

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
**BELAGAVI - 590018**  
**2019 –2020**



**A**  
**Project Work**  
**on**  
**“OTA Based 2<sup>nd</sup> Order Butterworth Filter for**  
**Mobile Communications using CMOS Technology”**

**Submitted in the complete fulfillment of the requirement**  
**for the VIII Semester Project Work 15ECP85 for the award of degree of**

**Bachelor of Engineering**  
**in**  
**Electronics and Communication Engineering**  
**by**

<b>AKSHITHA K</b>	<b>1GV16EC003</b>
<b>DIVYASHREE M G</b>	<b>1GV16EC012</b>
<b>NAGAKRUPA B R</b>	<b>1GV16EC030</b>
<b>SINDHU J K</b>	<b>1GV16EC057</b>

**Carried at**  
**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Under the Guidance of**  
**Mrs. VIJAYA BHARATHI M, M. Tech,**  
**Associate Professor**  
**Dept of ECE, Dr. TTIT, KGF**



**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**  
**(Formerly Golden Valley Institute of Technology)**  
**Department of Electronics and Communication Engineering**  
**Oorgaum, Kolar Gold Fields – 563210**

# Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY



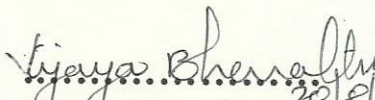
(Formerly Golden Valley Institute of Technology)

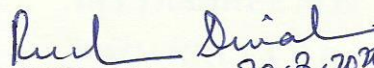
Oorgaum Kolar Gold Fields – 563120

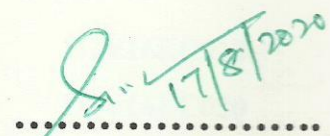
DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING.

## CERTIFICATE

Certified that the Project Work entitled ***“OTA Based 2<sup>nd</sup> Order Butterworth Filter for Mobile Communication using CMOS Technology”*** is a bonafied work carried out by Akshitha K. -1GV16EC003, Divyashree M G. -1GV16EC012, Nagakrupa B R. -1GV16EC030 and Sindhu J K. - 1GV16EC057 in the complete fulfillment for the award of degree of Bachelor of Engineering in **Electronics and Communication Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2019- 2020**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Work 15ECP85** prescribed for the Bachelor of Engineering Degree.

  
Signature of guide  
Prof. Vijaya Bharathi.M

  
Signature of HOD  
Prof. Ruckmani Divakaran

  
Signature of Principal  
Dr. Syed Ariff  
PRINCIPAL

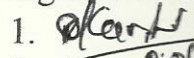
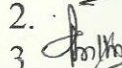

Head of the Department  
Dept. of Electronics & Communication Engg.  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K.G.F. - 563 120.

Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K. G. F - 563120

Name of Examiners

1. Rajesh Kumar (Keesha)
2. VESAYA GEETHA R
- 3.

Signature with Date

1.  20/8/2020
2.  20/8/2020
3.  19/8/2020

## **SYNOPSIS**

Communication is the act of conveying information from one entity to another. When we say communication; obviously it includes two major components that is receiver and transmitter. Receivers play vital role in communication. The major function of receiver is to reproduce the message signal in electrical form from the distorted received signal.

Receivers accept signals, such as radio waves and convert them into useful form. In our project we are designing a 2nd order Butterworth filter by using OTA for the mobile communication. The type of receiver we are concentrated is Direct Conversion Receiver (DCR) that converts the signal directly down to the baseband frequency. In this project we are concentrating on the Low Pass filter to block unwanted signals from mixer stage.

A 2nd order Butterworth filter can be designed by priority implementing a differential amplifier with active load & a common source amplifier with active load, further the operational transconductance is designed by using the above mentioned two circuits. The designed OTA is implemented with a Gm-c filter for the better efficiency.

