Gole Ritesh Sunil

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B.Tech - Mechanical Engineering
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EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech. Major	Indian Institute of Technology, Guwahati	8.38 (Current)	2020-Present
Senior Secondary	Maharashtra (HSC) Board	93.69%	2020
Secondary	Maharashtra (SSC) Board	96.0%	2018

EXPERIENCE

- **Robert Bosch Centre for Cyber-Physical Systems, IISc Bangalore** *Apr. 2023 - Jul. 2023*
  Research Intern
  - Developed a **dynamic model** and **LQR** controller for balancing of wheeled biped, validated via **Gazebo** simulation.
  - Trained and simulated biped robot model with external perturbations using **RL** policy in **Mujoco** simulator.
- **IITD-AIA Foundation for Smart Manufacturing** *Jun. 2023 - Aug. 2023*
  Robotics Intern
  - Developed a **PID** based system for tracking and following Aruco marker with **UR5** Robot arm in **Gazebo**.
  - Performed trajectory planning using **MoveIt API** and motion prediction using **Kalman Filtering**.

PROJECTS

- **Yuvaan IITG Mars Rover** *Jul. 2021 - Present*
  Robotics Club, IIT Guwahati Website
  - Designed and manufactured a 5-DOF robotic manipulator with a **bevel-gear differential**-based end-effector.
  - Performed structural analysis, achieved **30% weight reduction** and optimized workspace for constraints.
  - Deployed encoder feedback-based **PID controller interfaced with ROS** for hardware subsystems of the rover.
  - Developed **YOLOv8-based arrow detection system** and **RRT-based path planner** for autonomous navigation task.
- **Autonomous Navigation of Underwater ROV for welding purposes** *Aug. 2022 - Present*
  Bachelor's Thesis Project under Dr. Satish Kumar Panda and Dr. Biranchi Panda, IIT Guwahati Website
  - Developed **YOLOv8-based pipeline tracking system** and **PCA-based vectorization** for pose estimation.
  - Simulated ROV in **UUV Simulator via Gazebo** and tested PID controller for alignment of ROV with the pipeline.
  - Engaged in the integration of software and hardware through physical testing on the **BlueROV2**.

TECHNICAL SKILLS

- **Programming**: Python, C/C++*, MATLAB.
- **CAD and Analysis**: SolidWorks, Fusion 360, ANSYS.
- **Tools**/**Frameworks**: ROS and Gazebo, MoveIt, CoppeliaSim, OpenCV, Simulink.
- **Miscellaneous**: Jetson, Raspberry Pi, Arduino, Electronics Sensors usage, 3D printing ** Elementary proficiency*

KEY COURSES TAKEN

- **Mathematics**: Linear Algebra, Basic Calculus
- **Mechanical**: Kinematics and Dynamics of Machinery, Design of Machine Elements, Control Systems
- **Robotics and AI**: Mechatronics, Robotic Vision and Control, Fundamentals of AI
- **MOOCs**: Machine Learning, Neural Networks and Deep Learning, Robotics: Computational Motion Planning

POSITIONS OF RESPONSIBILITY

- **Project Manager**, Robotics Club, IIT Guwahati *Apr. 2022 - Apr. 2023*
- **Manipulator Lead - Yuvaan**, Robotics Club, IIT Guwahati *Apr. 2022 - Apr. 2023*
- **Team Lead - Yuvaan**, Robotics Club, IIT Guwahati *May. 2023 - Present*

ACHIEVEMENTS

- **INSPIRE scholarship 2020**, by HSC Board, for being within the top 1 % of the Board in Class XII examinations.
- **JEE Advanced 2020**, Secured an All India Rank of 3925 amongst a total of 0.15 million candidates.
- **International Rover Challenge, 2021-22 and 2022-23**, Finalists.
- **International Rover Design Challenge, 2021-22 and 2022-23**, Ranked 11th and 7th respectively worldwide.
- **Techevince 8.0, 2022**, Secured Best Project Award in Jury and Overall Categories for Yuvaan Rover project.
- **Pi-EV, 2022**, Secured 3rd Place in Overall and Engineering Design categories as Supervisory Control Systems Head.

EXTRA-CURRICULARS

- **Techniche 2021**: Organized events like chess and case study competitions under the Competitions module.
- **Automobile Club**: Was in the core team, participated in Srijan CAD Design competition and PiEV 2022.
- **Inter-IIT Techmeet 10.0 and 11.0**: Participated in High Prep problem statements as part of the IITG contingent.
- **Sports**: Silver Medal for Water Polo in Spardha 2023, completed NSO Certification in Football.