**Hardik Madaan**Phone: +91-9818092088, +91-9971416969 • Web: <https://tachymoron.wordpress.com/>Email: [hardik.mad@gmail.com](mailto:hardik.mad@gmail.com) • LinkedIn: <https://www.linkedin.com/in/hardik-madaan/>

**Career Objective:**

I thrive on solving challenging problems in Robotics and Embedded systems cultivated through designing projects and 2 years of work experience. Object to converting ideas to physical implementation and blending it with art to deliver a product.

**Career Development and Experience:**

**CRON Systems :   
Firmware Design Lead** *- February ’17 to July ’17 - 6 months*

**Firmware Design Engineer** *- November ’16 to January ’17 - 3 months*

• Developed device drivers for ARM R4F based TI controller, followed carefully with configurable, modular and multi-layer architecture aiming for safety-critical software with re-usability and minimal interdependencies.  
• Device drivers bring-up, fixing compilation and linking errors, debugging, testing peripheral drivers, static analysis and troubleshooting various issues.  
• Configurable application level firmware architecture & development for Kavach v1 product-line and wireless communication software protocol CRONet v2 & v1 for point-to-multipoint communication with support for packet forwarding.  
• Led the system level integration of Kavach with QRT and product integration with miCRON. Successfully charted & deployed processes for rigorous testing and scaling the product.  
• Aided with product installation on India-Pakistan borders, troubleshooting hardware and software problems faced on field.  
• Managing firmware policies & creating new ones, maintaining git repositories and encourage everyone in team to follow git flow and holding sync-ups to be aware of blockers to plan & act accordingly, keeping the final goal aligned with the product vision.

**Omnipresent Robot Technologies:   
UAV Engineer** *- January ’16 to October ’16 - 9 months*

• Performed R&D on coaxial multirotors UAV for stable performance under high wind conditions, provided with payload and flight time and design constraints.  
• Tuning for multirotor’s control system and extended Kalman filter parameters to obtain good estimates for orientation and position, for getting better stability leading to better control.  
• Having core knowledge about flight controllers to integrate new peripherals to the drone, via telemetry keeping strict check on the system for any sensor malfunction and base station control in case of danger or failure.  
• Using T-Motor antigravity brushless dc motors and Pixhawk autopilot developed the coaxial octocopter which could lift upto 2.5Kgs of payload and sustain 17 minutes of flight time. Testing it repeatedly over period of two months.   
• Performed 7 weeks of industrial inspection at Reliance Petrochemical Refinery under PAN India contract.  
• Coming up with process flows and performing sensor calibrations, testing safety features in the indoor test rig and on field in air.

**Other Projects:**

• **Tunafish -**  
Using ARM core m3 microcontroller, worked with an Inertial Measurement Unit to compute orientation in 3D space using Kalman filter and Quaternions for vector rotation hence obtaining orientation with respect to different reference frames and removing gravity from accelerometer sensor data.  
• **Custom Flight controller for Quadrotor -**  
Using 8 Bit microcontroller and an IMU developed flight controller firmware for a quadrotor. Implemented control system for its stability in 3 axis and interfaced it with custom radio built from a 8-bit microcontroller, joysticks and Nordic semiconductor nRF24L01+ for its wireless control and communication.

**Skills and Expertise developed:**

• Design and management of large codebases in C.  
• Experience in development of microcontrollers and digital circuits, real-time embedded firmware and various communication protocols SPI, UART and I2C.  
• Excellent debugging, troubleshooting skills and root cause analysis, detail oriented but also adept at system-level development.• Conversant on development with RTOS and bare-metal environment.  
• Played around with variety of hardware from IR LED’s to IMUs.  
• Worked with Unmanned Aerial Vehicles, state estimation and Electro-Mechanical vehicle control systems.

**Languages, tools and devices familiar with:**

• C and OOP concepts.  
• Unix shell and basic python scripting.  
• Git for collaborative firmware development.  
• Proficient at working in Linux/Windows environment.  
• GCC, G++, makefiles, diff tools.  
• IDE’s - Code Composer Studio, Keil, Embedded workbench for ARM, GNU toolchain.  
• ARM core M3/M4 STM32 and R4F TI- Hercules.  
• Basics of OpenCV using C++.

**Education:**

•Bachelors in Technology, Guru Gobind Singh IP University, India.August 2011 to May 2015Majored in Electrical and Electronics.

**Internship:**  
Thin film transistor at Dept. of Physics and Astrophysics, Delhi University. Using pulsed laser deposition, sputtering, photolithography techniques and fabricated thin film transistor.

**Reference and Recommendations:**

Reference and recommendations available upon request.

v4.3