3.2.1 The Institution has created an ecosystem for innovations including incubation center and other initiatives for creation and transfer of knowledge.

The Management of Sapthagiri College of Engineering is very supportive in creating a suitable environment for research and entrepreneurship. It nurtures the curiosity and ideas of the researchers and entrepreneurs. The college providesa suitable space along with the required infrastructure and also helps for exchange of information between research centers.

The college provides a high speed internet facility(100Mbps) for both faculty and students. This is achieved by providing LAN and Wi-Fi facilities throughout the college campus. The college has an excellent library consisting of 28689 volumes 5734titles of Research, Technical and Management books. The library also has e-books, conference journals, IEEE journals and supportive material for research which can be used by the students, faculty and researchers. Thus the institution caters the need for materials for research scholars.

The college also has an R & D, Entrepreneurship Committee and Incubation centre (RDECI) which encourages the young engineers and Faculty. Research Methodology, IPR and Entrepreneurship workshops are conducted which provides a base for researchers. Research guides motivate the researchers and guide them in all the phases of their work. Research grant is provided for all eligible research scholars.

The Incubation Center is a platform for young engineers for all the fields. The research/project outcome helps mankind in general. Project funds are also provided to the deserving students.

Different departments in the college encourage students to participate in various competitions at National/International level every year. Students are taking these innovative projects with interest and have won awards and good appreciation everywhere they participated.

Innovative Projects made by the Students of different Departments of Engineeringare as follows.

- **Multi-Robot System to Render Service and Surveillance in Hospital.**
  This will deliver water bottles, newspapers and magazines to the in-patients and surveillance of the environment for fire hazards.
- **Insect Inspired Hexapod with Audio-Video and IR Features:-**
  Students have designed Insect Inspired Hexapod with Audio-Video and IR Feature which has been awarded 3rd prize at SRISHTI-2018.
- **SNAPS**
  In this project fruit peels are used which act as absorbent of toxic metals which is used to reduce the pollution in lakes.
- **Team Torque Racing**
  The team has fabricated a racing car and raced with 160 other teams from all over country and awarded with MOST DYNAMIC BALANCED KART AWARD in “ELITE RACING 2017”.

- **Modification of Bajaj Chetak into Electric Scooter**
  An old Bajaj Chetak scooter was converted into an electrical vehicle by modifying the existing components.
- **Multi Purpose agricultural equipment**
  Design and fabrication of multipurpose equipment which is used for land preparation, sowing, fertilizing and leveling.
- **Blind man Smart Stick**
  An innovative Blind man Smart Sticks been designed for visually disabled people for improved navigation.
- **System for Swift Passage Ambulances through Traffic Lights Junctions**
  This project brings out a simple solution for swift movement of ambulances in a highly dense traffic condition which was appreciated in the press meet on 26th June 2019.
- **Design and Fabrication of Articulated 3-D printer**
  The project introduces the implementation of a low-cost 3D printing Robotic Arm which was show cased and well appreciated at the press meet, Bangalore in June 2019.
- **Digital clock with LED hands**
  A satellite controlled Digital clock with LED hands was well appreciated in the project expo and was published in all the leading newspapers on 3rd August 2019.

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A PROJECT REPORT

On

MULTI-ROBOT SYSTEM TO RENDER SERVICE AND SURVEILLANCE IN HOSPITALS

Submitted to

Visvesvaraya Technological University

Belagavi, Karnataka – 590014

in Partial fulfillment for the award of degree in

Bachelor of Engineering

During VIII Semester of

Electronics and Communication Engineering

for the academic year ***2016-17***

Submitted by

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Under the guidance of

Mr. KARTHIK N.C.

Lecturer, Department of E.C.E.

SAPTHAGIRI
College of Engineering
Creating Tommorow

2016-17

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SAPTHAGIRI COLLEGE OF ENGINEERING

14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru– 560057

Principal
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SAPTHAGIRI
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Department of Electronics and Communication Engineering

CERTIFICATE

Certified that the project work entitled **"MULTI-ROBOT SYSTEM TO RENDER SERVICE AND SURVEILLANCE IN HOSPITALS"** carried out by Ms.Lavanya M. (1SG13EC044), Mr.M. Abhilash (1SG13EC045), Ms.Nethravathi V. (1SG13EC062), Ms. Nisha K. Merta (1SG13EC064) bonafide students of 8th Semester Electronics and Communication Engineering in partial fulfillment for the award of **Bachelor of Engineering** in Sapthagiri College of Engineering of the Visvesvaraya Technological University, Belagavi during the year 2016-17. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Signature of the Guide	Signature of the HOD	Signature of the Principal
Mr. Karthik N.C. Lecturer, Dept of E.C.E., S.C.E.	07/06/2017 Prof. Sandhya Rani M.H. Associate professor and HOD Dept of E.C.E., S.C.E.	06/6/17 Dr. Aswatha Kumar M. Principal S.C.E.

Head of the Department
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Dr. Aswatha Kumar. M
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Name of the examiners	Signature with date
1. Sandhya Rani M.H.	24/06/17
2. Dr T.S. Jayadeva	27/06/17

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ABSTRACT

The shortage of staff has been a major matter of concern from the past decade. Hospitals are overcrowded with patients and with stressed out workers which, leads to errors & patients waiting too long for assistance. This project brings out a technical solution to provide service such as delivery of water bottle & magazines to the in-patients and surveillance of the environment for fire hazards. In the proposed system, actuators, sensors and communication unit form a synergic solution. Ultrasonic sensors help to control the DC motors for actuation. A flame sensor is used to detect fire hazards and a buzzer is interfaced to alert the surrounding people in case of fire. For communication between robots, Zigbee is used. For long distance communication GSM is incorporated. The robots are attached with trays where in the newspapers or magazines are kept which will be taken to every bedside, for the patient to receive.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

A robot is an electromechanical device which is guided by a computer or an electronic programming. Robots were created for the simple human need to make work easier and the first robots being simple machines could perform a single task or fewer tasks. The advent of microprocessors and other integrated circuits have made the robots affordable. Such a progress in technology has led to the faster development in robotics over the years.

Swarm robotics is a branch of multi-robot systems that is inspired from the animals that behave in a group such as insects, ants and bees. The term "swarm" is used to refer to a large group of locally interacting individuals with common goals". To analyze potential capabilities of robot swarms, swarm robotics has been studied in the context of producing different collective behaviors to solve tasks such as aggregation, pattern formation, self-assembly and morphogenesis, object clustering, assembling and construction, collective search and exploration, coordinated motion, collective transportation, self-deployment, foraging and others. In our proposed project, we have reviewed the hardware architecture of robot swarm with self-deployment, self-assembly, and obstacle avoidance. The goal is to take inspiration from the existing swarm systems and translate some features into a multi-robotic system. The project includes design, hardware implementation, test and use of this type of self- deploying, self-assembling, obstacle avoiding and Prime-bot following multi-robotic systems.

The proposed project of multi-robot system is used for service and surveillance in hospitals. With more patients and less staff in many hospitals, there is increased probability of error. The main purpose of the project is to make the in-patients wait lesser for assistance by providing a completely economical, fully centralized system. The use of the microcontroller, various sensors, motors, Zigbee based wireless transceivers and GSM module enables a more efficient solution with very little human intervention.

Here, the whole operation is controlled by a controller, Xbee, some sensors and motors. Ultrasonic sensor and RF module guides the robot for its movement and flame sensor detects any kind of fire hazards during its course of movement. As, during the night time

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this surveillance is very much important. The robots are controlled by a central main robot, named as the Prime-bot. The Prime-bot gives commands to the sub-bots (S-bots) for self-deployment indicating the S-bots to disperse from the initial position in its respective direction and conduct the task it is been assigned. After the completion of the task, the robots self-assemble to its initial position. As there are many robots, in our case which is three, i.e, one Prime-bot and two S-bots, the time consumed to provide service to the in-patients and to scan the surrounding for fire is divided among the S-bots and hence reduced. Also, the efficiency is higher as there is less human intervention in this repetitive task. Nowadays as electronic products are cheaper, smaller, lighter in weight and easily available, which makes the multi-robot system more cost efficient, lighter in weight, and compact in size.

CHAPTER 9

CONCLUSION AND FUTURE SCOPE

The multi-robot system renders service by delivering supplies to each in-patient and is able to raise an alarm in the case of any fire detection. These modules built for servicing the patients and situation recognition can effectively contribute to improving hospital environment. They can also improve the working conditions of hospital staff and reduce staff shortages. The overall system is effective in terms of price and performance. Manufacturing cost would be low compared to the purchase cost of specialised service robots.

The proposed hardware architecture of robot swarm is designed, built and tested. The developed robot system uses centralized control strategies within the group of homogenous robots. The robot-to-robot and robot-to-environment interaction provides a full scale communication.

The algorithm used for path learning was found to be a suitable replacement for other existing navigation systems in which repetitive motion was persistent. Also, since no additional circuitry is involved in this algorithm, it can be easily used in the existing systems. Since a more accurate and less expensive technology is today's necessity, this algorithm will prove to be greatly applicable.

The proposed system can achieve more robustness, flexibility, scalability by adding sensors such as chemical sensors, wet sensor, speech recognition sensor, speaker, additional grippers and robot arms.

ಔಷಧಿ ಪೂರೈಸಲು ರೋಬೋಟ್

ಬೆಂಗಳೂರು: ಆಸ್ಪತ್ರೆಗಳಲ್ಲಿ ರೋಗಿಗಳ ಆರೈಕೆಗೆ ಶುಶ್ರೂಷಕಿಯರು ಇಲ್ಲದಿದ್ದರೂ ಇನ್ನು ಚಿಂತೆಪಡಬೇಕಿಲ್ಲ. ರೋಗಿಗಳಿಗೆ ಮಾತ್ರೆ, ಔಷಧ ಪೂರೈಸಲು ರೋಬೋಟ್‌ಗಳನ್ನೂ ಬಳಸಬಹುದು.

ಸಪ್ತಗಿರಿ ಎಂಜಿನಿಯರಿಂಗ್ ಕಾಲೇಜಿನ ವಿದ್ಯಾರ್ಥಿಗಳು ಇಂತಹ ರೋಬೋಟ್‌ಗಳನ್ನು ಅಭಿವೃದ್ಧಿಪಡಿಸಿದ್ದಾರೆ.

ಕಾಲೇಜಿನ ವಿದ್ಯಾರ್ಥಿಗಳಾದ ವಿನೇತ್ರಾವತಿ, ಕೆ.ನಿಶಾ, ಎಂ.ಲಾವಣ್ಯ, ಎಂ. ಅಭಿಲಾಷ್ ಅವರು ಉಪನ್ಯಾಸಕ ಕಾರ್ತಿಕ್ ಎನ್.ಸಿ. ಅವರ ಮಾರ್ಗದರ್ಶನದಲ್ಲಿ ಅಭಿವೃದ್ಧಿಪಡಿಸಿರುವ ಈ ಯಂತ್ರಗಳು ರೋಗಿಗಳಿಗೆ ಸೂಕ್ತ ಸಮಯಕ್ಕೆ ಔಷಧಿ ತಲುಪಿಸಬಲ್ಲವು.

ಈ ಕುರಿತು ಶನಿವಾರ ಇಲ್ಲಿ ಸುದ್ದಿಗೋಷ್ಠಿಯಲ್ಲಿ ಮಾಹಿತಿ ನೀಡಿದ ಕಾರ್ತಿಕ್, 'ರೋಬೋಟ್‌ಗಳನ್ನು ಎರಡು ವಿಧದಲ್ಲಿ ವಿನ್ಯಾಸ ಮಾಡಿದ್ದೇವೆ. ಮೊದಲನೆಯದು ಕೇಂದ್ರೀಕೃತ ರೋಬೋಟ್. ಇದರ ಸಹಾಯದಿಂದ ಇತರ ರೋಬೋಟ್‌ಗಳಿಗೆ ನಿರ್ದೇಶನ ನೀಡಬಹುದು, ಇದರ ಆದೇಶದಂತೆ ಉಳಿದವು ಕಾರ್ಯನಿರ್ವಹಿಸುತ್ತವೆ. ಇದು ಏಕಕಾಲದಲ್ಲಿ 100 ಚಿಕ್ಕ ರೋಬೋಟ್‌ಗಳನ್ನು ನಿಯಂತ್ರಿಸುವ ಸಾಮರ್ಥ್ಯ ಹೊಂದಿದೆ' ಎಂದು ತಿಳಿಸಿದರು.

