NON-U.S. Citizen

AYBERK YARANERI

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TECHNICAL COMPETENCIES

Languages:	C/C++, Python, x86/ARM/MIPS Assembly, Verilog, MATLAB, Java, LaTeX
Tools:	Git, Vim, GDB, Crostool-NG, Conda, TensorFlow, Keras, ROS, Oscilloscope/Logic Analyzer
Relevant Skills:	Embedded Linux, RTOS, Real-Time Control, Embedded Firmware/Software, PCB Design I^2C, SPI, CAN, JTAG, Parallelism/Threading, Machine Learning, Computer Vision
Relevant Coursework:	**ECE391** Computer System Programming, **CS433** Computer System Organization, **CS233** Computer Architecture, **CS225** Data Structures, **CS357** Numerical Methods **AE353** Aerospace Control Systems, **AE199** Aerospace Computation

EXPERIENCE

Raptee Energy May 2020 - August 2020
Embedded Systems Engineering Internship

- Led a group of five interns in the early development of a vehicle-control-unit for electric motorcycles.
- Devised various homogeneous and heterogeneous system architectures and assessed performance trade-offs between designs.
- Developed a FIFO buffer data structure implementing mutual exclusion principles allowing for non-blocking parallel execution.
- Wrote driver firmware in C for the SPI, ADC, and FlexTimer peripherals of an NXP MK20DX256 microcontroller.
- Created a benchmarking tool to evaluate and compare the multi-threaded performance of hardware options.
- Configured cross-compiler toolchains for the prototype hardware and made them available to the team.

Illinois Applied Research Institute February 2019 - September 2019
Full Time Robotics Developer

- Assisted in the development of UAVs utilizing convolutional neural networks for detection and tracking of ground robots.
- Conducted transfer learning on various object detection networks such as Faster R-CNN, SSD, and YOLO.
- Optimized trained models using the OpenVino toolkit to run on an Intel Movidius NCS for accelerated on-board inference.
- Wrote code to automate data collection and labelling which expedited the training process.

LEADERSHIP AND PROJECTS

NASA Student Launch Rocketry Competition September 2019 - April 2020
Chief Engineer of Payload

- Collaborated with Project Manager in leading the development of an autonomous UAV to be deployed from a rocket in-flight.
- Employed the Navio2 platform for hard real time IO coupled with a Raspberry Pi running Ardupilot for autonomy.
- Implemented computer vision algorithms in C++ to run on the Raspberry Pi for close-quarter guidance.
- Applied software-in-the-loop methods using Gazebo as a physics engine to test corner cases and validate software reliability.

NASA Midwest High Power Rocketry Competition September 2018 - September 2019
Avionics Sub-Team Lead

- Led an all-freshman team in developing an avionics package to collect flight data of a supersonic rocket using various sensors.
- Embedded a Raspberry Pi Zero as the primary flight computer which utilized I^2C, SPI, and UART communication protocols.
- 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 2^{nd} 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 enbaled solid state switches using ESP8266 microcontrollers.

EDUCATION

University of Illinois at Urbana Champaign *2018 - 2022*
Bachelor of Science in Aerospace Engineering *Technical GPA : 3.77/4.00*
Minor in Computer Science *Overall GPA : 3.55/4.00*