

AYBERK YARANERI

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TECHNICAL COMPETENCIES

Languages: (Proficient) C++, Python, MATLAB, (Familiar) Java, LaTeX
Tools: Git, Vim, Conda, GDB, TensorFlow, Keras, OpenVino, Gazebo, Robot Operating System
Relevant Skills: Linux Command Line, Object Oriented Programming, Data Structures, Embedded Systems, PID Control, I²C, SPI, UART, PCB Design & Debugging, UAV Piloting

EXPERIENCE

Illinois Applied Research Institute

February 2019 - September 2019

Full Time Robotics Developer

- Assisted in the development of autonomous multirotor UAVs intended for a simulated reconnaissance mission utilizing convolutional neural networks for detection and tracking of ground agents.
- Conducted transfer learning on various object detection networks such as Faster R-CNN, SSD, and YOLO.
- Optimized trained neural networks using the OpenVino toolkit to run on an Intel Movidius Neural Computer Stick for accelerated on-board inference.
- Configured Raspberry Pi computers to work with the Movidius NCS and transmit observations as Mavlink messages through the Pixhawk flight controller's telemetry connection.
- Wrote code to automate data collection and labelling which expedited the training process.

LEADERSHIP AND PROJECTS

NASA Student Launch Rocketry Competition

September 2018 - Present

Chief Engineer of Payload

- Collaborating with Project Manager in leading the development of an air deployed autonomous quadrotor intended to deploy from a rocket during descent. Aircraft is tasked to execute a simulated ice sample retrieval mission.
- Working with the Navio2 platform for hard real time IO coupled with a Raspberry Pi running the open source Ardupilot flight stack for autonomous guidance navigation and control.
- Implementing computer vision algorithms in C++ to run on the Raspberry Pi which will detect and guide the UAV's descent towards the ice retrieval site.
- Applying software-in-the-loop methods using Ardupilot-SITL and Gazebo as a physics engine to thoroughly test corner cases and validate software reliability.
- Formulating a development, manufacturing, and testing schedule for software and structural components of the aircraft.

NASA Midwest High Power Rocketry Competition

September 2018 - September 2019

Avionics Sub-Team Lead

- Lead an all-freshman team in developing an avionics package tasked to collect performance data of a supersonic high powered rocket using a variety of sensors.
- Embedded a Raspberry Pi Zero as the primary flight computer which utilized I²C, SPI, and UART communication protocols to acquire data from on-board sensors.
- Assigned and oversaw the development of flight software written in Python for all sub systems.
- Successfully incorporated Git as a version control and collaboration tool which significantly enhanced the team's work flow.
- Coordinated the development and assembly of a printed circuit board allowing for a more streamlined design.
- Placed 2nd overall in competition completing five flights, two of which were supersonic.

Spaceport America Cup Rocketry Competition

September 2018 - June 2019

Avionics Team Member

- Developed an on-board flight computer to actuate external control surfaces for roll control and active drag manipulation.
- Embedded an Atmega328P microcontroller and wrote flight software implementing a closed loop PID controller.
- Designed and assembled a printed circuit board that served as the primary structural member of the flight computer.
- Assisted in the development of Wi-Fi enabled solid state switches using ESP8266 microcontrollers to wirelessly toggle power to onboard systems.

EDUCATION

University of Illinois at Urbana Champaign

Bachelor of Science in Aerospace Engineering

Minor in Computer Science

2018 - 2022

GPA : 3.43/4.00