'ಸದ್ಯಕ್ಕೆ ಆಸ್ಪತ್ರೆಯಲ್ಲಿ ಬಳಸಲು ಸಹಕಾರಿ ಆಗುವಂತೆ ಈ ಯಂತ್ರಗಳನ್ನು ವಿನ್ಯಾಸಗೊಳಿಸಲಾಗಿದೆ. ಭವಿಷ್ಯದಲ್ಲಿ ಶಿಕ್ಷಣ ಸೇರಿದಂತೆ ವಿವಿಧ ಕ್ಷೇತ್ರಗಳಿಗೂ ಅನ್ವಯವಾಗುವಂತಹ ರೋಬೋಟ್‌ಗಳನ್ನು ಅಭಿವೃದ್ಧಿಗೊಳಿಸುತ್ತೇವೆ' ಎಂದು ತಿಳಿಸಿದರು.

ವಿದ್ಯಾರ್ಥಿಗಳಾದ ಕೆ.ನಿಶಾ, ವಿನೇತ್ರಾವತಿ, ಎಂ.ಲಾವಣ್ಯ ಅವರು ರೋಬೋಟ್‌ಗಳನ್ನು ಪ್ರದರ್ಶಿಸಿದರು. ಎಂ.ಅಭಿಲಾಷ್ ಮತ್ತು ಮಾರ್ಗದರ್ಶಕರಾದ ಪ್ರಶಾಂತ್ ಹಾಗೂ ಕಾರ್ತಿಕ್ ಎನ್.ಸಿ. ಇದ್ದರು

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సాక్షి
అక్టోబర్ | 29 | 2017

మల్టీ రోబోట్

రోబోటును తయారు చేసిన ఇంజనీరింగ్ విద్యార్థులు, మల్టీ రోబోట్ డెమో ఇస్తున్న విద్యార్థిని

- తయారు చేసిన నగర ఇంజనీరింగ్ విద్యార్థులు
- ఆసుపత్రుల్లో రోగులకు సహాయపడే మరమనిషి

బెంగళూరు: బెంగళూరు నగరంలోని చాలా పెద్ద పెద్ద ఆస్పత్రుల్లో వివిధ పనుల నిర్వహణకు సిబ్బంది కొరతతో ఆయా సంస్థలు ఇబ్బందులు గురవుతుండటం సర్వసాధారణం. అయితే నేటి ఆధునిక సాంకేతిక పరిజ్ఞానం రావటంతో ఇప్పటికే మానవ ప్రమేయం లేకుండానే అనేక యంత్రాలు పనిచేస్తున్నాయి. అదే విధంగానే ఆసుపత్రి, తదితర సంస్థల్లో సిబ్బంది ప్రమేయం లేకుండా మల్టీ రోబోట్ ద్వారా పనులు చేసుకోవచ్చని బెంగళూరు నగరానికి చెందిన సప్తగిరి కాలేజ్ ఇంజనీరింగ్ విద్యార్థులు నిరూపించారు. [illegible]

[illegible] రూ.11 వేలు [illegible]

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An English translation of "Oushadhi Pooraisalu Robot"

ROBOT THAT DELIEVERS MEDICINE

Patients and their caretakers in hospitals need not be worried in the absence of caretakers. 'Robots' deliver the medicines to patients.

Students of Sapthagiri College of Engineering have devised such a robot.

Students of Sapthagiri College of Engineering, V. Nethravati, K. Nisha, M.Lavanya and M. Abhilash along with their guide Mr. N.C. Karthik have devised this robot to deliver the medicines at the right time.

Speaking at a conference Mr. Karthik mentioned that the Robots are designed such that a Centralised Robot can control 100 small robots at the same time.

At present it is helpful in hospitals, later this technique can be developed to enhance the services in other areas like academics.

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A PROJECT REPORT

On

Insect Inspired Hexapod with Audio-Video and IR Features

Submitted to

Visvesvaraya Technological University

Belagavi, Karnataka – 590018

in Partial fulfillment for the award of degree in

Bachelor of Engineering

during VIII Semester of

Electronics and Communication Engineering

*for the academic year **2017-18***

Submitted by

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MEDISETTI ANUDEEP	1SG14EC051
ARAVIND VALSALAN	1SG14EC014
DEEPAK KUMAR	1SG14EC027

Under the guidance of

Prof. Agalya P

Associate Professor

SAPTHAGIRI
College of Engineering
Creating Tommorow

2017-18

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SAPTHAGIRI COLLEGE OF ENGINEERING

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Department of Electronics and Communication Engineering

CERTIFICATE

Certified that the project work entitled "**Insect Inspired Hexapod with Audio-video and IR Features**", carried out by **Mr. Harsha Meda (1SG14EC036), Mr. Medisetti Anudeep (1SG14EC051), Mr. Aravind Valsalan (1SG14EC014), Mr. Deepak Kumar (1SG14EC027)** bonafide students of 8th Semester Electronics and Communication Engineering in partial fulfillment for the award of **Bachelor of Engineering** in Sapthagiri College of Engineering of the Visvesvaraya Technological University, Belgavi during the year 2017-18. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Signature of the Guide	Signature of the HOD	Signature of the Principal
for Sharath 4/6/18	4/6/2018	

External Viva

Name of the examiners	Signature with date
1. Sandhya Rani M.H	11/06/2018
2. Raghunath K.N	11/6/18

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ABSTRACT

The aim of the project is to build a six legged walking robot that is capable of moving on uneven terrain. Hexapod will serve as a platform onto which additional sensory components could be added, or which could be programmed to perform increasingly complex motions. we are focusing & developing mainly on efficient navigation method in different terrain using opposite gait of locomotion using hexapod, which will make it faster and at same time energy efficient to navigate and negotiate difficult terrain and also hexapod can be controlled from any part of the world at a finger tip.The project is based on studying the Features, development, and implementation of the Hexapod robot

CONTENTS

LIST OF FIGURES

CHAPTER 8

CONCLUSION AND FUTURE SCOPE

8.1 CONCLUSION

The project "**Insect Inspired Hexapod with Audio Video and IR features**" is a prototype model. The preconceived goal of making the available fully operational and providing it with the fundamental skill set to wander around predefined environments autonomously without putting itself into harm's way has been accomplished successfully along with the live video streaming.

Once the working hexapod was available to embed the programs and debugging process remotely an integrated development environment called Arduino was chosen which uses C coding as the programming language. For each experiment the programs could be easily loaded into the memory of the Arduino board.

For the faster locomotion of the hexapod a gait study was made and tripod gait movement was chosen to make the hexapod move fast on the terrain and obstacle avoidance feature was added which made the hexapod a semi-automatic robot.

As video feature is also added it made much easier to control hexapod from remote places and is very helpful if search and rescue missions. With the internet transmission of control signals hexapod could be controlled from any place around the world.

8.2 FUTURE SCOPE

Robotics is a branch in which there is always an advancement in the experiments or projects with the advancement in technology. With the help of advance technology,

1. Hexapod can be controlled using head tracking.
2. It can be used to detect humans after disaster with the help of motion detection.
3. By using Artificial Intelligence it will be possible to make the hexapod move completely on its own and get the required data without any external remote control.
4. With the help of some grippers it would be possible to make it climb vertical structures.

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Insect Inspired Hexapod with Audio-Video and IR Features

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SRISHTI
innovation exchange

State Level
Engineering Students Project
Exhibition & Competition

CERTIFICATE OF APRECIATION

This is to certify that

Mr./Ms GIRISH H

from SAPTHAGIRI ENGINEERING college

has participated in

Final Year Project / Avishkar / Paper Presentation / Idea Presentation at

SRISHTI - 2018 , State Level Project Exhibition & Competition

and secured 3rd Place

presenting his / Project / Paper / Idea titled

INSECT INSPIRED HEXAPOD WITH AUDIO VEDIO AND IR FEATURE

under ELECTRONICS AND COMMUNICATION stream

Dr. Karisiddappa	Dr. Allamaprabhu	Dr. C.P.S. Prakash
Vice-Chancellor, Visvesvaraya Technological University (VTU)	State President Akhil Bharathiya Vidyarthi Parishad Karnataka	Principal Dayananda Sagar College Of Engineering

SRISHTI
innovation exchange

State Level
Engineering Students Project
Exhibition & Competition

Organized by ABVP KARNATAKA | Host Dayananda Sagar College of Engineering

CERTIFICATE OF APRECIATION

This is to certify that

Mr./Ms HARSHA MN

from SAPTHAGIRI ENGINEERING college

has participated in

Final Year Project / Avishkar / Paper Presentation / Idea Presentation at

SRISHTI - 2018 , State Level Project Exhibition & Competition

and secured 3rd Place

presenting his / Project / Paper / Idea titled

INSECT INSPIRED HEXAPOD WITH AUDIO VEDIO AND IR FEATURE

under ELECTRONICS AND COMMUNICATION stream

Dr. Karisiddappa	Dr. Allamaprabhu	Dr. C.P.S. Prakash
Vice-Chancellor, Visvesvaraya Technological University (VTU)	State President Akhil Bharathiya Vidyarthi Parishad Karnataka	Principal Dayananda Sagar College Of Engineering

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama"

Belgavi-590014

A PROJECT REPORT ON

"SNaPs for Lake Water Treatment"

Report submitted in partial fulfillment of degree
in
Bachelor of Engineering in Biotechnology

Submitted by

ABHISHEK. B	**1SG12BT001**
M. MOHAMMAD ATHIQ	**1SG12BT013**

Guide

PRASHANTH KUMAR H P

Assistant Professor,

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Sapthagiri College of Engineering

Submitted To

SAPTHAGIRI
College of Engineering
Creating Tomorrow

For the Academic year 2015- 2016

DEPARTMENT OF BIOTECHNOLOGY

SAPTHAGIRI COLLEGE OF ENGINEERING

(Affiliated to Visvesvaraya Technological University, Belagavi, Approved by AICTE, New Delhi)

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DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE

Certified that the Project Report entitled "**SNaPs for Lake Water Treatment**" carried out by **Mr. ABHISHEK. B**, USN **1SG12BT001** & **Mr. MOHAMMAD ATHIQ**, USN **1SG12BT013** are bonafide students of Eight Semester, Sapthagiri College of Engineering in partial fulfillment for the award of Bachelor of Engineering in Biotechnology, Visvesvaraya Technological University, Belagavi during the academic year 2015-2016. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Prof. Prashanth Kumar. H. P
(Guide)

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1. Dr. Ratendra Singh
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Dr. Aswatha Kumar M
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DECLARATION

This is to certify that Project report entitled **"SNaPs for Lake Water Treatment"** which is submitted by us to Sapthagiri College of Engineering in partial fulfillment of the requirement for the award of Bachelor of Engineering in Biotechnology of the Visvesvaraya Technological University, Belagavi during the academic year 2015-2016 comprises only our original work. Due acknowledgement has been made in the text to all other material used. The work was done under the guidance of **Prof. Prashanth Kumar. H. P**, Department of Biotechnology, Sapthagiri College of Engineering. We further declare that this project report or any part of this work has not been submitted by us in any other institutes.

Name: ABHISHEK B

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ACKNOWLEDGEMENT

We would like to extend our greatest gratitude to ***GOD, Almighty*** *for his blessings that has helped us in completing this project work.*

We are thankful to our ***Prof. Prashanth Kumar H P, Guide*** *for his unfailing support which he extended regardless of the college hours & also we are grateful to his constant help and guidance.*

We take this opportunity to thank our ***Dr. Ananda S, Head of the Department*** *&* ***Prof. Shobha G, The Project Coordinator*** *for their immense support and guidance.*

We would like to extend our deepest gratitude to all of the ***Department faculty members*** *for their insightful comments and encouragement, non-teaching staff, one and all, who directly or indirectly, have let their hand in this venture & helping us to fulfill our cherished desire of becoming Biotechnology Engineers.*

We express our sincere thanks to our ***Dr. Aswatha Kumar M, Principal,*** *and* ***Dr. N. Srinivasan, Director. Sri Dayanand G, Chairman,*** *&* ***Sri Manoj G.D, Executive Director,*** *Sapthagiri College of Engineering, Bangalore for providing us with excellent facilities in the college which gave us opportunity to have a sound base of Engineering knowledge.*

Our sincere thanks to all our ***Friends & Classmates*** *who have supported and encouraged us during the project.*

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ABSTRACT:

Water has become one of the major resources which is under constant demand for many decades. Lakes will be one of the major water resources in the coming decades. This work is based on the treatment of one of the highly polluted lakes of Bangalore which is Bellandur Lake. The project aims to purify Lake water using low cost adsorbents which are majorly prepared using wastes (fruit peel wastes) thus the name SNaPs (Sophisticated Natural peels filter). Based on the recent literature surveys it was found that Pineapple & Sweet Lime peels can be used as an efficient adsorbent through certain pre-processing techniques. The main aim of this project is to design & fabricate a sophisticated water purifier so as to purify the Bellandur Lake water which is highly contaminated with fluoride ions & other contaminants. The SNaPs filter was designed based on the various optimization factors which was obtained through different adsorbent & adsorption studies of Activated Carbons (AC). The Adsorption Isotherm models it was confirmed that Pineapple showed both mono & multi-layer adsorption process. This result helped in choosing Pineapple (PA) as an appropriate adsorbent with high level of efficiency. A complete working prototype had been designed in which the adsorbent with high efficiency was used.