We are designing this 2nd order Butterworth filter using OTA to reduce the roll off factor and without compromising other filter parameters.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

Belagavi - 590018

**2019 –2020**



**A**

**Project Report**

on

***“Skin Cancer Recognition and Detection Using Machine Learning Algorithm”***

Submitted in the partial fulfillment of the requirement  
for the VIII Semester Project Work- 15ECP85 for the award of degree of

**Bachelor of Engineering**

in

**Electronics and Communication Engineering**

by

**AMRUTHA G.  
KISHORE K L.  
ROHAN K R.  
SAGAR S N.**

**1GV16EC005  
1GV16EC022  
1GV16EC045  
1GV16EC047**

**Carried at**

**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Under the Guidance of**

**Mrs. JENITHA.A, M.E., (Ph.D.)**

**Associate Professor**

**Dept of ECE, Dr. TTIT, KGF**



**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**(Formerly Golden Valley Institute of Technology)**

**Department of Electronics and Communication Engineering**

**Oorgaum, Kolar Gold Fields – 563210**



# Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY



(Formerly Golden Valley Institute of Technology)

Oorgaum Kolar Gold Fields – 563120

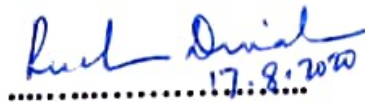
DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING

## CERTIFICATE

Certified that the Project Work entitled "*Skin Cancer Recognition And Detection Using Machine Learning Algorithm*" is a bonafied work carried out by **AMRUTHA G. -1GV16EC005, KISHORE K L. - 1GV16EC022, ROHAN K R. - 1GV16EC045 and SAGAR S N. - 1GV16EC047** in the partial fulfillment for the award of degree of Bachelor of Engineering in **Electronics and Communication Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Work -15ECP85** prescribed for the Bachelor of Engineering Degree.

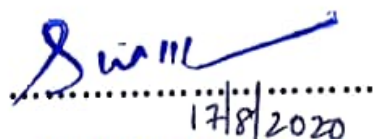
  
17/8/2020

Signature of Guide  
Prof. Jenitha.A

  
17/8/2020

Signature of HOD  
Prof. Ruckmani Divakaran

Head of the Department  
Dept. of Electronics & Communication Engg.  
Dr. T.Thimmaiah Institute of Technology  
Oorgaum, K.G.F.- 563 120.



  
17/8/2020

Signature of Principal  
Dr. Syed Ariff

Name of Examiners

1. VIJAYA GEETHA R
2. Rajesh Kumar Karsal

Signature, with Date

1.   
17/8/2020
2.   
17/8/2020

## **SYNOPSIS**

Melanoma is one of the most commonly detected skin cancers and the most dangerous one because it causes the most of skin cancer deaths. Melanomas are mostly caused by exposure to ultraviolet radiation that damages the DNA of skin cells. If skin cancer is detected in earlier stage it can be cured. In our project, we concentrate on the identification of skin cancer caused by one of the above-mentioned areas. The skin images are taken from a medical database which is a pre-processed image, which is given as input for different machine learning algorithm. The algorithm used is KNN classifier, SVM classifier, and CNN model. where these classifiers will classify whether a given image is cancerous or non-cancerous image. In case of the KNN and SVM the output is 80%, hence in CNN model substantial improvement in accuracy of cancer detection is obtained & it can classify the cancerous & Non-cancerous images efficiently.

The experiment was conducted on images of test data, training data and validation data using a different number of images and for 100 epochs in the training process. The experiment obtained the highest accuracy of **97%** in training result. Meanwhile, in testing result obtained is **95%** of accuracy and **96%** for validation testing. In the section of training data, test data and validation set, where length of training data was 360, length of test data was 50 and length of validation set is 90. Each of the training data section was trained with 100 epochs.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
BELAGAVI - 590018  
2019-2020



**A**  
**Project Phase-1 Report**  
**On**  
**“DESIGN OF WSN NODE FOR FOREST TREES AGAINST**  
**POACHING USING IOT”**

Submitted in the partial fulfillment of the requirement  
For the VII Semester Project Work Phase-1 15ECP78 for the award of degree of

