M.A. SHASHWAT

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EDUCATION

MANIPAL INSTITUTE OF TECHNOLOGY — **Manipal, Karnataka, India**
Bachelor of Technology, Major in Mechatronics, Minor in Electric Vehicle Technology — **Expected May 2024**
Cumulative GPA: 8.4/10

SKILLS & INTERESTS

Technical: Robotics Operating System [ROS2], MATLAB, Embedded Systems and RTOS [ESP32, STM32], C, C++, Python, PyTorch.

WORK EXPERIENCE

ROBERT BOSCH CENTER FOR CYBER-PHYSICAL SYSTEMS, IISC (FOCAS LAB) — **Bangalore, Karnataka, India**
Research Intern — **Jan 2024- June 2024**

- Engaged in Autonomous Drone Systems development under Professor P Jagtap's guidance, utilizing ESP_IDF alongside Motion Capture and Micro ROS for autonomous navigation, integrated with RRT for path planning. [GitHub]
- Conducting research and development on Prescribed Performance Control Algorithm for DC Motor, based on the professor's research paper, utilizing Teensy and Arduino IDE for implementation. [GitHub] [Paper Link]
  Worked on an exhibit project focusing on ball catching with an RX-200 Serial Manipulator, leveraging OpenCV for vision processing, and integrated ROS Gazebo and RVIZ for simulation and visualization.

OLA ELECTRIC — **Bangalore, Karnataka, India**
Vehicle Engineering Intern — **June 2023- Aug 2023**

- Conducted simulations of 2W and 4W models using Gamma Technology Software to assess regenerative braking performance using supercapacitors.
- Designed a flight controller that utilizes PID control algorithms and integrates an MPU-6050 sensor and motor electronic control unit, resulting in precise drone stabilization and control.

PROJECT AND RESEARCH EXPERIENCE

MOTO MANIPAL — **Manipal, Karnataka, India**
E-Powertrain Engineer — **Nov 2020 – May 2023**

- MotoManipal is Manipal Institute of Technology's Electric Superbike team which participates in various national and international competitions.
- Designed the high and low-voltage circuits and worked on the wiring harness of an electric superbike powered by a 10kw PMSM Motor. Worked on calculating, designing, and manufacturing the lithium-ion battery pack also worked on MATLAB and Simulink for powertrain modelling and range calculations.
- Developed an interactive dashboard using Python and RaspberryPi3 and collected data from the motor controller using CAN (Controller Area Network) along with data logging system for monitoring and analysis through ESP32. [GitHub].

BATTERY- SUPERCAPACITOR HYBRID SYSTEM RESEARCH — **Manipal, Karnataka, India**
Electronics and Energy Systems — **March 2021 – Feb 2023**

- Explored methods to enhance electric vehicle range and battery life by integrating supercapacitor with battery and reviewed Adaptive Fuzzy Logic Controller for energy management.
- Delivered a presentation titled "Investigation into the Performance of Battery Supercapacitor Hybrid Storage System" at the prestigious Interdisciplinary Conference on Healthcare and Technical Research (ICHTR) International Conference in November 2021.

ACADEMIC PROJECTS

Aqua-Culture Cooler Using DS18B20 Temperature Sensor [Skills: STM32, RTOS] — **EMBEDDED SYSTEMS AND RTOS**
Line Following Robot [Skills: ROS2 Humble, Gazebo, Rviz] — **ROBOTICS OPERATING SYSTEM**
IIOT Watch with Pulse Measurement [Skills: ESP32, RTOS] — **INTERNET OF THINGS**

LEADERSHIP & ACTIVITIES

Team Leader at MotoManipal: Emerged victorious in the Electric Bike Design Challenge organized by Mechatron Motors.
Secured third place in the National Online E-Bike Design Challenge - hosted by the Fraternity of Mechanical and Automotive Engineers
Sports Captain at New Horizon Public School: Demonstrated effective leadership skills in organizing and promoting various national and state-level sports activities and events and enhancing sports and fitness within the school community.
Captain and Team Member of the Karnataka State Basketball team in the U-16 and U-19 age category tournaments.