Keywords: *Bellandur Lake water; fruit peel wastes; Adsorption; Activated Carbon; prototype; SNaPs & Isotherm models.*

Rain raises toxic foam levels at Bellandur lake

Bellandur lake fire: Red ... action on officials

POINT BLANK

Buffer zone

NGT order, a ray of hope for lakes

Govt orders expert panel to oversee Bellandur lake survey

Varthur lake faces strangulation

Deccan Herald Newspaper

SNAPS

SNaPs for Lake Water Treatment

Rain raises toxic foam levels at Bellandur lake

People struggle to bear stench from polluted water body

Bellandur lake fire: Red tape delays action on officials

DECCAN HERALD

NGT verdict, lifesaver for lakes

BUTTERFLY

POINT BLANK

NGT order, a ray of hope for lakes

Govt orders expert panel to oversee Bellandur lake survey

Varthur lake faces strangulation

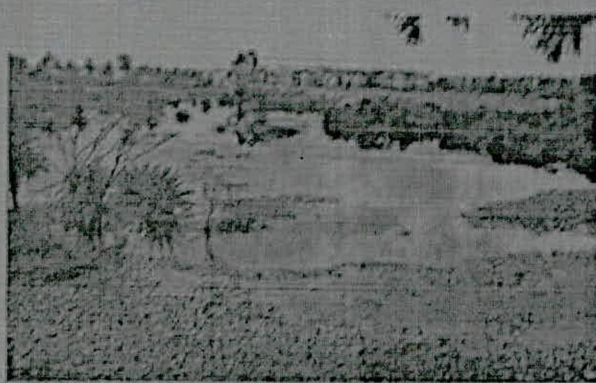
Massive encroachment of valley zone, feeder canal under way, topography altered

Deccan Herald Newspaper

Industrial waste contamination plagues groundwater in Peenya

Of the samples tested, 40% were acidic while almost all were above permissible limits for hardness

[illegible]



[illegible] lake is so polluted with chemical effluents and sewage that the water has been deemed unfit for even industrial use.

Worrying numbers

Criteria	Permissible limits	Peenya samples
Total hardness	[illegible]	[illegible]
Total dissolved Solids	500 mg/l	2,000 mg/l
Temperature	[illegible] Celsius	[illegible] Celsius
Conductivity	[illegible]	[illegible]
Biological Oxygen Demand	1-2 mg of oxygen per litre	[illegible] mg of oxygen per litre
Metals and their levels (in mg/l)		
SO4	[illegible]	256
Manganese	[illegible]	[illegible]
Iron	1	[illegible]
Chloride	250	[illegible]
Sodium	[illegible]	408
Lead	-	[illegible]

[illegible] with chemical effluents and sewage that the water has been deemed unfit for even industrial use. Now, there are signs that this contamination may have seeped into the groundwater, which is drawn from 800-feet-deep borewells.

Jayaram Shetty, who lives close to Peenya Phase II, says 90% of the residents have stopped using borewell water for drinking purposes.

The anecdotal evidence points to a larger problem, which two professors from the Department of Biotechnology at Sapthagiri College of Engineering sought to quantify. They took samples from borewells and open wells at Peenya Phase III and Phase IV where metal and textile units are found aplenty.

Of the samples tested, 40% were found to be acidic while almost all samples were above the permissible limits for hardness. [illegible]

[illegible] authored the study.

The study was one part in a series that looks at how microbes react to lead in groundwater. "We found two species of bacteria that had absorbed the lead. Perhaps, a network of this bacteria can at least reduce the lead content," she says.

Mahyadri Reddy M., president, Peenya Industrial Area Association, says that the construction of a Common Effluent Treatment Plant (CEPT) would effectively ensure no effluent is let out untreated. The [illegible] crore project has yet to start. "Industries can directly take the effluents to the CEPT and ensure rivers, lakes or groundwater are not polluted. Currently, they give the water to private tankers at ₹7 per litre," he said.

ree park... not commercial complex'

Indiranagar. "Nearly 90% of the establishments here don't have either Occupancy Certificate or trade licences." [illegible] the iChange Indiranagar representatives next week to discuss alternatives to the proposed [illegible]

Police open fire at rowdy

The [illegible] police opened fire on a 22-year-old rowdy who allegedly attacked them in a bid to escape. The accused, Syed Suhail, [illegible]

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INDIAN EXPRESS: 28th Feb-2015

Innovative Ideas Galore as Engineering Expo Wraps Up

NOTE:
UNDER THE GUIDANCE OF
Prof. Vinutha Moses
Dr. Soumya. C.
Mr. Shobha. G

Express News Service

Bengaluru: Innovative exhibits on water purification and energy conservation were on display during Anveshan 2015, a three-day science and engineering fair in the city, which concluded on Friday.

The event showcased about 50 exhibits, each jointly developed by a team of undergraduate engineering students along with two students drawn from government high schools.

A low-cost filtration process to remove fluoride from ground water in villages was exhibited by the students of Sapthagiri College of Engineering. Elaborating on the process, project team leader Rajeev Roshan, a third year student, said their device costs just ₹750, against conventional filters which cost between ₹4,000 and ₹12,000. "Tricalcium phosphate is used to remove flouride content in this filtration process," he said.

It was a team effort by Roshan's classmate V Aishwarya, and Suryaprakash P and Venu N, Class 9 students of the Government High School at Bagalkunta.

A solar tree-cum-wind mill for 24-hour electricity generation, designed by the mechanical engineering students of R L Jalappa Institute of Technology, Kodigehalli, too was displayed. It was a tree-shaped structure with a small windmill on top with metal and steel rods for branches. About 150 small solar cells connected to a battery were placed on top.

The event was organised by Agastya International Foundation.

25.3.15

25/3/15

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI - 590 018, KARNATAKA

PROJECT REPORT

ON

"FABRICATION OF TORQUE CONVERTER"

Submitted in partial fulfillment of the requirement for the award of

BACHELOR OF ENGINEERING
In
MECHANICAL ENGINEERING

Submitted by:

PRASHANTH M	**(1SG13ME085)**
RISHABH SOMAIAH K	**(1SG13ME094)**
SANJAY KUMAR R	**(1SG13ME101)**
VISHWAS D R	**(1SG13ME125)**

Under the guidance of
Dr. MANJUNATH S H
Professor and Head

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2016-17

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DEPARTMENT OF MECHANICAL ENGINEERING

SAPTHAGIRI
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CERTIFICATE

This is to certify that the project entitled **"FABRICATION OF TORQUE CONVERTER"** has been satisfactorily completed by **PRASHANTH M (1SG13ME085), RISHABH SOMAIAH (1SG13ME094), SANJAY KUMAR R (1SG13ME101)** and **VISHWAS D R (1SG13ME125)**, students of 8th semester. Mechanical Engineering in partial fulfillment of requirements for the award of Bachelor's Degree in Mechanical Engineering by Visvesvaraya Technological University, Belagavi during academic year 2016-17.

26/6/17

Signature of the Guide
Dr. MANJUNATH S H
Professor and Head
Department of Mechanical Engineering

Dr. ASWATHA KUMAR M
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2. Dr. L. ARULMANI	27/6/17.

60

ABSTRACT

This project describes the development of power transmission through Torque converter. This design simplifies the transmission of power from rotary motion and also over comes the complexity of changing the speed ratios of pulleys and gears. The main purpose of this design is to attain 'n' number of speed ratios between designed limit. This contrasts with other mechanical transmissions that offer a fixed number of gear ratios. The flexibility of a Torque converter allows the input shaft to maintain a constant angular velocity.

Torque converters are not new to the automotive world, but their torque capabilities and reliability have been limited in the past. New developments in gear reduction and manufacturing have led to ever-more-robust Torque converters, which in turn allows them to be used in more diverse automotive applications. Torque converters are also being developed in conjunction with hybrid electric vehicles. As Torque converter development continues, costs will be reduced further and performance will continue to increase, which in turn makes further development and application of Torque converter technology desirable.

11.1 VIBROMETER

A **Laser Doppler Vibrometer (LDV)** is a scientific instrument that is used to make non-contact vibration measurements of a surface. The laser beam from the LDV is directed at the surface of interest, and the vibration amplitude and frequency are extracted from the Doppler shift of the reflected laser beam frequency due to the motion of the surface. The output of an LDV is generally a continuous analog voltage that is directly proportional to the target velocity component along the direction of the laser beam.

Some advantages of an LDV over similar measurement devices such as an accelerometer are that the LDV can be directed at targets that are difficult to access, or that may be too small or too hot to attach a physical transducer. Also, the LDV makes the vibration measurement without mass-loading the target.

Fig 11.1 Conventional Vibrometer [14]

Above depicted such vibrometers can be used to measure the vibrations of the vehicle and required damping if necessary can be implemented. However due to the high cost of the

available compact vibrometers, it could not be implemented as of now but future advancements can be incorporated to get better performance of the vehicle.

11.2 TORQUE SENSOR

A **torque sensor** is a device for measuring and recording the torque on an engine, crankshaft, gearbox, transmission, rotor, a bicycle crank or cap torque tester. Static torque is relatively easy to measure. Dynamic torque, on the other hand, is not easy to measure, since it generally requires transfer of some effect (electric, hydraulic or magnetic) from the shaft being measured to a static system.

One way to achieve this is to condition the shaft or a member attached to the shaft with a series of permanent magnetic domains. The magnetic characteristics of these domains will vary according to the applied torque, and thus can be measured using non-contact sensors. Such magneto elastic torque sensors are generally used for in-vehicle applications on race cars, automobiles, aircraft, and hovercraft.

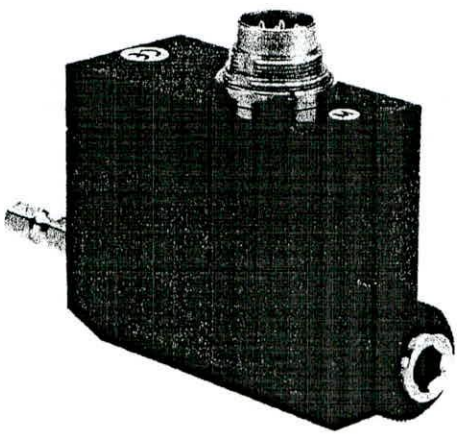

Fig 11.2 Torque Sensor [14]

12 ಅಡಿ ಉದ್ದವಿದೆ ವಿದ್ಯಾರ್ಥಿಗಳೇ ರೂಪಿಸಿದ ಬೈಕ್

Team Torque Racing

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VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANA SANGAMA, BELGAUM-590018

A Project Report
On
"Modification of Bajaj Chetak into Electric Scooter "

Submitted in partial fulfillment of the requirements for the award of degree in
Bachelor of Engineering in Mechanical
Visvesvaraya Technological University, Belgaum

Submitted by,

BHARATH KUMAR B (1SG15ME403)
HEMANTH KUMAR B (1SG15ME411)
LOKANATH V (1SG15ME413)
MANJUNATH P (1SG15ME414)

Under the Guidance of

A.M. MAHESHA MTech
Associate Professor
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Certified that the Project topic **Modification of Bajaj Chetak into electric scooter** has been successfully presented at **Sapthagiri College of Engineering** by **Bharath Kumar B (1SG15ME403), Hemanth Kumar B(1SG15ME411), Lokanath V (1SG15ME413), Manjunath P (1SG15ME414),** in partial fulfillment of the requirements for the *VIII* Semester degree of **Bachelor of Engineering in Mechanical Engineering** of Visvesvaraya Technological University, Belgaum during academic year 2017-2018. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work for the said degree.

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Associate Professor

12/6/18

Signature of the HOD
DR. P. MAHADEVA SWAMY
Prof and HOD Mechanical Dept

Signature of the principal
Dr. K.L SHIVABASAPPA
Principal

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ABSTRACT

E-SCOOTER:

The global warming has become a very important issue during the last decade. The worldwide research is oriented to obtain efficiency improvements on energy consuming and sustainable energy sources utilization. Electric vehicles (EV'S) are able to achieve this goal. In addition the utilization of high efficiency electric machines, using high energy permanent magnet, allows an increased reduction of fuel consumption and exhaust gas emissions.

Purchasing of old Bajaj chetak scooter and dismantled all the parts which are not required and make it ready for incorporating the devices and components to convert into electrical vehicle. Mounting of electric motor to the rear wheel, placing of controller unit and battery at appropriate places in the Bajaj electric scooter, testing of electrical vehicle and its performance to estimate the range of the vehicle using the data obtained during the test.