**Bachelor of Engineering**

**In**

**Electronics and Communication Engineering**

**By**

**AKSHAYAKUMAR.MASHAL**

**1GV16EC004**

**DINESH. N**

**1GV16EC011**

**KRISHNA.G. KATWA**

**1GV16EC023**

**SUNIL KUMAR.R. C**

**1GV16EC063**

**Carried at**

**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Under the Guidance of**

**Dr. K M PALANISWAMY**

**Professor,**

**Dept. of ECE, Dr. TTIT. K.G.F.**



**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**  
(Formerly Golden Valley Institute of Technology)  
**Department of Electronics and Communication Engineering**  
**Oorgaum, Kolar Gold Fields – 563210**

# Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY



(Formerly Golden Valley Institute of Technology)

Oorgaum Kolar Gold Fields – 563120

DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING.

## CERTIFICATE

Certified that the **Project Phase-1** entitled *“Design of WSN node for forest trees against poaching using IoT”* is a bonafied work carried out by **AKSHAYAKUMAR MASHYAL -1GV16EC004, DINESH N - 1GV16EC011, KRISHNA G KATWA -1GV16EC023 and SUNIL KUMAR R C -1GV16EC063** in the partial fulfillment for the award of degree of Bachelor of Engineering in **Electronics and Communication Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year 2019- 2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Phase-1 - 15ECP78** prescribed for the Bachelor of Engineering Degree.

.....  
Signature of Guide  
Dr.KM Palaniswamy

.....  
Signature of HOD  
Prof.Rukmani  
Divakaran

.....  
Signature of Principal  
Dr. Syed Ariff  
PRINCIPAL

**Head of the Department**

**Dept. of Electronics and Communication Engg.**

**Dr. T.Thimmaiah Institute of Technology**  
**Oorgaum, K.G.F. - 563 120.**

**Dr. T. Thimmaiah Institute of Technology**  
**Oorgaum, K.G.F. - 563 120.**

Name of Examiners

1. TAMIL VANU R
2. MANJU SHREE K CHAVAN .

Signature with Date

1. 3/12/19.
2. Manju Shree K Chavan  
3/12/19.



## **ABSTRACT**

Smuggling/theft of most important trees such as sandal wood in forests, poses a serious threat to forest resources, causes significant economic damage and ultimately has quite a devastating effect on the environment all over the world. These trees are very costly as well as less available in the world. These are used in medical sciences as well as cosmetics. Because of huge amount of money involved in selling of such trees smuggling occurs. This paper proposes a microcontroller based anti-poaching system employing WSN technology, which is capable of detecting theft by monitoring the vibrations produced by the cutting of trees/branches using a 3 axis MEMS accelerometer. WSN is widely used technology in remote monitoring applications. Due to nature disaster some trees may fallen and create some sounds for that purpose we are using GPS module for continuous monitoring of trees location. The embedded system architecture and the hardware/software designs are described in detail. Vibration data collected by various tests on wood and simulated. It is also used along with the IOT modules to communicate to a central server from a remote place.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**BELAGAVI - 590018**

**2019 -2020**



**A**

**Project Report**

**on**

**“A Stratified Approach To Detach Rain And Blizzard  
In A Color Image”**

**Submitted in the partial fulfillment of the requirement  
for the VIII Semester Project Work - 15ECP85 for the award of degree of**

**Bachelor of Engineering**

**in**

**Electronics and Communication Engineering**

**by**

**KAVITHA S B**

**1GV16EC018**

**KEERTHANA P**

**1GV16EC021**

**MEENA R**

**1GV16EC026**

**Carried at**

**Dr. T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Under the Guidance of**

**Mrs. Manjushree K Chavan**

**Assistant Professor**

**Dept. of ECE, Dr. TTIT., K.G.F.**



**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

**(Formerly Golden Valley Institute of Technology)**

**Department of Electronics and Communication Engineering**

**Kolar Gold Fields – 563120.**



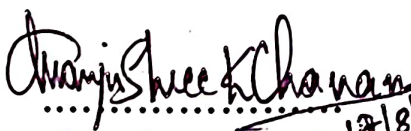
(Formerly Golden Valley Institute of Technology)

Oorgaum, Kolar Gold Fields – 563120

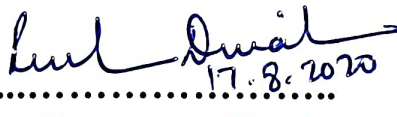
DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING.

