Manoj Sharma

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Tezpur,Assam,India

EDUCATION

Tezpur University	Assam,INDIA
Bachelors of Technology in Mechanical Engineering; CGPA: 7.86/10	*Expected May 2020*
AHSEC	Assam,INDIA
XIIth Grad; %:81.4/100	*May 2015*

COURSEWORK

- **Humanities/Social Science/Management**:Communicative English,Fundamentals of Management,Social Responsibilities and Professional Ethics in Engineering

- **Basic Science**: Mathematics I-IV,Physics I-II, Chemistry,Environmental Science

- **Engineering Science**: Basic Electrical and Electronics Engineering,Introductory Computing,Data Structure and OOPs,Engineering Graphics,Engineering Mechanics,Thermodynamics

- **Professional Core**:Solid Mechanics,Fluid Mechanics,Heat and Mass transfer,Applied Thermodynamics,Material Science,Manufacturing technology,Machine Design,Theory of Mechanisms and machines,Vibration and dynamics of machinery,Systems and Control,Industrial Systems Engineering

SKILLS

- **Languages and libraries**: Python,C, C++,OpenCV

- **Softwares and tools**: MATLAB, Octave, ANSYS Fluent ,HYPERMESH,SOLIDWORKS,ARDUINO

- **Hardware**:Microcontroller-Atmega,Raspberry Pi,stepper motors,brush-less motors,IMU

PROJECTS

- **Double SCARA parallel sketcher Robot**: A robot based on 5 bar parallel manipulator mechanism which can draw sketches
  - Used python programming to solve the inverse kinematics equation of the mechanism,to do processing of all the coordinated of a given image and used atmega328p microcontroller to control stepper motors which control the links of the robot
  - Developed algorithm in python to make the robot able to use gcode and fill missing coordinates to maintain desired level of smoothness of lines/curves.
  - Developed algorithm to keep track of the error in movement of the links which also try to correct the error with each new input without the use of close loop control.
  - Demo: [Youtube]() |

- **Balance Ball**: Balancing a ball on a single degree of freedom platform using computer vision and PID control
  - Used video feed from webcam and processed in python using OpenCV computer vision library to determine the ball's position on the platform
  - Used PID algorithm for sending appropriate signal to a microcontroller over the serial port controlling the servo motor to prevent the ball from falling.
  - Demo: [Youtube]() |

- **Gaming Bot** : Implemented computer vision technique and used python programming to make a gaming bot which can play the Google Chrome's Dinosaur game
  - Demo: [Youtube]()|

- **High Endurance Tricopter Drone**: Made a lightweight,high endurance Tricopter drone along with a RC trans-receiver based on NRF24 module with arduino Uno(atmega328p) having an line of sight control distance of over 1 KM
  - The design of the drone is of modular type with easily replaceable arms and is made of light weight but strong materials such as hollow PVC pipes and plywood resulting in a flight time of over 20 minutes on a 4000 maH Lithium polymer battery
  - The flight-controller runs multiwii flight controller firmware.The flight controller is made using an arduino nano and MPU6050, a 6 axis accelerometer+gyroscope sensor
  - The receiver on the drone is another NRF24 low power module connected to the flight controller arduino nano
  - Demo: [Youtube]() |

- **Remote Control airplane with PID controller**: Made a remote controlled airplane and it's control systems having a control range of over 1 KM.

- Made the remote controller using NRF24 transreceiver (PA and LNA version)
- Implemented PID control using MPU6050 inertial measurement unit for self-balancing resulting in high stability in windy/bad weather conditions
- Demo: [Youtube |](#)

- **Home Automation**: Automated the lab of the Tezpur University Robotics Society with automatic light control ,temperature controlled fans,automatic window curtains and RFID door lock system

ACHIEVEMENTS & AWARDS

Robotics Competition Runner Up   Assam,INDIA
Techniche,IIT Guwahati   *September 2018*

- Participated in the PHOTOTRON event of the ROBOTICS module organised during Techniche 2018 between 30th Aug-2nd Sept 2018 and secured the 2ND position.Task was to use image processing and build a mobile robot which can recognise various shape and navigate itself through the arena and return back to home.

RC Car Race Competition Winner   Assam,INDIA
Techxetra 2k17,Tezpur University   *November,2017*

- Task was to build a remote controlled car and race with it to complete the track in least time possible.

Anundoram Borooah Award   Assam,INDIA
Education(Secondary) Department,Government of Assam   *November,2013*

- In recognition of the excellent performance in securing First Division with Star Marks in HIGH SCHOOL LEAVING CERTIFICATE Examination,2013 conducted by the Board of Secondary Education,Assam

TRAININGS & WORKSHOPS

Workshop on Drone and its Application
Tezpur University,Asian Institute of Technology(Thailand)   *March,2018*

- ∗ Participated in the workshop on "Drone and its Applications:Harnessing full potential through Industry Acedemia Interactions" jointly organised by Geoinformatics Centre,Asian Institute of Technology,Thailand and Centre for University-Industry interface,Tezpur University

ANSYS Training Program
T&P Cell,Tezpur University supported by AICTE(NEQIP),New Delhi,India   *December 15-29,2017*

- ∗ Learned about cleaning of geometry, doing finite element modelling using HYPERMESH software and then taking the model to ANSYS to perform analysis.

Aeromodelling Workshop
EduRade,India   *November,2016*

- ∗ Had hands-on learning employing:Design concept of RC Aircraft,fabrication based upon design calculation and then validating the design through flight test

EXPERIENCE

India Oil Corporation Limited   Guwahati, INDIA
Intern,Guwahati Refinery   *January 2019*

POSITION OF RESPONSIBILITIES

Technical Team Lead,Tezpur University Robotics Society
Tezpur University   *2018-present*

- · Tezpur University Robotics Society (TURS) was founded in 2010 to promote exchange of information about robotics to stimulate education in the sciences, and to promote the enjoyment of robotics as a hobby.My job as a technical team lead is to share my knowledge and help and guide teams and society members through project spread over fields like home automation ,CNC machines.

Intershala Student Partner
Internshala   *2019-Present*

- · As an student partner of internshala my work is to assist my peers into getting internshala internships and inform them about the latest training offers and help them learn new skills via Internshala training.