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CONTENT

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CHAPTER-1

INTRODUCTION

All vehicles that are existing in the market cause pollution and the fuel cost is also increasing day by day. In order to compensate the fluctuating fuel cost and reducing the pollution a good remedy is needed i.e. our transporting system. Due to ignition of the hydrocarbon fuels, in the vehicle, sometime difficulties such as wear and tear may be high and more attention is needed for proper maintenance. Our vehicle is easy to handle and fuel cost is very low compared to the other existing vehicles.

Hence a need for a change in the existing alternative system which can produce higher efficiency at minimum cost was though about an attempt has been made to design and fabricate such an alternative system. So this project "ELECTRIC TWO WHEELER WITH RECHARGEABLE BATTERY" is very much useful, since it is provided with good quality of power sources and simple operating mechanism with different ranges & speeds.

Throughout the 'UNIVERSE' there lies an abundant natural resource of various petroleum products. But to everyone's knowledge, it is a well-known fact that these resources may not last long for quite sufficient period to face out hereditary needs. Hence "EACH AND EVERY DROP OF FUEL SAVES OUR ECONOMY AND MEET THE NEEDS" is the saturation point that is to be attained as soon as possible. In order to achieve this saturation, point we have to save and seek for some other source of power. This power, the alternate power must be much more convenient in availability and usage.

The next important reason for the search of effective, unadulterated power are to save the surrounding environments including men, machine and material of both the existing and the next fourth generation from pollution, the cause for many harmful happenings and to reach the saturation point. The most talented power against the natural resource is supposed to be the electric and solar energies that best suit the automobiles. The unadulterated zero emission electrical and solar power, is the only easily attainable alternate source.

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CHAPTER 16

CONCLUSION

To develop a new system with all-eminent features and better improvements is little, but difficult task. Where the conservation of fuel fails pollution starts and hence conservation as an imperative is necessary. For a greener future, the fuel should be saved at least from today onwards and hence the need arises for an alternate system that efficiently replaces the present fuel system.

With the increasing consumption of natural resources of petrol, diesel it is necessary to shift our way towards alternate resources like the Electric scooter and others because it is necessary to identify new way of transport.

Electric scooter is a modification of the existing cycle by using electric energy and also solar energy if solar panels are provided, that would sum up to increase in energy production. Since it is energy efficient, electric scooter is cheaper and affordable to anyone. It can be used for shorter distances by people of any age. It can be contrived throughout the year.

The most vital feature of the electric scooter is

- It does not consume fossil fuels thereby saving crores of foreign currencies.
- The second most important feature is it is pollution free, eco–friendly and noiseless in operation. For offsetting environmental pollution using off onboard Electric Bike is the most viable solution.

It can be charged with the help of AC adapter if there is an emergency. The Operating cost per/ km is very less and with the help of solar panel it can lessen up more. Since it has fewer components it can be easily dismantled to small components, thus requiring less maintenance.

Engg students turn old scooter into e-vehicle

TIMES NEWS NETWORK

Bengaluru: Ever come across vintage two-stroke Yamaha RX100 and RX135 bikes or Bajaj Chetak scooters running on battery? Well, final-year mechanical engineering students of Sapthagiri College of Engineering have created an e-scooter out of an old Bajaj Chetak rusting in the corner of a garage in Shivajinagar.

The undergraduate students bought the scooter for Rs 500 after bargaining with a scrap dealer and then dismantled it. They replaced the engine with battery discharge and DC motor.

"The DC controller helped in controlling the headlights, indicator and the horn," said Hemant Kumar, one of the students.

The team worked on the project day and night for two months to reconstruct the bike. "It is a proud moment for the college as these students achieved the feat at a budget of Rs 12,000," said KL Shivabasappa, principal, Sapthagiri College of Engineering.

INNOVATION OUT OF SCRAP

Worried by the spiralling prices of motor fuel, the students wanted to come up with a vehicle that will reduce fuel consumption. "The e-scooter needs to be charged 3-4 hours and consumes 3.5 units of electricity before it can hit the road. The vehicle is equipped with a socket on its left and can be easily charged with an AC adapter," said Prashant, professor of bio-technology, Sapthagiri College of Engineering.

The college is thinking of approaching Bajaj to see if their prototype could be produced commercially.

Cheap plough machine to help farmers

Students of Sapthagiri College of Engineering have also created a ploughing machine that can be operated manually. The machine has a 25 litre storage drum to keep seeds and fertilisers.

As the plough rotates, seeds and fertilisers fall to the ground. It could be a cheaper option for farmers compared to other ploughing machines in the market, said M Manikanta, a student.

Modification of Bajaj Chetak into Electric Scooter

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INCLUDES 32 PAGES OF BANGALORE TIMES

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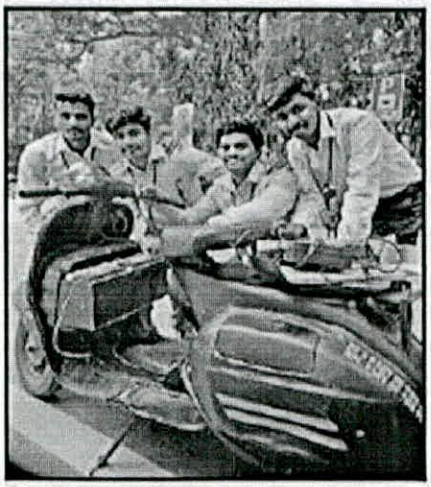

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VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANA SANGAMA, BELAGAVI-590018

A PROJECT REPORT

ON

"FABRICATION OF MULTIPURPOSE AGRICULTURAL EQUIPMENT"

Submitted By

Mr. SANTHOSHA (1SG15ME083)

Mr. MOUNESH (1SG16ME421)

Under the Guidance of

Dr. TULSIDAS D.

Associate Professor

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Certified that the project work entitled "**FABRICATION OF MULTIPURPOSE AGRICULTURAL EQUIPMENT.**" carried out by **SANTHOSHA (1SG15ME083), MOUNESH (1SG16ME421),** bonafide students of 8th semester, Department of **Mechanical Engineering** at **Sapthagiri College of Engineering,** Bangalore in partial fulfilment of the award of **Bachelor of Engineering** in **Mechanical Engineering** of the **Visvesvaraya Technological University,** Belagavi during the year 2018-19. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Dr. Tulsidas D	Dr. P Mahadevaswamy	Dr. K L Shivabasappa
Signature of the Guide	**Signature of the HOD**	**Signature of the Principal**

Reviewer

Name of the Examiner	**Signature with date**
1. Dr. Mahadevaswamy P	11/6/19
2. Dr. Kiran T S	11/6/19

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ABSTRACT

Considering the fact that the majority of farmers are having small land. It also reduces human effort. Our project work is mainly based on engine and chain sprocket mechanism. It is a saver of time and expenses on the field operations. Development of high capacity *energy efficient and combination machinery for increased labour productivity; reduced unit cost of operation, the multipurpose agricultural equipment known of mini tiller is one* of the many farm machines. In promoting the mini tiller especially improved timeliness of operation.

The mini-tiller is a mechanized plough used to prepare land for agricultural production. It can plough land more efficiently than plough that rely on animal draft power, and at the same time reduce drudgery. The mini-tiller is similar in purpose to the power-tiller, but is more compact, making it easier to operate on narrow plots of terraced land.

This mini tiller can be utilized by middle class farmers and who are suffered from deep problems because of unavailability of enough labour to work in farmland. Thus this multipurpose agricultural equipment can be beneficial for the small scale farmers.

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CHAPTER 1

INTRODUCTION

Agriculture is the main occupation in majority of developing countries such as India, Brazil etc. One major reason for lack of yield per unit agricultural area in these countries are weeds. Majority of the population in developing countries depends on agriculture and agro based industries. Farming is the main and growing business of our country. Presently we are using conventional instruments for it, which is of low efficiency and resulting in low yielding from forms.

This multipurpose agricultural equipment is one of the many farm mechanization. Unlike tractors, this equipment is non-conventional so far as the displacement of labours is concerned. The multipurpose agricultural equipment especially considering the fact that the majority of farmers are having small land and they cannot go for the costlier tractors. So this should become a useful machine for the smaller field farmers. It is also useful machine in the internal cleaning of crops which having small distance between them like groundnuts, sugarcane, soya bin crops, cultivation of paddy for the smaller farmers. Its main objective is to reduce the manpower and working time.

1.2 Main Features of Indian Agriculture

(i) Source of livelihood:

Agriculture is the main occupation. It provides employment to nearly 61% persons of total population. It contributes 25% to national income.

(ii) Dependence on monsoon:

Agriculture in India mainly depends on monsoon. If monsoon is good, the production will be more and if monsoon is less than average then the crops fail. As irrigation facilities are quite inadequate, the agriculture depends on monsoon.

(iii) Labor intensive cultivation:

Due to increase in population the pressure on land holding increased. Land holdings get fragmented and subdivided and become uneconomical. Machinery and equipment cannot be used on such farms.

CHAPTER 8

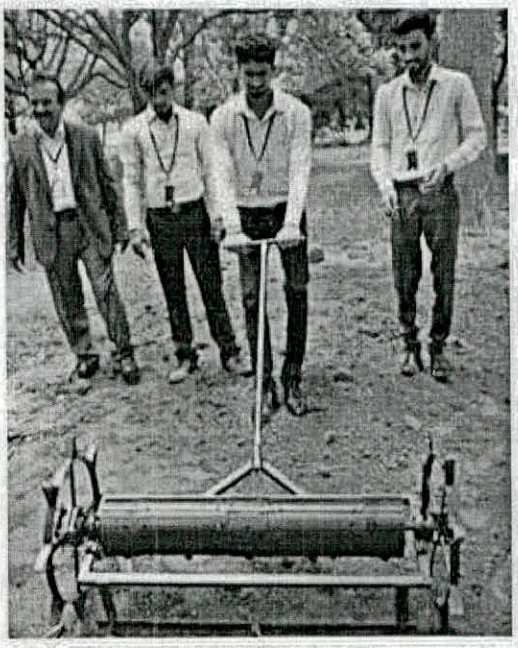
CONCLUSION

The multipurpose agricultural equipment is successfully fabricated and tested which reduces the working time and man power. It is very useful for small land farmers. It fulfills the all requirements of farmers such as ploughing, seed sowing and tool sharpening by using grinding wheel with the minimum cost.

Practically multipurpose agricultural equipment can be used for seed sowing, ploughing and also for grinding. All the parts are connected in such a way that in every stage of agriculture the equipment can be rearranged or easily assembled.

Our team has successfully combined many ideas from various fields of mechanical engineering and agricultural knowledge to improve the yield and by reducing the labour effort and expenses. The whole idea of multipurpose equipment is a new concept and can be successfully implement in real life situations.

ವಿದ್ಯಾರ್ಥಿಗಳಿಂದ ವಿದ್ಯುತ್ ಚಾಲಿತ ದ್ವಿಚಕ್ರ ವಾಹನ, ಬಿತ್ತನೆ ಉಪಕರಣ ಆವಿಷ್ಕಾರ



ಬೆಂಗಳೂರು, ಜು.10: ನಗರದ ಸಪ್ತಗಿರಿ ಇಂಜಿನಿಯರಿಂಗ್ ಕಾಲೇಜಿನ ಅಂತಿಮ ವರ್ಷದ ವಿದ್ಯಾರ್ಥಿಗಳು ಜನಸಾಮಾನ್ಯರಿಗೆ ಅನುಕೂಲವಾಗುವ ವಿದ್ಯುತ್ ಚಾಲಿತ ದ್ವಿಚಕ್ರ ವಾಹನ ಮತ್ತು ರೈತರ ಉಳುಮೆ ಹಾಗೂ ಬೀಜಬಿತ್ತನೆ ಉಪಕರಣವನ್ನು ಆವಿಷ್ಕಾರ ಮಾಡಿದ್ದಾರೆ.

ನಗರದ ಪ್ರೆಸ್‌ಕ್ಲಬ್‌ನಲ್ಲಿ ಆಯೋಜಿಸಿದ್ದ ಸುದ್ದಿಗೋಷ್ಠಿಯಲ್ಲಿ ಮಾತನಾಡಿದ ಕಾಲೇಜು ಪ್ರಾಂಶುಪಾಲ ಕೆ.ಎಲ್.ಶಿವಬಸಪ್ಪ, ವಿದ್ಯಾರ್ಥಿಗಳು ಬಜಾಜ್ ಚೇತಕ್ ಸ್ಕೂಟರನ್ನು ಇ-ಸ್ಕೂಟರ್ ಆಗಿ ಪರಿವರ್ತಿಸಿದ್ದಾರೆ. ಅದಕ್ಕಾಗಿ ವಿದ್ಯುತ್ ಬ್ಯಾಟರಿ ತಯಾರಿಸಿದ್ದು, ಅದರಿಂದ ವಾಹನ ಚಲಿಸುತ್ತದೆ. ಇದರಿಂದ ಯಾವುದೇ ರೀತಿಯ ಮಾಲಿನ್ಯ ಉಂಟಾಗುವುದಿಲ್ಲ. ಇದರ ತಯಾರಿ ವೆಚ್ಚ ಸುಮಾರು 12 ಸಾವಿರ ರೂ. ಆಗಿದ್ದು, ಸಾರ್ವಜನಿಕರಿಗೆ ಕಡಿಮೆ ಬೆಲೆಯಲ್ಲಿ ಸಿಗಲಿದೆ ಎಂದು ತಿಳಿಸಿದರು.