### CERTIFICATE

Certified that the Project Work entitled "*A Stratified Approach to Detach Rain and Blizzard in a Color Image*" is a bonafied work carried out by KAVITHA S B - 1GV16EC018, KEERTHANA P-1GV16EC021, and MEENA R -1GV16EC026 in the partial fulfillment for the award of degree of Bachelor of Engineering in **Electronics and Communication Engineering** of the Visvesvaraya Technological University, Belagavi during the year 2019- 2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Work -15ECP85** prescribed for the Bachelor of Engineering Degree.

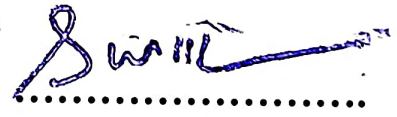
  
.....  
Signature of guide

Mrs. Manjushree K Chavan

  
.....  
Signature of HOD

Prof. Rukmani Divakaran  
Head of the Department

Dept. of Electronics and Communication Engg. Dr. T. Thimmaiah Institute of Technology  
Dr. T. Thimmaiah Institute of Technology Oorgaum, K. G. F- 563120  
Oorgaum, K.G.F.- 563 120.

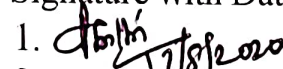
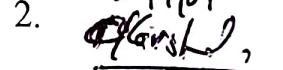
  
.....  
Signature of Principal

Dr. Syed Ariff  
PRINCIPAL

Name of Examiners

1. VIJAYA G EBITHA R
2. Rajesh Kumar Koushal

Signature with Date

1.  17/8/2020
2.  17/8/2020

## SYNOPSIS

Visual distortions on images caused by bad weather condition such as rain and snow have a negative impact on the performance of many outdoor vision systems.

The proposed system removes rain and blizzard from a color image. The algorithm consists of two steps. In the first step, the input image is decomposed into the low frequency part ( $I_L$ ) and high-frequency part ( $I_H$ ). The  $I_L$  is free of rain or blizzard almost completely, while  $I_H$  contains rain/snow components and some or even many details of the image. In the second step, A 3-layer hierarchy of extracting image details from the high frequency part has been designed. In the first layer, an over-complete dictionary is trained and three classifications are carried out to classify the high-frequency part into rain/blizzard and non-rain/ blizzard components. In the second layer, another combination of rain/snow detection and guided filtering is performed on the rain/snow component obtained in the first layer. In the third layer, the sensitivity of variance across color channels (SVCC) is computed to enhance the visual quality of rain/blizzard-removed image.



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
**BELAGAVI - 590018**  
**2019 –2020**



**A**  
**Project Report**  
**on**  
**“HEART DISEASE PREDICTION USING MACHINE**  
**LEARNING BASED INTELLIGENT SYSTEM”**

**Submitted in the partial fulfillment of the requirement**  
**for the VIII Semester Project - 15ECP85 for the award of degree of**

**Bachelor of Engineering**  
**in**  
**Electronics and Communication Engineering**  
**by**

<b>KEERTHI .G</b>	<b>1GV15EC014</b>
<b>SHALINI . R</b>	<b>1GV16EC050</b>
<b>SUMAIYA FATHIMA</b>	<b>1GV16EC062</b>
<b>KANCHANA . K</b>	<b>1GV16EC402</b>

**Carried at**  
**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Under the Guidance of**  
**Assistant Prof. S.SHASHI KIRAN**  
**Dept. of ECE, Dr.TTIT., K.G.F.**



**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**  
**(Formerly Golden Valley Institute of Technology)**  
**Department of Electronics and Communication Engineering**  
**Kolar Gold Fields – 563120**




(Formerly Golden Valley Institute of Technology)


Oorgaum Kolar Gold Fields – 563120


DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING.

