40.160	526.54
10	NTC 10K 5MM	8533	nos	50	2.975	1.500	9 %	13.390	9 %	13.390	175.53
11	BUZZER CC1212A CEDICOM	85416000	nos	20	12.395	2.480	9 %	22.310	9 %	22.310	292.52
12	PRESSURE SENSOR BMP 180	85381010	nos	35	68.420	23.940	9 %	215.520	9 %	215.520	2,825.74
13	CONDENSOR MIC	8541	nos	35	4.462	1.580	9 %	14.060	9 %	14.060	184.29
14	ARDUINO UNO R3 SMD	84733020	nos	20	297.479	59.500	9 %	535.460	9 %	535.460	7,020.50
15	ARDUINO NANO CH 340	8534	nos	35	255.832	89.530	9 %	805.870	9 %	805.870	10,565.86
16	ARDUINO PRO MINI 3.3V/BM	84733020	nos	35	185.429	64.890	9 %	584.100	9 %	584.100	7,658.22
17	MICRO WAVE RADAR SENSOR RCWL-05163	85381010	nos	10	59.496	5.950	9 %	53.550	9 %	53.550	702.06
18	SOUND SENSOR MODULE	90312000	nos	15	66.437	9.960	9 %	89.690	9 %	89.690	1,175.94
19	LORA MODULE SX 1278	85177010	nos	2	396.639	7.930	9 %	71.400	9 %	71.400	936.08
20	IC AT MEGA 32A U	8542	nos	5	117.008	5.850	9 %	52.650	9 %	52.650	690.34
21	RASPBERRY PI-4 MODEL B (4GB)	84715000	nos	1	4,333.277	43.330	9 %	390.000	9 %	390.000	5,113.26
22	MICRO SD CARD 16GB (R)	8523	nos	1	275.663	2.760	9 %	24.810	9 %	24.810	325.26
23	USB CHARGER 3 USB BLUEI	8504	nos	1	366.462	3.660	9 %	32.980	9 %	32.980	432.42
24	HDMI CABLE 1.5 M (MICRO HDMI)	8544	nos	1	153.698	1.540	9 %	13.830	9 %	13.830	181.36
25	TP 4056 MODULE WITHOUT PROTECTION	85049090	nos	1	21.815	0.220	9 %	1.960	9 %	1.960	25.74

Sl No	Description	HSN/SAC	UoM	Qty	Unit Price	RFC	CGST %	IGST %	Net Amt.	CGST Amt.	IGST Amt.	Amount (INR)
1	BATTERY INCLUDE 18650	8530	nos	1	23,700	0.210	0%	0%	23,100	0.000	0.000	23,100
2	LAT 2500 STEP DOWN POWER SUPPLY	85301010	nos	1	88,034	0.550	0%	0%	86,000	0.000	0.000	86,000
3	FORCE SENSOR 38.1MM SQUARE	8533	nos	10	400,630	30.000	0%	0%	360,000	0.000	0.000	360,000
4	BATTERY 3.7V/300MAH	8507	nos	35	110,017	40.000	0%	0%	360,000	0.000	0.000	360,000
5	BATTERY 18650 3.7V 3000MAH (USELITECH)	8507	nos	25	50,939	14.000	14%	14%	200,310	14,000	200,310	1,206,710
6	ATTINY RS ARDUINO USB MICRO	84733020	nos	25	135,830	33.000	0%	0%	300,000	0.000	0.000	300,000
7	P & F Charges @ 18%	99	job	1	1,239,400	12.000	0%	0%	1,11,000	0.000	1,11,000	1,11,000

HSN/SAC	Tax Rate	Qty.	UQC	Taxable Amt.	CGST Amt.	IGST Amt.	CGST %	IGST %	Total Tax
84715000	10%	1.000	nos	4333.20	390.00	390.00	0.00	0.00	780.00
84733020	10%	35.000	nos	15039.83	1429.23	1429.23	0.00	0.00	2858.46
8504	10%	1.000	nos	366.46	33.98	33.98	0.00	0.00	67.96
85049030	10%	1.000	nos	21.02	1.96	1.96	0.00	0.00	3.92
8507	10%	35.000	nos	4060.60	365.45	365.45	0.00	0.00	730.90
8507	20%	25.000	nos	1480.30	200.37	200.37	0.00	0.00	400.74
85177010	10%	3.000	nos	9092.17	890.30	890.30	0.00	0.00	1,780.60
8523	10%	1.000	nos	275.66	24.81	24.81	0.00	0.00	49.62
8533	10%	50.000	nos	4239.09	381.51	381.51	0.00	0.00	763.02
8534	10%	35.000	nos	8954.12	805.87	805.87	0.00	0.00	1,611.74
8536	10%	1.000	nos	23.00	2.14	2.14	0.00	0.00	4.28
85381010	10%	35.000	nos	8166.25	734.96	734.96	0.00	0.00	1,469.92
8541	10%	35.000	nos	156.17	14.06	14.06	0.00	0.00	28.12
85416000	10%	20.000	nos	247.90	22.31	22.31	0.00	0.00	44.62
8542	10%	5.000	nos	585.04	52.65	52.65	0.00	0.00	105.30
8544	10%	100.000	nos	1045.90	94.13	94.13	0.00	0.00	188.26
70312000	10%	10.000	nos	1442.70	129.05	129.05	0.00	0.00	258.10
99	10%	1.000	job	1239.50	111.56	111.56	0.00	0.00	223.12
Total	-	594.000	-	62374.75	5608.15	5608.15	0.00	0.00	11,216.30

Tax Breakup		Currency (INR)	
SALES @10%	60,886.47	Total	62,374.75
CGST @3%	5,479.70	Total RFC	1,111.56
IGST @3%	5,479.70	Total Tax	11,316.30
SALES @20%	1,400.30	Grand Total	74,315.10
CGST @14%	200.37		
IGST @14%	200.37		

Total INR: Seventy Four Thousand Three Hundred Seventy Five Only

Terms & Conditions

E. & O.E.

1. Goods once sold will not be taken back.
2. Interest @18% p.a. will be charged if the payment is not made within the stipulated time.
3. Subject to "ERNAKULAM" Jurisdiction only.
4. Freight extra as actuals

BANK DETAILS:

Bank Name: AXIS BANK
 Address: Door No: 39 A609, Ground Floor, Oxford Business Centre,
 Oxford Business Center, OFF, M.G. Road
 Branch Name: Ravipuram
 Account Number: 9180 300 0054 0057
 SWIFT: AXIS INBB 001 IFSC: ULID 000 1459

Travelling

70856

For Tomson Electronics

Edecenty monitoring systems

PRINCIPAL
VIMAL JYOTHI ENGINEERING COLLEGE
CHEMPERI - 670 632

[Signature]
Accounts Officer
Vimal Jyothi Engineering College
CHEMPERI

Customer's Signature