ಸಣ್ಣ ಇಡುವಳಿದಾರ ರೈತರಿಗೆ ನೆರವಾಗುವ ಉಪಕರಣ ಆವಿಷ್ಕರಿಸಿದ್ದು, ರೈತರ ಸಮಯ ಹಾಗೂ ತೊಂದರೆ ನಿವಾರಿಸಲಿದೆ. ಡ್ರಮ್ ಬಳಸಿ ಇದನ್ನು ತಯಾರು ಮಾಡಿದ್ದು, ಬೀಜಗಳನ್ನು ಡ್ರಮ್‌ನಲ್ಲಿ ತುಂಬಿಸಿ ಬಿತ್ತನೆ ಮಾಡಬಹುದು. ವೆಚ್ಚ 600 ರಿಂದ 800 ರೂ. ತಗಲಿದೆ ಎಂದರು.

ಸುದ್ದಿಗೋಷ್ಠಿಯಲ್ಲಿ ಕಾಲೇಜಿನ ಕಾರ್ಯನಿರ್ವಾಹಕ ನಿರ್ದೇಶಕ ಮನೋಜ್, ಮೆಕಾನಿಕಲ್ ವಿಭಾಗದ ಹೆಚ್‌ಓಡಿ ಡಾ.ಮಹಾದೇವ ಸ್ವಾಮಿ, ವಿದ್ಯಾರ್ಥಿಗಳಾದ ಬಿ.ಭರತ್‌ಕುಮಾರ್, ಬಿ.ಹೇಮಂತ್ ಕುಮಾರ್, ಲೋಕನಾಥ್ ಉಪಸ್ಥಿತರಿದ್ದರು.

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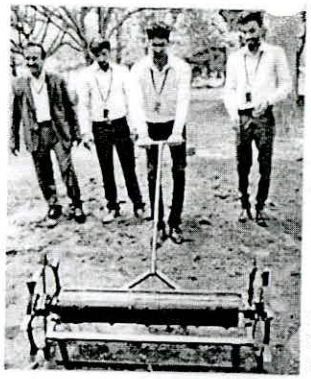
ವಾಹನ, ಬಿತ್ತನೆ ಉಪಕರಣ ಆವಿಷ್ಕಾರ



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Multi Purpose agricultural equipment

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Translation of "Vidhyathigalingda Vidyut Chalitha Dwichakra Vaahana, Bithane Upakarana Aavishkara"

DESIGN OF INSTRUMENT FOR SOWING OF SEEDS BASED ON ELECTRICITY DRIVEN 2 WHEELER VEHICLE

Bangalore July 10: Final year students of Sapthagiri College of Engineering have designed an instrument to help the common man and farmers to till the land and sow seeds.

Speaking at a press conference, K.L. Shivabasappa, Principal, Sapthagiri College of Engineering mentioned that the students have modified a Bajaj Chetak into e-Scooter. This reduces the pollution and cost is around Rupees 12,000.

This is helpful to small farmers as it saves time and effort. They have used a drum to store the seeds meant for sowing. The cost of which varies around rupees 600 to 800.

Executive Director Mr. Manoj, Head of Department of Mechanical Engineering Dr.Mahadevaswamy, Students of Sapthagiri College of Engineering B. Bharat Kumar, B. Hemanth Kumar and Lokanath were present at the gathering.

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VISVESVARAYA TECHNOLOGICAL UNIVERSITY
JNANASANGAMA, BELGAUM-590018

PROJECT REPORT
ON
"BLINDMAN SMART STICK"

Submitted in the partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING
IN
ELECTRICAL AND ELECTRONICS

Submitted by

PALLAVI. S	1SG14EE053
PAVAN KUMAR. H. D	1SG14EE055
POORVA. H	1SG14EE058
SHILPA. H S	1SG14EE070

Under the supervision of

Mrs. RAMYA.M
Asst. Prof. of EEE

Ms. SHWETHA.C
Asst. Prof. of EEE

SAPTHAGIRI
College of Engineering
Creating Tomorrow

For the academic year of
2017-18

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SAPTHAGIRI COLLEGE OF ENGINEERING
No. 14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057

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Department of
ELECTRICAL AND ELECTRONICS ENGINEERING

CERTIFICATE

Certified that the project work entitled **"BLINDMAN SMART STICK"** carried out by **PALLAVI. S** bearing **USN [1SG14EE053], PAVAN KUMAR H. D** bearing USN **[1SG14EE055], POORVA. H** bearing **USN [1SG14EE058], SHILPA.H S** bearing USN **[1SG14EE070],** bona fide students of **Sapthagiri College Of Engineering** in partial fulfillment for the award of **Bachelor of Engineering** in department of **Electrical and Electronics Engineering** of Visvesvaraya Technological University, Belagavi during the academic year 2017-2018. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering Degree.

Signature of the Guide
Mrs. Ramya. M
Asst. Professor
(Project Guide, Dept. Of EEE)

Signature of the Guide
Ms. Shwetha. C
Asst. Professor
(Project Guide, Dept. Of EEE)

Signature of the HOD
Dr. K.N. Ravi
Professor& H.O.D
(Head of the Dept., EEE)

28/5/18
Signature of the Principal
Dr. Shivabasappa. K. L
Principal
S.C.E Bangalore

External Viva

Name of the examiners	Signature with date
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ABSTRACT

Blindman Smart Stick is an innovative stick designed for visually disabled people for improved navigation. We here propose an advanced blind stick that allows visually challenged people to navigate with ease using advance technology. The blind stick is integrated with ultrasonic sensor along with buzzers and Vibration motor.

Our proposed project first use ultrasonic sensors to detect obstacles ahead using ultrasonic waves. On sensing obstacles the sensor passes this data to the Arduino. The Arduino then processes this data and calculates if the obstacle is close enough. If the obstacle is not that close the circuit does nothing. If the obstacle is close the microcontroller sends a signal to rotate the vibration motor which produces vibration and the person and feel the same. Water sensor is used to detect the presence of water and provide an alert in time for path change so as to avoid slipping. The system has one more advanced feature integrated to help the blind find their stick if they forget where they kept it. A wireless RF based remote is used for this purpose. Pressing the remote button sounds a buzzer on the stick which helps the blind person to find their stick. Thus this system allows for obstacle detection as well as finding stick if misplaced by visually disabled individuals.

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1.1 INTRODUCTION:

Vision is the most important part of human physiology as 83% of information human being gets from the environment is via sight. The 2017 statistics by the World Health Organization (WHO) estimates that there are 36 million people whowere blind. Further, 217 million people live with severe or moderate visual impairment (MSVI). In total, 253 million people were living with visual impairment in 2015. It also estimates that 1.1 billion people have near-vision impairment- a condition that can be corrected with spectacles.

The traditional and oldest mobility aids for persons with visual impairments are the walking cane (also called white cane or stick) and guide dogs. The most important drawbacks of these aids are necessary skills and training phase, range of motion and very little information conveyed. With the rapid advances of modern technology, both in hardware and software front have brought potential to provide intelligent navigation capabilities.

Recently there has been a lot of Electronic Travel Aids (ETA) designed and devised as solution to help the blind navigate independently and safely. These solutions have improved the mobility and live of the visually impaired persons but only upto a little extent. The device was hence not considered successful widely. To alleviate these issues the Blindman Smart Stick is designed in such a way that it includes an Ultrasonic sensor for Obstacle detection, supported with water detection. In this system, Buzzers and Vibratory motors are used to inform about the moving obstacles. The intensity of buzzer sound and vibration depends on proximity obstacles and also helps in finding the misplaced stick with the aid of RF wireless module.

The system will allow the blind to freely navigate to their desired destination and solves the problem while moving in the road due to constantly in fear of collision and injury. It is also user friendly and easy.

It is affordable and therefore can be mass produced for use of the visually impaired. The system have the capacity to detect obstacles that exist on the ground during walks indoor and outdoor navigation by allowing the blind person to move independently, safely and quickly through the obstacles and danger zones areas . This system doesn't require a huge device to hold for a long, tenure and distance and it also doesn't require any special training for its utilization by the subject. This project offers a numerous applications in the medical field to provide a better responsive mate to the visually impaired. It's practical, cost efficient and extremely useful. It can be further improved to have more decision taking capabilities by employing varied types of sensors and thus could be used for different applications. Thus, our objective of eliminating the dependency of blind person is successfully achieved.

5.3 FUTURE ENHANCEMENT:

A variety of future scopes are available that can be used like If a visually impaired person wants to go to a city location, they can walk along a road or corridor using an ETA system in the local area. However, it is difficult to know one's position globally. Hence, a global positioning method will be the subject of further research. The global position of the user is obtained using the global positioning system (GPS), and their current position and guidance to their destination can be given to the user by voice. A wall-following function can also be added so that the blind can walk straight along a corridor in an indoor environment. Future work can be focused on enhancing the performance of the system and reducing the load on the user by adding the camera to guide the blind exactly. Images acquired by the web camera and NI-smart cameras helps in identification of objects as well as scans the entire instances for the presence of number of objects in the path of the blind person. Other enhancements can be like

- Implementation to detect the range of the obstacle.
- Implementation to differentiate the obstacle as Stationary or Moving.
- Including a weather sensing devices to sense different environmental conditions.

5.1 RESULTS:

The Blind Walking Stick has been finally made into a prototype which can be used to guide the blind. It majorly uses an ultra-sonic sensor to detect the front obstacles both above and below knee level, water sensors that sense any kind water allowing the safe walk of the blind people. It has buzzers incorporated into itself that gives different sounds from different sensors and vibrational motor doing as same as buzzer making navigation very easy and RF remote to find the stick if misplaced.

The system is designed, implemented, tested, and verified. The real-time results of the system are encouraging. The results indicate that the system is efficient and unique in its capability in specifying the source and distance of the objects that may encounter the blind. It is able to scan areas above and below knee level of the blind person regardless of its height or depth. The ultrasonic sensor has been fully utilized in order to advance the mobility of the blind and visual impaired people in safe and independent way. Therefore, it was favoured by those who participated in the test.

The results obtained by trial from a group of volunteers who walked an obstructed path blindfolded were promising and furthermore trials will be conducted. The results were promising to an extent that ensures the safety and speed of the mobility of the deprived user. The model being cost effective is thus expected to be used by majority of the visually deprived section of the society. Thus system resolves limitations that are related to the most of the movement problems that may influence the blind people in their environment.

5.2 CONCLUSION:

Smart Sensors are not just a fad, they are the wave of the future. As more people realize the value of these inventions the field will grow without bounds. This can be demonstrated by the design specified. A simple, cheap, configurable, easy to handle electronic guidance system is proposed to provide constructive assistant and support for blind and visually impaired persons.

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ಸಂಜೆವಾಣಿ

ಬೆಂಗಳೂರು ಜಾಹೀರಾತಿಗಾಗಿ ಸಂಪರ್ಕಿಸಿ

ಅಂಧರಿಗೆ ವಾಕಿಂಗ್ ಸ್ಟಿಕ್

(ನಮ್ಮ ಪ್ರತಿನಿಧಿಯಿಂದ)

ಬೆಂಗಳೂರು, ಜು. 2- ಪ್ರಕೃತಿ ವಿಕೋಪ, ಯುದ್ಧಭೂಮಿ, ತುರ್ತು ಸಂದರ್ಭಗಳು, ಗಡಿ ಅವಘಡಗಳ ರಕ್ಷಣಾ ಕಾರ್ಯಾಚರಣೆಗಾಗಿ ನೂತನ ರೋಬೋಟ್ ಮತ್ತು ಅಂಧರಿಗೆ ಸುಲಭವಾಗಿ ನಡೆದಾಡಲು ಅನುಕೂಲವಾಗುವಂತಹ ನೂತನ ವಾಕಿಂಗ್ ಸ್ಟಿಕ್‌ನ್ನು ಸಪ್ತಗಿರಿ ಇಂಜಿನಿಯರಿಂಗ್ ಕಾಲೇಜಿನ ವಿದ್ಯಾರ್ಥಿಗಳು ಆವಿಷ್ಕಾರಗೊಳಿಸಿದ್ದಾರೆ.