### CERTIFICATE

Certified that the Project Work entitled **“Heart Disease Prediction Using Machine Learning Based Intelligent System”** is a bonafied work carried out by **KEERTHI G. – 1GV15EC014, SHALINI R. – 1GV16EC050, SUMAIYA FATHIMA. – 1GV16EC062, KANCHANA K. – 1GV16EC402**, in the partial fulfillment for the award of degree of Bachelor of Engineering in **Electronics and Communication Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2019 - 2020**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Work - 15ECP85** prescribed for the Bachelor of Engineering Degree.

  
.....  
Signature of Guide  
Mr. Shashikiran S

  
.....  
Signature of HOD  
Prof. Ruckmani Divakaran  
Head of the Department

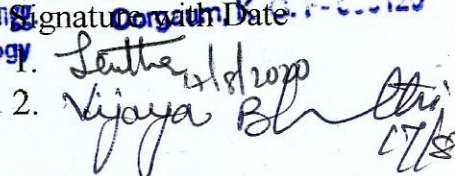
  
.....  
Signature of Principal  
Dr. Syed Ariff

Name of Examiners

1. JENITHA A
2. Vijaya Bharathi

Dept. of Electronics and Communication Engineering  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K.G.F.- 563 120.

Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K.G.F.- 563 120

  
.....  
Signature of Examiner  
Vijaya Bharathi

## **SYNOPSIS**

Heart disorder is one of the most complicated and life threatening disease, when we talk about detection of diseases related to heart it has to be done very efficiently as it is the basis on which the entire treatment process will be decided. This project proposes the systematic process for predicting and diagnosing the cardio vascular disease and few more diseases of the heart. In this project work our concentration is on predicting and diagnosing the heart disorder using k-means algorithm which provides various significant attributes in the medical literature

Those attributes are been used in the algorithm along with an dependent variable which can have the values 0 or 1( i.e. test positive or negative).The number of peoples taking up the test will be divided into a required ratio (eg:80:20) out of which 80 will be given for training model and 20 will be given for the testing model. The data base which will be collected from the medical organization will be compared with the training components and here the patients will be categorized .The classified output will be given to the testing model which will compare this result with the result generated by the dependent variable when these values matches the heart disorders will be predicted with good accuracy.

## **CONTENT**

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**BELAGAVI - 590018**

**2019 –2020**



**A**

**Project Phase-II Report**

**on**

**“Perceptual Image Hashing based on Texture and Color”**

**Submitted in the partial fulfillment of the requirement for the  
VII Semester Project - 15ECP78 for the award of degree of  
Bachelor of Engineering**

**In**

**Electronics and Communication Engineering**

**By**

**NITHYA K.  
PAVITHRA G.  
SHIKHA K.**

**1GV16EC032  
1GV16EC043  
1GV16EC054**

**Carried at**

**Dr .T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Under the Guidance of**

**Guide**

**Miss. Tamilvani R  
Assistant Professor**

**Co-Guide**

**Miss. Mohana C.  
Assistant Professor**

**Dept. of ECE, Dr.TTIT, K.G.F.**



**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY  
(Formerly Golden Valley Institute of Technology)**

**Department of Electronics and Communication Engineering  
Kolar Gold Fields – 563120.**



# Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY




(Formerly Golden Valley Institute of Technology)

Oorgaum Kolar Gold Fields – 563120

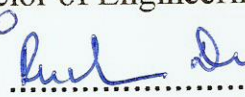
DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING.

## CERTIFICATE

Certified that the Project Work phase-II entitled "*Perceptual Image Hashing based on Texture and Color*" is a bonafied work carried out by Nithya K. -1GV16EC32, Pavithra G. -1GV16EC034 and Shikha K. – 1GV16EC054 in the partial fulfillment for the award of degree of Bachelor of Engineering in Electronics and Communication Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019- 2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of Project Work phase-II 15ECP78 prescribed for the Bachelor of Engineering Degree.

 18/8/2020

Signature of guide  
Miss. Tamilvani R.  
Assistant Professor

 12.8.2020

Signature of HOD  
Prof. Rukmani Divakaran

Head of the Department

Dept. of Electronics and Communication Engineering  
Dr T.Thimmaiah Institute of Technology  
Oorgaum, K.G.F.- 563 120.

