Shaunak Mehta

Final Year Undergraduate | Mechanical Engineering | IIT Jodhpur
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EDUCATION

Degree	Institute	Year	CPI/Percentage
BTech-Mechanical	Indian Institute of Technology Jodhpur, India	Expected 2021	8.07 / 10
Higher Secondary	Nirmala Memorial Institute of Commerce and Science, Mumbai, India	2017	86.15 / 100
Senior Secondary	Swami Vivekanand International School, Mumbai India	2015	95.4/100

PUBLICATIONS

STUDENT MIXTURE MODEL BASED VISUAL SERVOING
Publisher: Robotics and Autonomous Systems (RAS) (under review)
Preprint available at arXiv:2006.11347v1

INTERNSHIP EXPERIENCE

MECHATRONICS, INSTRUMENTATION AND CONTROL LAB (MICL), IIT PATNA | Guide - Dr.Atul Thakur
May 2019 – July 2019 | Indian Institute of Technology Patna, India

Laparoscopic Simulator With 3 DoF Haptic Feedback

- Aimed at the development of a novel kinesthetic haptic device for laparoscopic simulation.
- Worked on user interaction with virtual organs instead of cadavers for realistic experience, for training and improving the skills in surgical process of laparoscopy.
- Achieved force feedback in x and y direction using a cable driven parallel mechanism and in z direction using a ferrofluid based damper and a capstan drive mechanism.

AUTOMATION + MECHANICAL ENGINEERING INTERN |GODERJ INTERIO
May 2018 – July 2018 |Godrej Interio, Mumbai, India

Design and Development of a Rail Guided Vehicle (RGV)

- Designed and prototyped an automated vehicle for inter plant material transfer to reduce risk of human lives and to improve efficiency.
- Integrated LIDAR sensor for working in an open environment to avoid the obstacles in its path for the purpose of avoiding hazards. Link to Model on Grabcad

PROJECTS

Image Based Visual Servoing for Tumbling Objects
June 2020 – Present | Guide - Dr. Suril Shah | IIT Jodhpur , India

- Extracted feature points from an uncooperative tumbling object to create an elliptical track in the image plane. The controller minimizes the error between the current elliptical track and the desired features.
- This algorithm was successfully implemented on a 6 DoF UR-5 robot.
- Working on grasping of tumbling objects and implementation of the algorithm on a dual arm system for On-Orbit Service .

Student Mixture Model Based Visual Servoing
August 2019 – June 2020 | Guide - Dr. Suril Shah | IIT Jodhpur , India

- Developed a novel approach for visual servoing based on student t-distribution mixture model (SMM)
- Successfully achieved image modelling using SMM, analytically formulated interaction matrix and a SMM based framework for Image Based Visual Servoing (IBVS) without any requirement of feature tracking and correspondence.
- Systematic experimental validation was carried out using various test scenarios,test objects (shapes and sizes), object textures, obstacles etc. showing promising results.

Vision Based Control of UR-5 Manipulator

January 2019 – April 2019 | Guide - Dr. Suril Shah | IIT Jodhpur , India

- Studied the Basic Visual Servoing algorithm and operation of UR-5 Robotic Manipulator.
- Successfully controlled the position, velocity and acceleration of 6 Degree of Freedom UR-5 manipulator using ROS.
- Multiple feature detection and tracking was achieved with the implementation of visual servoing algorithm.

Bluetooth Controlled Car with Obstacle Avoidance

January 2018 – April 2018 | IIT Jodhpur , India

- Interfaced a battery operated vehicle with smartphone with the help of a HC-05 bluetooth module using an Arduino platform.
- Developed an application to connect to and control the car using the smart phone.
- A SONAR interfaced with an Arduino platform was used to scan the surrounding areas for obstacles and accordingly govern the car to safety surpassing the input given by the smartphone.

SKILLS

Robotics Tools	Design and Simulation Tools	Programming Languages	Other
• Robot Operating System (ROS)	• Fusion 360	• Python	• LaTeX
• MATLAB	• COMSOL Multiphysics	• C++	• Linux
• Beaglebone	• SolidWorks		• ADAMS
• Arduino	• Unity 3D		

COURSEWORK

Mechanical (Core)	Mathematics	Specialization in Robotics
• Kinematics of Mechanisms and Machines	• Calculus and Linear Algebra	• Introduction to Robotics
• Dynamics of Mechanisms and Machines	• Complex Analysis and Differential Equations	• Artificial Intelligence
• Design on Machine Elements	• Probability Statistics and Random Processes	• Nanosensors
• Computer Programming	• Statistical Techniques	• Machine Learning (MOOC)
• Mechatronics	• Optimization	

ACHIEVEMENTS

- Score of 319 (Q - 170, V - 149, AWA - 4.0) in GRE
- Score of 111 (R - 29, L - 29, S - 27, W - 26) in TOEFL
- Successfully competed with 1.2 million students in Joint Entrance Exam and figured in the top 0.5 percent to secure a seat in the prestigious IITs.|2017

POSITIONS OF RESPONSIBILITY

Student Guide, Student Counselling Service, IIT Jodhpur

Mentored a group of eight freshmen to get accustomed with the new transformation to IIT Jodhpur, and organized workshops and sessions on mental health and related issues.

Volunteer, National Workshop on Human Centered Robotics (NWHCR), IIT Jodhpur

Volunteered at a 2 day-long Workshop in March 2018 which aimed at giving exposure to recent advances in the area of human centered robotics and rehabilitation to the participants.

Student Head, Pronites, Ignus 2020 - Socio-Cultural Festival, IIT Jodhpur

Coordinated the pronite events, managed the artists and their crew, managed the budget and ensured smooth functioning of the pronites team during the fest

EXTRA CURRICULAR

- Active member of Robotics Club, IIT Jodhpur
- Active member of Drama Club, IIT Jodhpur
- Represented IIT Jodhpur Robotics team at IIT Bombay Techfest 2018, IIT Bombay.