ಸಪ್ತಗಿರಿ ವಿದ್ಯಾರ್ಥಿಗಳ ಆವಿಷ್ಕಾರ

ಈ ರೋಬೋಟ್‌ಗೆ 16 ಸರ್ವರ್‌ಗಳನ್ನು ಅಳವಡಿಸಲಾಗಿದ್ದು ಯಾವ ಪ್ರದೇಶದಲ್ಲಾಗಲಿ, ಯಾವದಿಕ್ಕಿನಲ್ಲಾಗಲಿ ನಿರರ್ಗಳವಾಗಿ ಚಲಿಸಬಲ್ಲದು. ಯಾವುದೇ ವಸ್ತು ಅಡ್ಡಲಾಗಿ ಬಂದರೆ ತನ್ನ ದಿಕ್ಕು ಬದಲಿಸಿ ಸಂಚರಿಸಲಿದೆ. ಅಂತರ್ಜಾಲ ಸಂಪರ್ಕದ ಮೂಲಕ ಪ್ರಪಂಚದ ಯಾವದೇ ಮೂಲೆಯಲ್ಲಿ ಕುಳಿತು ರೋಬೋಟ್‌ನ್ನು ನಿಯಂತ್ರಿಸಬಹುದು. ರಕ್ಷಣಾ ಕಾರ್ಯಾಚರಣೆ, ಯುದ್ಧಭೂಮಿ, ತುರ್ತು ಸಂದರ್ಭಗಳಲ್ಲಿ ಈ ರೋಬೋಟ್‌ನ್ನು ಬಳಸಬಹುದಾಗಿದ್ದು, 17 ಕೆ.ಜಿ. ತೂಕದ ಯಾವುದೇ ವಸ್ತುವನ್ನು ಈ ರೋಬೋಟ್ ಹೊತ್ತೊಯ್ಯಬಲ್ಲದು. ಪ್ರಸ್ತುತ ಈ ರೋಬೋಟ್‌ಗೆ 45 ನಿಮಿಷಗಳ ಕಾಲ ಕಾರ್ಯಾಚರಣೆಗೊಳಪಡಬಹುದಾದ ಸಾಮರ್ಥ್ಯದ ಬ್ಯಾಟರಿ ಅಳವಡಿಸಲಾಗಿದೆ ಎಂದು ರೋಬೋಟ್ ಆವಿಷ್ಕಾರಗೊಳಿಸಿರುವ ವಿದ್ಯಾರ್ಥಿನಿ ಕು. ರಮ್ಯ ಎಂ.ಎನ್. ಪರ್ವ, ಅನಿರುದ್ಧ, ಎಂ. ಅರವಿಂದ ವಲ್ಲಭನ್ ಸುದ್ದಿಗೋಷ್ಠಿಯಲ್ಲಿ ತಿಳಿಸಿದರು.

ಪ್ರಸ್ತುತ ಅಂಧರು ನಡೆದಾಡಲು ವಾಕಿಂಗ್ ಸ್ಟಿಕ್ ಬಳಸುತ್ತಿದ್ದಾರೆ. ಕಾರಣ ಅವರಿಗೆ ಅನುಕೂಲ ಮಾಡಿಕೊಡುವ ಉದ್ದೇಶದಿಂದ ಅತ್ಯಾಧುನಿಕ ಈ ರೋಬೋಟಿಕ್ ಸ್ಟಿಕ್‌ನ್ನು ಬಳಸಿಕೊಳ್ಳಬಹುದಾಗಿದೆ. ಈ ರೋಬೋಟಿಕ್ ಸ್ಟಿಕ್‌ನ್ನು ಬಳಸಿ ನಡೆಯುತ್ತಿರುವ ವೇಳೆ ಮುಂದಿನ 50 ರಿಂದ 100 ಕಿ.ಮೀ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಯಾವುದೇ ವಸ್ತುವಿದ್ದರೆ ಅದನ್ನು ವೈಬ್ರೇಷನ್ ಮೂಲಕ ಮಾಹಿತಿ ನೀಡಲಿದೆ. ನೀರು ಕಂಡು ಬಂದರೆ ಶಬ್ದದ ರೂಪದಲ್ಲಿ ಸೂಚನೆ ನೀಡಲಿದೆ. ಪ್ರಸ್ತುತ ಬಳಸುತ್ತಿರುವ ಅಂಧರ ವಾಕಿಂಗ್ ಸ್ಟಿಕ್‌ನಲ್ಲಿ ಇಂತಹ ಸೌಲಭ್ಯಗಳು ಇಲ್ಲ ಎಂದು ಅವರು ತಿಳಿಸಿದರು.

ಈ ಸಂದರ್ಭದಲ್ಲಿ ಕಾಲೇಜಿನ ಪ್ರಾಧ್ಯಾಪಕ ಕೆ.ಎನ್. ರವಿ, ಎಸ್.ವಿ. ಪಲ್ಲವಿ, ಪವನ್ ಕುಮಾರ್, ಪೂರ್ವ, ಶಿಲ್ಪ ಮಿತ್ತಿರರು ಉಪಸ್ಥಿತರಿದ್ದರು.

ಅಂಧರು ಸುಲಭವಾಗಿ ನಡೆದಾಡಲು ನೂತನ ವಾಕಿಂಗ್ ಸ್ಟಿಕ್‌ನ್ನು ನಗರದ ಸಪ್ತಗಿರಿ ಇಂಜಿನಿಯರಿಂಗ್ ಕಾಲೇಜು ವಿದ್ಯಾರ್ಥಿಗಳು ಆವಿಷ್ಕಾರಗೊಳಿಸಿದ್ದು, ಇಂದು ಪ್ರೆಸ್ ಕ್ಲಬ್‌ನಲ್ಲಿ ಮಾಧ್ಯಮದವರ ಮುಂದೆ ಪ್ರದರ್ಶಿಸಿದರು.

ಭಾವೈಕ್ಯತೆ ನಶಿಸಿ ಬಂದೂಕು ಸಂಸ್ಕೃತಿ ವಿಜೃಂಭಣೆ

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ದೃಷ್ಟಿಹೀನರಿಗಾಗಿ ಸೆನ್ಸರ್ ಸ್ಮಾರ್ಟ್ ಸ್ಟಿಕ್ !

Blind man Smart Stick

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An English translation of "Andharige Walking Stick"

BLIND MAN STICK

Bangalore July 2: To help victims of natural calamity, war, emergency, mining disaster a novel robot and a novel walking stick is designed by students of Sapthagiri College of Engineering.

This robot has 18 servers and can maneuver in any terrain. It has the capacity to change direction and can be controlled by internet. It can be used in case of emergency and it can carry 17Kgs of weight. Prof. Ramya, M.N. Harsha, Anudeep and M. Aravind claim that the battery life of this robot is 45minutes.

At present, blind use a walking stick and hence a novel robotic stick is designed. This gives the outline of the place to a radius of 50 to 100 Kms. This facility is not available in the present blind stick.

In this context Prof. K.N. Ravi, N.S. Pallavi, Pavan Kumar, Poorva, Shilpa were also present at the gathering.

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Traffic Signal Control System for Ambulance

Prakash Jadhav, Dinesh K Anvekar, H.C.Sateesh Kumar,

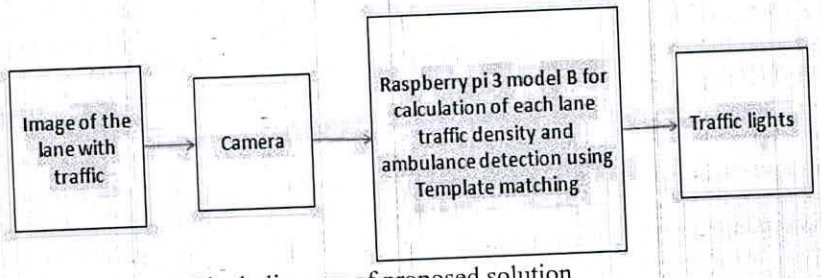
Abstract: Traffic Jam now a days is common in all metropolitan cities. Due to this peoples are suffering a lot, especially the patients are suffering lot. Patients may expire if they may not able reach to the hospital within the short time. Sometimes traffic police struggling to clear the road for the ambulance even though the buzzer sound siren. The vehicles may not move due to, bumper to bumper jam in major cities. Based on this traffic signal many researches have done for the road clearance for the ambulance.Also a decisive reason is the inadequate infrastructure that cannot manage the traffic problem. Traffic rules and signs are generally used to regulate this issue. Traffic lights are normally both manually and automatically controlled. Timers are the easiest way to automatically regulate the traffic light for each stage.Another way is to use electronic sensors for vehicle detection and signal generation. Indeed, these Traffic Jams are t he reasons not to arrive at hospitals in time.

The new research proposing here based on the radio signal transmission to the antenna which is proposed near the traffic pole, based on the signal immediately the signal changes from red to green signal till the ambulance crosses the signal.

I. INTRODUCTION

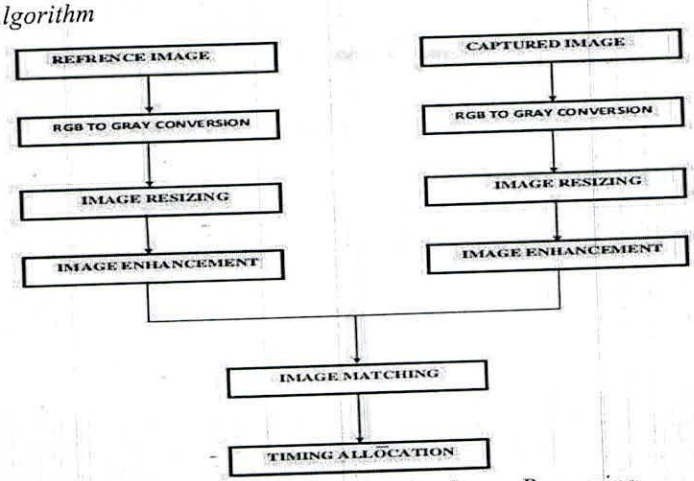
The number of vehicles on the road increases day by day, so it is important to manage the traffic flow efficiently for the best use of existing road capacity. In particular in the towns, traffic congestion has become a severe problem. The main reason for this is the increase in the population of large cities that subsequently raise vehicle travel, which creates problem of congestion.There is also a growing cost of transportation due to moment wastage and additional fuel consumption due to traffic congestion. Traffic jams also create many other critical issues and issues that directly affect the lives of the human routine and cause the loss of life at times. For instance, if an emergency vehicle such as an ambulance is on the highway with the critical patient on board.If an ambulance gets stuck in a heavy traffic jam in that situation, then there are high chances that the patient will not be able to reach the hospital on time. To avoid accidents, collisions and traffic jams, it is therefore very important to design an intelligent traffic system that intelligently controls traffic. An inefficient traffic signal is the most prevalent reason for traffic congestion in this world country. For instance, if one lane has less traffic and the other lane has enormous traffic but the duration of green light for both lanes is the same then this is the waste of available resources and is inefficient. If the lane with greater traffic density is to turn on the green signal light for a longer period than the lane with lower density, consider the example above.

Block Diagram Of Proposed Solution



Block diagram of proposed solution

Traffic Density Detection Algorithm



Block Diagram of Traffic Control using Image Processing

1. Reference image and the image to be matched is continuously captured using a camera that is installed at the junction.
2. The output images of previous step are matched using pixel to pixel matchingtechnique.
3. After matching the timing allocation is done

dependingon The percentage of matchingas

If the matching is between 0 to 10%- green light is on for 50 seconds.
If the matching is between 10 to 20% - green light is on for 45 seconds.
If the matching is between 20 to 30% - green light is on for 40 seconds.
If the matching is between 30 to 40% - green light is on for 35seconds.
If the matching is between 40 to 50% - green light is on for 30 seconds.
If the matching is between 50 to 60% - green light is on for 25 seconds.

If input image is of size (WxH) and template image is of size (wxh), output image will have a size of (W-w+1, H-h+1). Once you got the result, you can use cv2.minMaxLoc() function to find where is the maximum/minimum value. Take it as the top-left corner of rectangle and take (w,h) as width and height of the rectangle. That rectangle is your region of template.

If the matching is between 60 to 70% - green light is on for 20 seconds.
If the matching is between 70 to 80% - green light is on for 15 seconds.
If the matching is between 80 to 90% - green light is on for 10 seconds.