 17/8/2020

Signature of Principal  
Dr.Syed Ariff


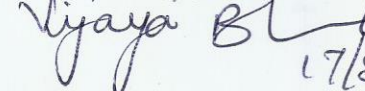
PRINCIPAL

Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K. G. F- 563120

Name of Examiners

1. JENITHA A
2. Vijaya Bhanu

Signature with Date

1.  17/8/2020
2.  17/8/2020

## **SYNOPSIS**

This paper proposes an efficient scheme for generating image hashing by combining the local texture and color angle features. During the stage of texture extraction, using Weber's Law, the difference ratios between the center pixels and their surrounding pixels are calculated and the dimensions of these values are further reduced by applying principal component analysis to the statistical histogram. In the stage of color feature extraction, the color angle of each pixel is computed before dimensional reduction and is carried out using a discrete cosine transform and a significant coefficients selection strategy.

The main contribution of this paper is a novel construction for image hashing that incorporates texture and color features by using Weber local binary pattern and color angular pattern. The experimental results demonstrate the efficacy of the proposed scheme, especially for the perceptual robustness against common content preserving manipulations, such as the JPEG compression, Gaussian low-pass filtering, and image scaling. Based on the comparisons with the graphs, the integrated histograms of normalized distances show the superiority of the scheme in terms of robustness and discrimination.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**BELAGAVI - 590018**

**2019 –2020**



**A**

**Project Work**

**on**

**“IoT Based Automatic Control of Sun Tracking Solar Panel for High Power Generation”**

**Submitted in the partial fulfillment of the requirement for the VIII Semester Project - 15ECP85 for the award of degree of**

**Bachelor of Engineering**

**in**

**Electronics and Communication Engineering**

**by**

**PAVITHRA N 1GV16EC033**

**PRIYA D 1GV16EC037**

**RAMYA B Y 1GV16EC040**

**DHARSHINI R 1GV17EC401**

**Carried out at**

**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Sponsored by KSCST**

**Under the Guidance of**

**Prof. Ruckmani Divakaran,  
HOD and Dean (Administration)**

**Dept. of ECE, Dr.TTIT, K.G.F.**

**Nandini G N(Co-Guide)  
Assistant Professor**

**Dept.of ECE,Dr.TTIT,K.G.F.**



**Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY**

**(Formerly Golden Valley Institute of Technology)**

**Department of Electronics and Communication Engineering**

**Kolar Gold Fields – 563120.**



# Dr.T.THIMMAIAH INSTITUTE OF TECHNOLOGY



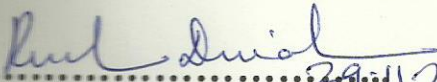
(Formerly Golden Valley Institute of Technology)

Oorgaum Kolar Gold Fields – 563120

DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING.

## CERTIFICATE

Certified that the Project Work entitled “*IoT Based Automatic Control Of Sun Tracking Solar Tracking Solar Panel For High Power Generation*” is a bonafied work carried out by Pavithra N. - 1GV16EC033, Priya D. - 1GV16EC037, Ramya B Y. - 1GV16EC040 and Dharshini R. - 1GV17EC401 in the partial fulfillment for the award of degree of Bachelor of Engineering in **Electronics and Communication Engineering** of the **Visvesvaraya Technological University, Belagavi** during the year **2019- 2020**. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Work Phase I- 15ECP78** prescribed for the Bachelor of Engineering Degree.

  
.....29.11.2019


Signature of HOD and guide  
Prof. Ruckmani Divakaran

**Head of the Department**

Dept. of Electronics and Communication Engg.  
Dr. T.Thimmaiah Institute of Technology  
Oorgaum, K.G.F.- 563 120.

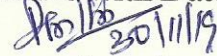

Name of Examiners

1. VIJAYA GEETHA R
2. Tamilvan. R.

  
.....29/11/19

Signature of Principal  
Dr. Syed Ariff  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K.G.F. - 563 120.

Signature with Date

1.  30/11/19
2.  30/11/19.



