Rakesh Kumar

☐ +91 9507599652 | @ rakeshkr.ism@gmail.com | 🔗 LinkedIn | ⌂ GitHub | 📍 Bangalore, India

EDUCATION

Indian Institute of science, Bangalore Bangalore, Karnataka
M.Tech in Mechanical Engineering; **GPA: 8.4/10** *Aug 2019 – Jun 2021*

Indian Institute of Technology (ISM), Dhanbad Bangalore, Karnataka
B.Tech in Mechanical Engineering; **GPA: 7.93/10** *July 2012 – May 2016*

College of Commerce,Arts & Science Patna, Bihar
Senior Secondary Examination; **percentage: 71.2 %** *July 2009 – May 2011*

SKILLS

Programming and Skills: Python(numpy, pytorch, pytorch lightning, jax), MATLAB, C++(Beginners), Latex, FLOWNEX 1D Solver, Solidworks, Siemens NX

Languages: Hindi (Native), English (Professional)

RELEVANT COURSEWORK

Control system Design, Dynamics and Control,Linear Algebra, Differential Equations, Structural Optimization,Foundation of Robotics, Machine Learning, Deep Neural Network, Reinforcement Learning

WORK EXPERIENCE

Ola Electric Technology Pvt. Ltd. Bangalore, Karnataka
Research Engineer I - Control Engineer *July 2021 – ongoing*

- working as Research Engineer for phase 1 design and development of Autonomous Ola Electric Car
- Major responsibilities include 0 to 1 development of autonomous driving software stack and vehicle dynamics modelling and Control
- Actively involved in execution planning for autonomous development to comply with tight deadlines at an organisation level.
- Worked with PID , Stanely, Pure Pursuit controllers for tracking.
- Constrained **iLQR** using exponetial barrier function for tracking
- Local motion planner, velocity profile generation, throttle mapping to acceleration.
- State Estimation using Kalman filter , Extended Kalman filter.
- Physics informed neural networks (PINNs) for vehicle dynamics modelling.
- Object Detection and tracking with YOLO algorithm
- Ongoing project: Higher level and local motion planner for autonomous vehicle

Ola Electric Technology Pvt. Ltd. Bangalore, Karnataka
Assistant Manger - Vehicle Engineering OLA Electric S1 Pro Scooter *July 2021 – April 2022*

- Patent worthy design of pivot axle sleeve for weight and cost reduction activity.
- Transmission Belt specification calculations and confirmed experimentally.
- Press fit-force finalization of the components.
- Bolt joint calculations for various threaded fasteners
- PLM, DVP and Control plan development.

Tutor Bro Pvt. Ltd. New Delhi, India
Subject Matter Expert Mechanical Engineering *Sept 2018 – June 2021*

- As a subject matter expert in mechanical engineering, I helped students in Mechanical Engineering problems solving and MATLAB skills.

PROJECTS

Design of control system for thermal power plant |
- Design of MPC Controller using casadi in MATLAB for the next generation super critical CO_2 power plant as M.Tech Final year Project, IISc, Bangalore

Shape Optimization of a V-bent beam electrical thermal micro actuator |
- Project to design an optimized shape of a beam for maximum displacement at a prescribed point in micro-scale at IISc, Bangalore.

Stabilization of Inverted Pendulum on a cart |
- Project to find out the control gain matrix to stabilize the pendulum in an upright position and at a particular position from the reference axis. Several control designs were used like PID controller, LQR at IISc, Bangalore.

Die-Sinking EDM |
- Investigation of effect Various Parameter of Die-Sinking EDM as B.Tech Final Year Project at IIT(ISM), Dhanbad

AWARDS & ACHIEVEMENTS

GATE 2019: All India rank 944 in GATE 2019 Mechanical engineering.

IIT(JEE) 2012: Secured All India rank 1836 (OBC).

AIEEE 2012: Secured All India rank 16183

SPE-Petro fiesta 2013 in IIT Kharagpur: Secured 2nd position in Industrial Design Problem organized by ONGC.

IDCC tournaments at IISc, Bangalore: Awarded best bowler of the IDCC tournaments

HOBBIES

Cricket, Swimming, Gym