Rugved Katole

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Education

Birla Institute of Technology and Science, Pilani	**Fall 2018 − Summer 2022**

B.E. , Mechanical Engineering; CGPA: 8.52

Bachelor Thesis: Prioritized patrolling of a structured environment using multiple autonomous vehicles

Experience

Research Assistant | ARMS Lab, Indian Institute of Technology Bombay **Summer 2022 − Present**
Supervisor: Prof. Arpita Sinha

- Developing motion planning stack for self-driving cars.
- Designing MPC framework for safe overtaking and aborting maneuvers in Self-driving cars.

Research Intern | Dhio Research and Engineering Pvt. Ltd. **Summer 2020**
Supervisor: Santosh N. L.

- Designed a pressure vessel in accordance with ASME standards.

Projects

Prioritized patrolling of a structured environment | *Robotics* **Spring 2022 − Summer 2022**
Supervisor: Prof. Arpita Sinha ARMS Lab, IIT Bombay

- Developing and simulating patrolling strategies using ROS and SUMO simulator.
- Implementing developed strategy on Firebird V robots.

Distributed Consensus in Multi-Vehicle Cooperative Control | *Robotics* **Fall 2021 − Spring 2022**
Supervisor: Prof. Rakesh R. Warier BITS Pilani

- Implementing multi-agent consensus, flocking, and formation algorithms.
- Creating a Graphical User Interface(GUI) for simulating different dynamics of Multi-agent systems.

Denoising DIC Displacement Images | *Computer Vision* **Fall 2021 − Spring 2022**
Supervisor: Prof. Iniyan Thiruselvam BITS Pilani

- Developing and efficiently training a deep learning pipeline with 40,000+ images.
- Achieved an MSE of 2.12×10^{-5} and reduced noise by 98.89% for test data.

Noise reduction of Centrifugal Pump | *Computational Fluid Dynamics* **Fall 2020 − Summer 2021**
Supervisor: Prof. Pritanshu Rajan BITS Pilani

- Designed and simulated trapezoidal impeller blade geometries for noise reduction.
- Performed Acoustic analysis on pumps with modified blade design.

Publications

Autonomous intersection management at small intersections without communication
Sushant Suryawanshi, Rugved Katole, Arpita Sinha IEEE IVS 2023 (To be Submitted)

Reactive Algorithms for Multiple Agents Prioritized Patrolling
Rugved Katole, Deepak Mallya, Arpita Sinha, Leena Vachhani, IEEE Robotics and Automation Letters (To be Submitted)

Effects of the Impeller Vane Trailing Edge Grooves on Flow-Induced Noise of a radial impeller pump
Rugved Katole, Rajavamsi Gangipamula, Pritanshu Ranjan, Ranjit S patil, (To be Submitted)

MEMS based pressure sensor for detection of negative pressure wave in subsea pipelines
Sumit Kumar, Dhyan Patel, Rugved Katole, Ujwal Gandhi, 65th DAE Solid State Physics Symposium (2021)

Relevant Coursework

- Mechanisms and Robotics
- Control Systems
- Modern Control Systems
- Digital Image Processing
- Mobile Robotics*
- MEMS

Technical Skills

- Python
- MATLAB
- ::ROS ::ROS2
- Computer Vision
- C++ Language
- Deep Learning
- Solidworks
- Git versioning

Leadership

SAE BITS Goa **Fall 2020 – Fall 2021**

Chairperson BITS Pilani

- Managed a club with more than 150 student members participating in various engineering design challenges.
- Mentored new student members and organized webinars to aid technical knowledge.

BITS Goa Racing **Fall 2020 – Fall 2021**

Team Manager BITS Pilani

- Managed a team of 50 members designing a formula student car.
- Designed workflows and raised sponsorship worth 150K INR through various modes.

Social Work

Instructor | Cause: Education **Spring 2020**

Center for Technical Education

- Taugh Freshmen students engineering design and analysis basics by leveraging latest software.

Volunteer | Cause: Educational Awarness **Feb 2019**

BITS Goa Racing

- Spreading awareness about STEM careers among school students in goa.

Volunteer | Cause: Education **Nov 2018**

Nirman Goa chapter

- Providing free tuition to underprivileged students of zuari slum and helping them achieve a better future.

Referees

Prof. Arpita Sinha

*Professor, Department of
Systems & control Engineering*
Indian Institute of Technology, Bombay
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Prof. Leena Vachhani

*Professor, Department of
Systems & control Engineering*
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Prof. Pritanshu Rajan

*Assistant Professor, Department of
Mechanical Engineering*
BITS Pilani, India
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Prof. Rakesh R. Warier

*Assistant Professor, Department of
Electrical & Electronics Engineering*
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