## **ABSTRACT**

The conversion of sun light into electric energy through solar panels is significant compared to other renewable sources. The energy extracted from the solar panel depends on solar light incident on the solar panel, but the constant variation in the sun's position decreases the power generation efficiency. In order to extract maximal energy, the solar panel should face the sunlight at normal angle throughout the day. Solar tracker tilts the panel towards the sun light direction.

The automatic sun tracking solar panel will harness a significant amount of energy from available sun light. Single axis type of solar tracker is used which has one degree of freedom of rotation. Closed loop tracking approach is used with LDR's, an ATmega2560 microcontroller and a DC motor forming the principal components of the circuit model. Based on the signals generated from LDR's, microcontroller provides signals to the motor for tilting the solar panel towards the direction of maximum incident sun rays, which will increase the power generation efficiency. The efficiency of the proposed system is 71%. The information regarding status of solar tracking system is shared through IoT.

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
**BELAGAVI – 590018**  
**2019 –2020**



**A**  
**Project Report**  
**on**

**“Eco-Friendly and self powered IoT using Piezoelectric  
Energy Harvesting”**

**Submitted in the partial fulfillment of the requirement for the  
VIII Semester Project - 15ECP85 for the award of degree of**

**Bachelor of Engineering**

**in**

**Electronics and Communication Engineering**

**by**

**RITHICK G**

**1GV16EC044**

**SAGAR A N**

**1GV16EC046**

**SAI SUSHANTH L A**

**1GV16EC048**

**SANTHOSH KUMAR P**

**1GV16EC049**

**carried at**

**DR. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Under the guidance of**  
**RAJESH KUMAR KAUSHAL**  
**Assistant Professor**  
**Dept of ECE, Dr. TTIT, KGF**



**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**  
**(Formerly Golden Valley Institute of Technology)**  
**Department of Electronics and Communication Engineering**  
**Kolar Gold Fields – 563120**



(Formerly Golden Valley Institute of Technology)

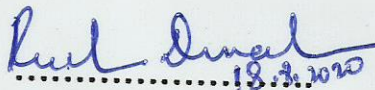
Oorgaum Kolar Gold Fields – 563120


DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING

**CERTIFICATE**


Certified that the Project Work entitled *“Eco-friendly and self powered IoT using Piezoelectric energy harvesting”* is a bonafide work carried out by **Rithick G. - 1GV16EC044**, **Sagar A N. - 1GV16EC046**, **Sai Sushanth L A. - 1GV16EC048**, **Santhosh Kumar P. - 1GV16EC049** in the partial fulfillment for the award of degree of Bachelor of Engineering in **Electronics and Communication Engineering** of the **Visvesvaraya Technological University**, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of **Project Work - 15ECP85** prescribed for the Bachelor of Engineering Degree.


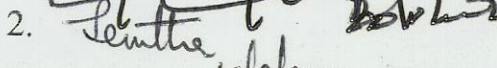
.....  
Signature of guide  
**Asst. Prof. Rajesh  
Kumar Kaushal**

  
.....18.3.2020  
Signature of HOD  
**Prof. Ruckmani  
Divakaran**

  
.....17/3/2020  
Signature of  
**Principal  
Dr. Syed Ariff**  
**PRINCIPAL**

Name of Examiners

1.   
2. **JENITHA A**

**Dr. T. Thimmaiah Institute of Technology**  
**Oorgaum Kolar Gold Fields - 563120**  
Signature of Examiners Date  
1.   
2.   
18/3/2020

## **SYNOPSIS**

The Internet of Things (IoT) is a revolutionizing technology which aims to create an ecosystem of connected objects and embedded devices and provide ubiquitous connectivity between trillions of not only smart devices but also simple sensors and actuators. Although recent advancements in miniaturization of devices with higher computational capabilities and ultra-low power communication technologies have enabled the vast deployment of sensors and actuators everywhere, such an evolution calls for fundamental changes in hardware design, software, network architecture, data analytics, data storage, and power sources.

