

Dear Innovators,

I would like to express my great interest in '**Embedded Software Engineering Internship**' position in your Innovative organization.

I am currently doing my M.S. in Mechanical Engineering at 'Michigan Technological University' and specializing on Control Systems and Automation. My vision is to pursue a career in Autonomous Vehicles and I am preparing myself for it. Out of my own interest, I am learning 'Artificial Intelligence for Robotics' from Udacity by Prof. Sebastian Thrun where I am learning Probabilistic Inference, Localization, Motion Planning, SLAM etc.

I am currently working as a "Simulation Modelling Intern" in Applied Dynamics International, Ann Arbor, Michigan. I am working on their proprietary software called 'iAircraft' which is a complete set of Simulink Library to aid in 'six degree of freedom' simulation of aircrafts. I specifically work on developing the 'Aerodynamics and Flight Controls' block which the user can use to generate the aerodynamic coefficients for their aircraft configuration. I am developing 'custom made Simulink blocks' using S-functions and adding them to the 'iAircraft' library. Also, I am simultaneously working on creating a GUI based on Python (Tkinter) for 'Digital DATCOM' which is a Fortran code generated by USAF for generating aerodynamic coefficients. This GUI provides a user-friendly environment to get the aircraft configuration from the user and convert them into the specific format required by DATCOM to generate the output. This GUI has a great plotting tool created using Matplotlib which the user can use to visualize their aircraft design and output coefficients in no time.

I worked as a Research Scholar in 'Non-Linear and Autonomous Control Systems Laboratory' under Dr. Nina Mahmoudian. I worked on a project of creating a Linux based autonomous UAV system using beagle bone black and Pixhawk which can move from point A to B on its own without any RC control over it. We set up serial communication between Beagle Bone Black and Pixhawk flight controller using UART Interface. Then Developed 'C++ firmware' to achieve 'off-board' control over the Pixhawk using Beaglebone black and access all of its sensor data using MAVlink. Using the sensor readings and GPS data, developed C++ code to achieve the required maneuvers by the hexacopter by streaming continuous data of set-points to the Pixhawk which in-turn controls the PWM signals sent to the rotors and achieve the required aerial motion.

I am sure I can contribute well to your company and if you feel the same way, feel free to e-mail me at 'mshanmug@mtu.edu' or call me at 906-370-8658. I am waiting to amaze you!

Thank you for your time and consideration.

Sincerely yours,
Mugesh.