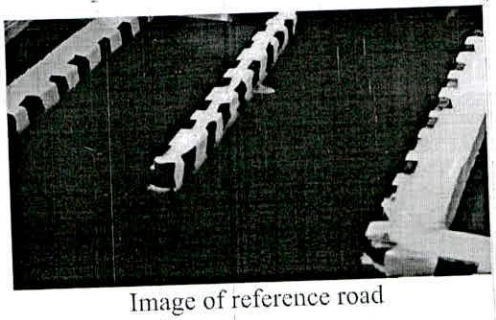


Image of reference road

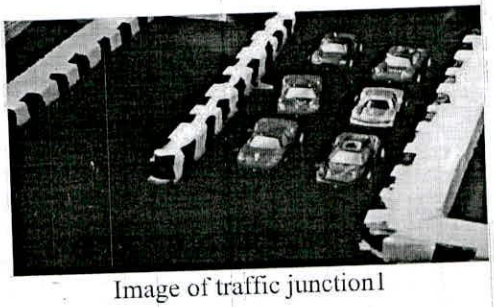
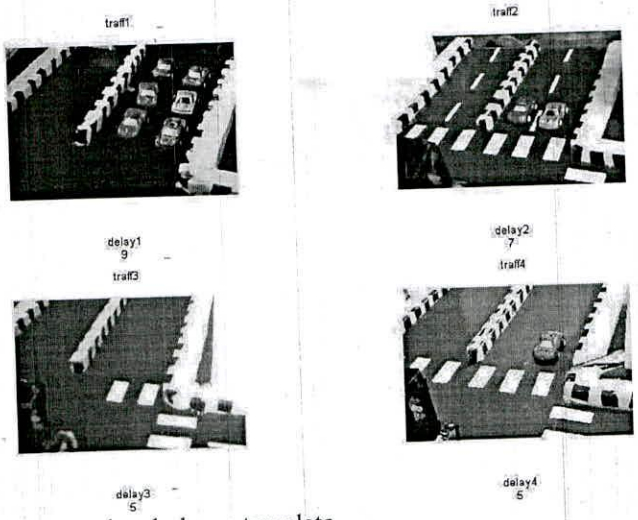


Image of traffic junction1

SimulationResults



Detected ambulance template

Ambulance in traffic

Ambulance template

Final output

CONCLUSION

A technique is provided in this article to estimate traffic using image processing. "Traffic control using image processing" method that overcomes all the constraints of the previous traffic control methods used. Using the algorithm eliminates the need for additional hardware like sound sensors.For these vehicles, the enhanced response time is essential to preventing loss of lives. The major benefit is the signal time variation that uses picture matching to regulate the suitable traffic density. High-priority vehicles can be identified with a high degree of precision that helps prevent traffic congestion from losing lives.

The benefits of this new technique include the use of image processing over sensors, low price, simple configuration, and comparatively excellent precision and velocity. Because this technique was implemented using image processing and PYTHON-OPENCV software, the cost of manufacturing is small while achieving high velocity and precision and identifying violations of vehicle spiral movements.

The precision of time calculation owing to single moving camera relies on the position of the registration while facing the street each time. This technique reduces the use of additional hardware devices such as sensors, wireless routers, GSM modems, monitoring station set-up etc. Vehicle detection presence is consistent as traffic pictures are taken here.Reality is visualized and therefore functionality is more efficient and effective than any technique.

Students from Sapthagiri College of Engineering presending a censor-based traffic signal in Bengaluru on Wednesday | SHRIRAM B N

STUDENTS INVENT DEVICE TO HELP AMBULANCES IN TRAFFIC

EXPRESS NEWS SERVICE
@ Bengaluru

TO tackle one of the recurring problems in the city - heavy traffic disrupting emergency health services - a group of students have come together to find a solution. They are now patenting their 'Traffic Control System', which will be an innovative solution for traffic police who struggle to make way for ambulances stuck behind rows of vehicles at signals.

Students of Sapthagiri College of Engineering, under the guidance of their professors Dr Dinesh K Anvekar and Dr Sasmita Mohapatra, created a light sensor of sorts that will detect the light pulse sequence of the ambulance. With this, traffic police can manually operate signals and let ambulances pass.

> The traffic lights control system consists of a light code sequence detector mounted above the red traffic light, and a light pulse sequence emitting torch. The light pulse sequence is detected by a light sensor interfaced to a micro-controller. The torch has a micro-controller that produces a pre-determined sequence of light pulses
>
> Group of students

The team of students includes fourth-semester Electronics and Communication Engineering students Nitin B S, B K Harshit, Prathika V M and Dhanush Bharadwaj H P.

"The electronics and communication functions of the system are implemented by two micro-controller boards in the traffic light unit and one micro-controller within the torch," said the students.

The traffic lights control system consists of a light code sequence detector mounted above the red traffic light, and a light pulse sequence emitting torch. The light pulse sequence is detected by a light sensor interfaced to a micro-controller. The torch has a micro-controller that produces a pre-determined sequence of light pulses," the group said.

Since the light sensor is placed against a 'conspicuous black-yellow pattern' board, it will aid the ambulance driver in heavy traffic.

"The light code sequence detector recognises light sequences and signals the traffic light control circuit to switch immediately to green and allow the ambulance to pass," they added.

The invention has been filed for patent issue by the Indian Patents Office, they added.

Wheelie menace: Traffic cops to grill mechanics

IFFATH FATHIMA @Bengaluru

JUST a week ago, *The New Indian Express* had a report on the Bangalore Traffic Police (BTP) carrying out special drives to crack down on people popping wheelies and drag racing. Now, the traffic police have not only decided to nab riders but are also on the lookout for mechanics and garages who modify these bikes and cars for drag racing. They will get details from these places on such riders.

"Come Friday, we will launch a strict enforcement drive to curb drag racing. The traffic police will locate spots where drag races take place and will nab people who participate. Not only riders, we will also go to different automobile engineering stations, garages, mechanics and those involved in the modification of cars and bikes to warn them," said Additional Commissioner of Police (Traffic) Harishekaran P.

This apart, the traffic police will also check their social media handles to find complaints of wheelie popping and drag racing. "If people tag us with a picture and a clear registration number, it will be easier to nab people responsible," said a senior traffic police officer.

Harishekaran also pointed out that this time there will be no fines. A case will be booked immediately and the owner will be arrested. "All the drag racers will be caught and questioned about other drag racers they know. Though we have seen a comparative decrease in cases from last year, it's high time we put an end to this," he added.

INDIAN EXPRESS

System for Swift Passage Ambulances

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

JNANA SANGAMA, BELAGAVI -590018

A Project Report On

"DESIGN AND FABRICATION OF ARTICULATED 3-D PRINTER"

Submitted in partial fulfilment of the requirement for the award of

BACHELOR OF ENGINEERING
In
MECHANICAL ENGINEERING

Submitted By

Mr. CHETAN GOWDA H S	**(1SG16ME402)**
Mr. MANISH RAO S	**(1SG16ME416)**
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Under the Guidance Of
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College of Engineering

CERTIFICATE

Certified that the project work entitled **"Design and Fabrication of Articulated 3-D Printer"** carried out by **Chetan Gowda H S (1SG16ME402), Manish Rao S (1SG16ME416), Poorvik S (1SG16ME426), Rohith J (1SG16ME434)** Bonafide students of 8th semester, Department of **Mechanical Engineering** at **Sapthagiri College of Engineering,** Bengaluru in partial fulfilment of the award of **Bachelor of Engineering** in **Mechanical Engineering** of the **Visvesvaraya Technological University,** Belagavi during the year 2018-19. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Dr. M Elangovan	Dr. P Mahadevaswamy	Dr. K L Shivabasappa
Signature of the Guide	**Signature of the HOD**	**Signature of the Principal**

Examiner

Name of the Reviewer	Signature with date
1. Dr. Mahadeva Swamy P	11/6/19
2. Dr. Kiran T.S	11/6/19

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ABSTRACT

This project introduces the implementation of a low-cost 3D printing Robotic Arm. Articulated Robotic Arms made up of several joints and actuated by motors are generally used in industrial field for lifting and manufacturing purposes. 3D printers are machines used for converting digital 3D model into physical 3D object. 3D object can be build by using Additive Manufacturing process. In AM process successive layers of material are laid one upon another and the process repeats until the final object is obtained. The additive process used in this project is Fused Filament Fabrication. By using this method, it is able to print object more accurately and smoothly. FFF model uses thermoplastic filament that is wound on a coil and unreeled to supply material through cold end of an extrusion nozzle, which turns the flow on and off. The hot end of the extruder melts the material and can be moved in both horizontal and vertical directions. Both the movement of robotic arm and extruder is directed by a numerically controlled mechanism that is directly controlled by a computer-aided manufacturing software package. The model or part is produced by successively layering the thermoplastic material that is extruded from the nozzle. Movement of extruder is controlled by stepper motor. By combining Robotic arm with 3D printing technology, it is capable for increasing range of operation and it is comparatively more flexible than commercially available desktop 3D printers.

INTRODUCTION

1.1 3-D PRINTER

A 3d printing is an added substance fabricating procedure where 3D articles and parts are made by the option of different layers of material. It can likewise be called as fast prototyping. It is a motorized technique where 3D articles are rapidly made according to the required size machine associated with a PC containing outlines of any item.

The added substance strategy may vary with the subtractive procedure, where the material is expelled from a square by chiseling or penetrating. The primary motivation to utilize 3d printer is for 90% of material use, increment item life, lighter and more grounded. 3D printing is productively used in different fields, for example, aviation, vehicle, restorative, development and in assembling of numerous family items.

1.2 HISTORY

The 3D printing advancement is certifiably not another idea the same number of thinks. Whenever FDM (melded affidavit displaying) licenses had terminated in 2009, the 3D printing turned into another advancement point. Also, due to which it ended up being more standard, people imagined that FDM was the only a solitary included substance delivering framework. In any case, the underlying 3D printing system was SLA not FDM, and its first patent was recorded in 1980's. Here is the verifiable scenery of 3D printing development, from 1980 to today.

In 1980's there was the presentation of 3 essential 3D printing frameworks. Dr. Kodana was the main individual to present layer by layer approach for gathering and moreover he was the key individual to make quick prototyping methodology. In addition, he made an ancestor for SLA. He polymerized a photosensitive gum with the help of UV light, in any case, did not succeed. Amazingly for Dr. Kodana, the full patent detail was not recorded by him before the one-year due date after the application. the reasons for 3d printing development can be pursued from 1983.

In 1983 Charles frame was the individual to complete a patent on stereolithography. Casing planned the term stereolithography in august 8, 1984 patent application for "Contraption for making of 3 dimensional inquiries by stereolithography". Moreover, was the primary individual to make SLA-1 (stereolithography) machine in 1987.Charles structure was the author 3D framework Corporation (one of the greatest and more impel affiliation working in 3d printer division today). Body described stereolithography as the novel procedure which is utilized for making strong articles by printing progressive layers of bright treatable material

over other. In edge's patent, he explains, a concentrated light discharge light is revolved around the surface stacked with a liquid photopolymer. The light beam which is constrained by a PC draws each layer of the model on the outside of the fluid. any place the brilliant light strikes the surface, the photopolymer polymerizes and changes to strong. Utilizing the product CAD/CAM scientifically cuts (changes over into layers) the models. at that point the procedure fabricates the models layer by layer.

During the year 1990's the other 3D printing development and procedures were risen during this year. What's more, the presentation of new 3D printer makers and lowlife apparatuses. 3D frameworks make their first business clearance of stereolithography (SLA) framework. Also, the other rising procedures were ballistic molecule fabricating (BPM) licensed by William experts, strong ground restoring (SGC) was been protected by Itzchak Pomerantz et al.

Moreover, other creating associations saw in the midst of the nineties till today - Stratasys, EOS, and 3D frameworks. The 1990's were the season of first utilization of the 3D printer in medicinal scientists, who merged the method for pharmaceutical and 3D printing and opening the odds to various customers. In 1992 the patent done on melded affidavit demonstrating was issued to Stratasys, who had created may 3D printers both for expert and for people. The SLA (Stereolithographic) mechanical assembly was made in this year by 3D frameworks. The main SLA machine utilizes an UV laser setting photopolymer, and a fluid with the consistency and shade of nectar that makes the item layer by layer. This was the main quick prototyping structure that had changed the building scene and plan for ever.

From 1993-1999, the fundamental entertainers of the 3D printing segment, which had developed with different methods. Sanders model (later Solidscape) and Z Corporation were set up in 1996 as far as business task, Arcam was built up in 1997.

During that time where these 3D printing areas had begun to start the exhibit particular broadening with these two quite certain areas accentuation that is unmistakably characterized today. They were top of the line 3D printing and still they are over the top expensive which were outfitted towards the standard creation for high esteem and complex parts. This are developing quickly and progressing yet the outcomes are presently noticeable underway applications over the car, aviation, medicinal and in gems areas. Furthermore, at the opposite end, a portion of the 3D printing framework makers were creating and propelling the "idea modelers", they were called around then. These 3D printers continued concentrating on by and large advancement and improvement of these working prototyping that were being created on explicitly as these workplaces and easy to use and the practical frameworks. Be that as it may, these frameworks were particularly helpful in modern applications.

