ZACH LOFQUIST

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Website: https://zachlofquist.github.io/PersonalWebsite/

EDUCATION

California Polytechnic State University, San Luis Obispo — 2017 - 2022

Bachelor of Science in Computer Science and Aerospace Engineering — GPA: 3.6

Chiang Mai University, Chiang Mai Thailand — Summer 2019

Coursework: Deep Learning, Computer Vision, Operating Systems, Data Structures, Algorithm Design

Skills: TensorFlow, Object-Oriented Programming, Test Driven Development, Full Stack, OpenCV, NLTK

Languages: Python, C++, C, C#, Java, MATLAB, HTML, CSS, JavaScript, React

PROJECTS

Spacecraft Design

- Worked in a team of 70+ to design a spacecraft to meet customer solicitation. Developed spacecraft system to reach and identify interstellar objects akin to 1I/'Oumuamua and 2I/Borisov
- Operated within encounter strategy team tasked with designing the encounter phase of the mission
- Developed model for determining apparent magnitude of incoming interstellar object
- Designed and developed image processing algorithm for centroid finding on interstellar object used for ephemeris updating.
- Implemented image pre-processing, edge detection and ellipse fitting methods to accurately determine center as necessitated by optical and autonomous navigation

Faster R-CNN Object Detector

- Gathered images of frogs. Labeled images with Pascal VOC format to identify frogs within images and create labeled dataset for training neural network.
- Created a neural network via transfer learning. Used a base model of MobileNetV2 for object detection. Added trainable layers on top. Trained network to identify frogs.
- Utilized OpenCV selective search segmentation to acquire proposed bounding boxes
- Iterated through proposed bounding boxes, performing non-maximum suppression and intersection over union calculation to filter predictions, resulting in a single bounding box for each frog in the image

Autonomous Car with Integrated Sensor System

- Integrated a sensor system to determine distance between car and objects around vehicle.
- Implemented C++ software to communicate between servos, sensors, and motors. Applied a Kalman filter on the recorded sensor data to remove noise and thus accurately determine distances to external obstacles
- Used derived environment knowledge to determine speed and path of vehicle for obstacle avoidance

Genealogy Extractor from Text

- Created program to take in a name from the command line and return a genealogy
- Scraped web sources to find text. Parsed text to perform named entity recognition, filtering out sentences that do not include people
- Scanned through filtered text using regular expressions to check for relations. Added found relations to set describing the relation, i.e. father.
- Additionally used synsets and nltk part of speech tagging to iterate through the filtered text to extract familial relations and outputted a GEDCOM format family tree as well as a visual representation

EXPERIENCE

Cygnet Aerospace

- Unload and preprocess material before further refinement
- Operate CNC machine to produce parts that meet exact specifications
- Inspect components for quality and assemble manufactured components into finished products to be delivered to customers