# Siddhant Saoji

Final year B.Tech | Mechanical Engineering| Robotics | IIT Jodhpur
sziddhant.github.io | saoji.1@iitj.ac.in | (+91)9673262082

## EDUCATION

### Undergraduate (B.Tech)

IIT Jodhpur |Expected 2021
Mechanical Engineering
Minor: Robotics and Mobility Systems
CGPA: 8.96 /10 (Dept. rank 1 )

## LINKS

Github:// sziddhant
Git-IOC:// saoji
LinkedIn:// siddhant-saoji

## ACHIEVEMENTS

- Semi-finalist DST and Texas Instruments, IICDC Contest 2018 and 2019
- 1ST Runner Up in Microsoft codefundo++ 2019 at IIT Jodhpur

## SKILLS

### Programming

Languages: •C/C++ • Python
Tools: •Tensorflow •Keras •OpenCV

### Softwares

• MATLAB • Adams • MoveIt!
• Cinderella • Gazebo • VRep

### Other technologies

• ROS • Raspberry Pi
• Arduino • NodeMCU • Beaglebone

## COURSEWORK

### Credit

Introduction to Robotics
Swarm Robotics
Autonomous Systems*
Artificial Intelligence- 1
Smart Manufacturing
Kinematics of Machines and Mechanisms
Linear Algebra and Calculus
Computer Programming
Mechatronics

### Audit

Machine Learning
Convolutional Neural Networks
*ongoing courses

## EXTRACURRICULAR

- Represented institute Quiz club in Inter-IIT Cultural Meet.
- Represented college basketball team in Sangram 2018 at IIT Roorkee.
- Participated Tech-Fest, IIT Bombay.

## VOLUNTEERING

- **Aeromodelling Club** |Captain
- **Quiz Club** |Vice-Captain
- **Robotics Club** |Core Member

## PUBLICATIONS

### Learning-based Approach for Estimation of Axis of Rotation for Markerless Visual Servoing to Tumbling Objects (Submitted)

Advances in Robotics, AIR 2021| 30 June - 4 July 2021 | IIT Kanpur, Kanpur, India

### Flexibly configuring task and motion planning problems for mobile manipulators

25th IEEE International Conference on Emerging Technologies and Factory Automation, ETFA 2020 | 8 Sept - 11 Sept 2020 | TU Wien, Vienna, Austria
DOI: 10.1109/ETFA46521.2020.9212086

## EXPERIENCE

### Division of Robotics, IOC-UPC | Internship

Advisor: Prof. Jan Rosell |April 2020- Sept 2020| Barcelona, Spain

- Worked on Task and motion planning for mobile manipulators.
- Developed multiple ROS packages and simulations on TiaGo robot.
- Made contributions to various projects includingThe Kautham Project

### ISRO Inertial Systems Unit | Internship

June 2020- Aug 2020| Thiruvananthapuram, India

- Integrated MoveIt path planning and perception pipeline with Gazebo for the task of obstacle avoidance during manipulation in static environments.
- Created the URDF and simulated the humanoid robot designed by ISRO.
- Reduced the convergence time and stdied the performance of various path planners with and without obstacles in a static environment.

## PROJECTS UNDERTAKEN

### Vision based control and Motion Planning for Half Humanoid Robot* | ISRO RESPOND project

Advisor: Dr Suril V Shah and Dr Rajendra Nagar| June 2020 - Present

- Set up and controlled the custom half humanoid developed by ISRO using ROS
- Extracted pose using vision data in 3D Cartesian space to implement motion planning with and without obstacles using MoveIt
- Implemented eye to hand Image Based Visual Servoing on ISRO robot

### Featureless IBVS for Tumbling Objects |Summer 2020 and BTP

Advisors: Dr Suril V Shah, Dr Rajendra Nagar | IIT Jodhpur| April 2020 - Jan 2021

- Created a dataset of 600k videos of tumbling objects using Blender.
- Trained CNN to extracted static features of tumbling object using optical flow
- Simulated Position Based Visual Servoing using the extracted features in VRep.

### Vision Based Manipulation and Grasping |ISRO RESPOND project

Advisor: Dr Suril V Shah |November 2019- June 2020

- Simulated the Reachy 7 DoF Robotic Arm in Gazebo by adding actuators and Velocity Controllers using ROS Control package.
- Created the URDF and controllers for custom robot designed by ISRO.
- Implemented eye to hand Image Based Visual Servoing in Joint Space in Gazebo

### qRRT:Quality Biased Incremental RRT for optimal motion planning |Summer Project 2019

Advisor: Dr Suril V Shah | IIT Jodhpur| May 2019- September 2019

- Biased the nodes of Rapidly Exploring Tree for better faster and smoother solution trajectories using Deep Reinforcement Learning.

### Voting Vader | Blockchain | IoT | Microsoft Code.fun.do++ '19

Open Sourced Github | Submission video YouTube

- An IoT based EVM built on Raspberry Pi using Azure Blockchain Service as the backend serving through REST APIs and hardware authentication using RFID

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