A large portion of the IoT devices cannot be powered by batteries only anymore, as they will be installed in hard to reach areas and regular battery replacement and maintenance are infeasible. A viable solution is to scavenge and harvest energy from the environment and then provide enough energy to the devices to perform their operations. This will significantly increase the device life time and eliminate the need for the battery as an energy source.

This project presents the main design challenges of the IoT devices in terms of energy and power and provide design considerations for a successful implementation of self-powered IoT devices. We then specifically focus on piezoelectric energy harvesting as one of the most promising solutions to power the IoT devices and present the main challenges and research directions.



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**BELAGAVI - 590018**

**2019 –2020**



**A**

**Project Report**

**on**

**“A Disaster Monitoring Technique of: Iceberg Movement  
Detection Using Active Sensor Images”**

**Submitted in the partial fulfillment of the requirement for the  
VIII Semester Project - 15ECP85 for the award of degree of**

**Bachelor of Engineering**

**in**

**Electronics and Communication Engineering**

**by**

**SHAMBHAVI K**

**1GV16EC052**

**SOUMYA C**

**1GV16EC060**

**SUSHMITHA GANIG M**

**1GV16EC064**

**YESHWITHA J**

**1GV16EC070**

**Carried at**

**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**Under the Guidance of**

**Prof. VIJAYA GEETHA R, M.E., (Ph.D.)**

**Associate Professor., Dept. of ECE,**

**Dr.TTIT, K.G.F.**



**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**

**(Formerly Golden Valley Institute of Technology)**

**Department of Electronics and Communication Engineering**

**Kolar Gold Fields – 563120.**



(Formerly Golden Valley Institute of Technology)  
Oorgaum, Kolar Gold Fields – 563120

DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING

CERTIFICATE

Certified that the Project Work entitled "*A Disaster Monitoring Technique of: Iceberg Movement Detection Using Active Sensor Images*" is a bonafied work carried out by SHAMBHAVI K. -1GV16EC052, SOUMYA C. -1GV16EC060, SUSHMITHA GANIG M. -1GV16EC064 and YESHWITHA J. -1GV16EC070 in the partial fulfillment for the award of degree of Bachelor of Engineering in Electronics and Communication Engineering of the Visvesvaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for the assessment have been incorporated in the report deposited in the departmental library. The Project report has been approved as it satisfies the academic requirement in respect of Project Work-15ECP85 prescribed for the Bachelor of Engineering Degree.

.....  
Signature of Guide  
Prof. Vijaya Geetha R

.....  
Signature of HOD  
Prof. Ruckmani Divakaran

.....  
Signature of Principal  
Dr. Syed Ariff

Signature of Guide  
Prof. Vijaya Geetha R

Signature of HOD  
Prof. Ruckmani Divakaran

Signature of Principal  
Dr. Syed Ariff  
PRINCIPAL

Name of Examiners

1. JENITHA A
2. Vijaya Bharathi

Head of the Department  
Dept. of Electronics & Communication Engineering  
Dr. T. Thimmaiah Institute of Technology  
Oorgaum, K.G.F. - 563 120.

Dr. T. Thimmaiah Institute of Technology  
Signature with Date  
Oorgaum, K. G. F. - 563120

1. Jenitha A
2. Vijaya Bharathi

## **ABSTRACT**

Disaster monitoring is an important aspect of global change. This work initiates image-based investigation of iceberg movement detection caused by disaster impact due to global warming and tsunami effect. Satellite images are emerged for rapid testing and make aware of continuous monitoring of catastrophe area. Synthetic aperture Radar (SAR) images are utilized for Climate convenience. SAR images are affected by some sort of noise called as speckle. This speckle noise influenced by reflections of electromagnetic features and needed to remove for post processing stages. Pre-processing stage is done with adaptive filter to remove speckle. Then, images from two instances of time is compared and implemented with Gabor based multi-scale algorithm. The different scale responses are summed together. Binary thresholding algorithm is used to classify the before and after iceberg migration. The proposed algorithm is examined by two SAR images are Tohoku and Pine dataset, and also secured accuracy of 97.80% and 97.44% respectively. This algorithm provides excellent iceberg migration accuracy and perfect edges of broken ice.