At the lower end of market, the 3D printers that today are been seen. During this term there, cost was a war between the 3D printing organizations with the expansion in progress, precision, speed and materials. In 2007 the market saw the main framework under 10,000$ from 3D frameworks however it never hit the market as expected to be. This was because of the market impact of different organizations.

All through in 2000 3D printing innovation continued creating to make lower-estimated models with different highlights. In 2003 there was the new development that 3D printer was utilized to build cells when Thomas Boland of Clemson college protected for the utilization of inkjet printers for printing of cells. To adjust these spotting frameworks for testimony of the cells into the especially sorted out 3D networks set on a substrate this procedure were utilized. The printing of organic structures is known as Bio printing. The thousand years saw the principal 3D printed kidney working. Furthermore, more methods for printing came vigorously, for example, expulsion bio printing, have been inquired about and presented as a methods for generation. Because of which the organs might be printed utilizing bio printing and can be transplanted.

In 2004 the starting of RepRap venture which comprises of a self-duplicating 3D printer. This open wellspring of the RepRap undertaking prompted spreading of FDM 3D work area 3D printers and fame of 3D printers starts from here.

In 2005, Z-Corp propelled the range Z510. The primary shading and top quality 3D printer. The main SLS machine monetarily open in 2000, which offered chances to the producer to construct modern parts. A 3D printing new business Objet assembled a machine that could print more than one material, which permitted a solitary part that can be made and created with various material properties.

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7.2 CONCLUSION

The objective of the project was to design and develop a low cost articulated robot which carries out 3D printing for non-precession applications towards this the robot was designed and developed and fitted with a 3Dprinting end effector the entire device was interfaced through a control device and software customized for this purpose .the printing was successfully carried out for various basic geometry as well as standard solid models using PLA material the work volume of the articulated robot is comparatively larger then the regular cartesian type robot that are presently available .

BUILD VOLUME COMPARED TO FLOOR SPACE CONSUMPTION

Compared to actual 3d printer floor space consumption and our articulated 3d printer we have reduced 40% floor space consumption.

ACCURACY

Within given time frame and money constrains Compared to commercially available 3d printers we have achieved nearly same accuracy, but still greater accuracy can be achieved with further improvement of algorithm, stepper motors, drivers and other hardware components.

CAPABILITY

Most of the 3d printers available commercially are only meant for 3d printing but with our design other then 3d printing it is capable of performing other operations like pick and place, pen plotting, laser engraving, soldering etc.

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Design and Fabrication of Articulated 3-D printer

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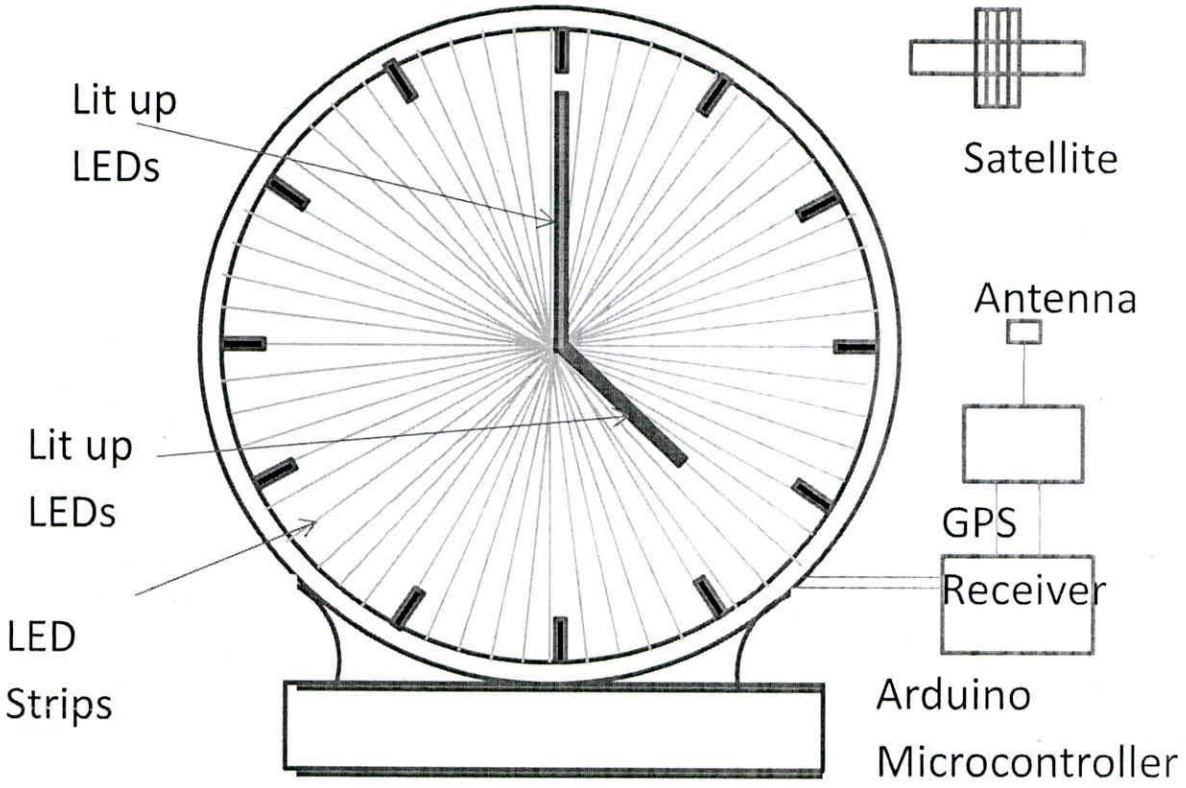
GPS Satellites based accurate clock with analog clock hands



Description:

A unique accurate digital clock based on GPS signals and displaying time like traditional clocks with 3 hands has been developed by the students and faculty of the Sapthagiri College of Engineering. Dr. Dinesh K. Anvekar, Dr. Prakash Jadhav, and Dr. Satheeshkumar H. C., the professors in the Department of Electronics and Communication Engineering of the Sapthagiri College of Engineering have guided the students in developing the clock. The specialty of the clock is that it gets the time information from GPS satellites and displays the time in analog manner even though all processing is done digitally. It has 'moving' second, minute and hour hands, but there are

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no moving parts at all as the impression of motion of hands is created by switching light emitting diode (LED) strings. There is no need to manually adjust the time at any time. Once the clock is powered, it receives GPS signals from a compact antenna from at least 3 satellites and extracts the time value given as GMT. This time is converted to IST by adding the lead time value with reference to GMT. The functions of the clock are implemented with an Arduino microcontroller board and a GPS receiver board. Only an uninterrupted power supply is required to keep the clock running. However, solar panel based power supply has also been included in the design.

The clock is very useful for providing accurate time for public in railway and bus stations and other public utility facilities. As the clock is free of any moving parts the maintenance required is very minimal. The clock hands are displayed using 3 in 1 LED strips with Red, Blue, and Green lights. As the LED lights are bright the hands of the clock can be seen clearly even during daylight. The size of the clock can be minimized to a circle size of 1 foot and such clocks can be used in indoor environments.

The team of students Nandini S., Anusha S.V., Bhumika K.S.,Divyashree R.A. of ECE dept and students Divij N. and Divya K. of CS Dept, and faculty designed and developed the clock in a period of about 3 weeks during their post exam holidays. The cost of the clock which is 3ft in diameter and 3 inches deep is about Rs 10,000/-. The cost can be minimized further by mass production. The minimized 1 ft version of the clock will cost about Rs4000/-.The students have plans to take it forward as an entrepreneurial venture and commercialize it. The project was sponsored by the management of Sapthagiri College of Engineering and was encouraged and supported by the Principal Dr. K.L. Shivabasappa and Adminstrative Officer Dr. K. R. Nagabhushana.

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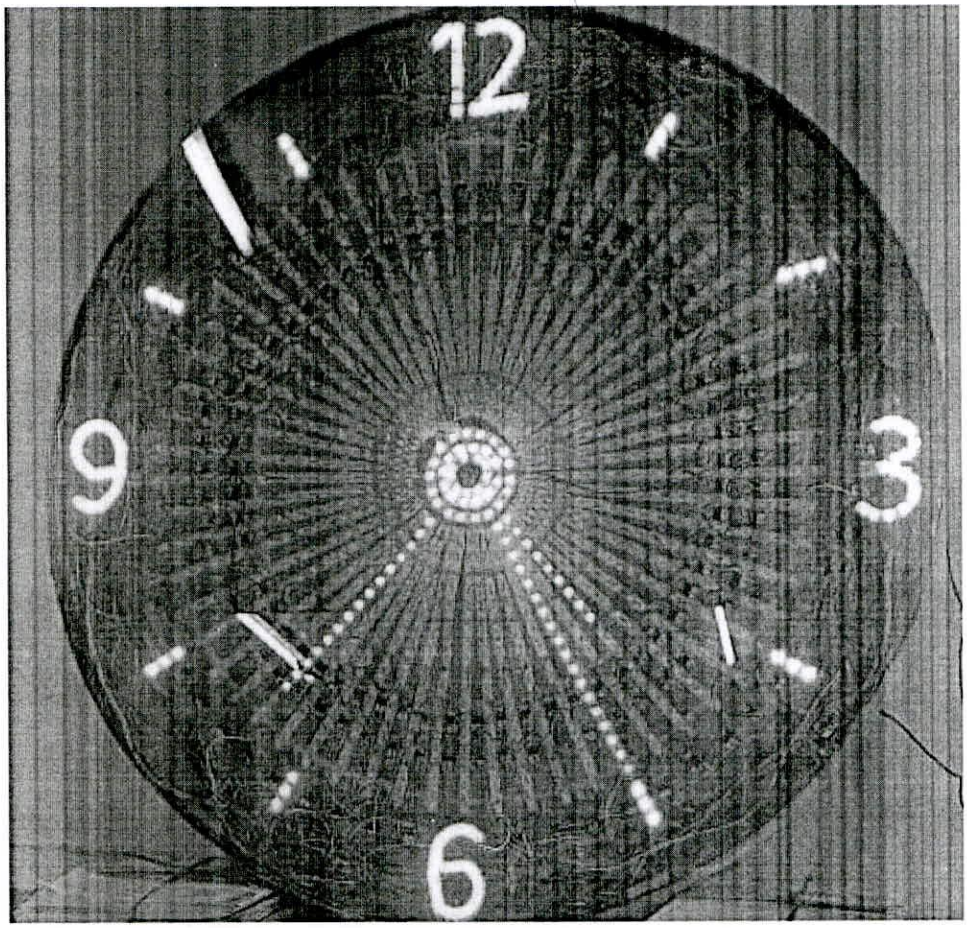

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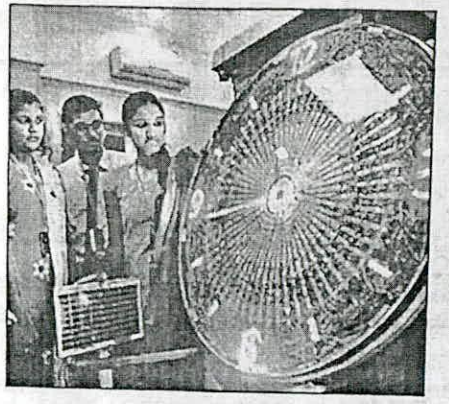
Students create digital clock with LED hands

TIMES NEWS NETWORK

Bengaluru: One glance at this clock will tell you that times have changed! Students and faculty of Sapthagiri College of Engineering have developed an accurate digital clock that gathers time from GPS signals and displays it like a traditional analog clock.

The three-foot-tall clock receives GPS signals from three satellites using a compact antenna and extracts the time value as GMT. It is then converted to IST by adding the lead time value and the time is shown through three hands of the clock.

However, the clock has no moving hands or parts and the impression of movement of hands is created by switching light emitting diode (LED) strings. The clock thus has 1,400 different points to make connections, 2,000 soldering points, 180 Darlington pair transistors, 60 strips of LED and one micro-controller board. "The challenge was to make these LED strips and the connections. One wrong connection could spoil the whole clock," said Nandini S, a student.



CHANGING CHIMES: The clock display creates the impression of needles using LED strings

The clock needs uninterrupted power supply that can come through the solar panels attached to it. "The advantage is that it needs no maintenance as it doesn't have moving parts and batteries. LED has a life of 10-20 years. Also, the time once set needn't be reset again, and it is accurate. The clock can prove useful at railway or bus stations or places like a clock tower where everyday maintenance is difficult," said Dinesh K Anvekar, faculty at the college.

The clock cost Rs 10,000 to make, but it can come down to Rs 4,000 for a one-foot-tall version. The team of students who developed it are: Nandini S, Anusha SV, Bhumika KS, Divyashree RA, Divij N and Divya K under the guidance of Dinesh K, Prakash Jadhav and Satheeshkumar HC.

Digital clock with LED hands