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Dear Hiring Manager,

I am **Mugesh** currently doing my M.S. in **Mechanical Engineering** at '**Michigan Technological University**' and specializing on **Control Systems and Autonomous vehicles**. Out of my own interest, I am learning 'Artificial Intelligence for Robotics' from Udacity by Prof. Sebastian Thrun where I am learning Probabilistic Inference from sensor data, 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 created 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 have excellent programming skills with **Python** and Matlab and I have created a **full-fledged GUI** application using python which is very intuitive in getting the aircraft system definition from scratch which gave me a great understanding of how to create a system level application.

If you feel I can be a good value added to your company, 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.