Zach Bellay

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Education

SANTA CLARA UNIVERSITY

Master of Science, Computer Science and Engineering, June 2020   GPA: 3.37/4.0

Thesis: Applying deep learning (Generative Adversarial Networks) to video compression. Implemented using PyTorch and Keras.

Bachelor of Science, Computer Science and Engineering, June 2019   GPA: 3.26/4.0

Experience

FORD MOTOR COMPANY | PRODUCT DEVELOPMENT INTERN
Jun 2019 - Sep 2019 | Palo Alto, CA

- Compared Support Vector Machines (SVM) and Convolutional Neural Network (CNN) in traffic sign detection.
- Developed and deployed small sensor network from scratch.

ONEPOINTONE | COMPUTER VISION INTERN
Jan 2018 - Mar 2019 | San Jose, CA

- Created multi-camera IoT array to capture images of plants growing on a vertical plane.
- Developed image processing pipeline to remove lens distortion and to perform image stitching.

FORD MOTOR COMPANY | PRODUCT DEVELOPMENT INTERN
Jun 2018 - Sep 2018 | Palo Alto, CA

- Developed applications for Ford's "Arduino for cars."
- Created vehicle crash data marketplace proof of concept using Ethereum blockchain and InterPlanetary File System.

SCU ROBOTIC SYSTEMS LAB | SOFTWARE ENGINEERING INTERN
Jan 2017 - Sep 2017 | Santa Clara, CA

- Built system to control indoor vertical farming system which was used in a pitch that resulted in $1.4M seed funding.

Projects

ROBUST MOVING OBJECT DETECTION
June 2018 – May 2019

- Developed and implemented robust moving object detection using L1 principal component analysis with Python.

FINGERPRINT MATCHING
MAY 2019

- Compared SIFT, SURF, and CNN feature extraction methods for fingerprint matching on the SOCOFing fingerprint dataset.

"SELF DRIVING" FISH TANK
June 2017 – Present

- Designed omnidirectional robot with mounted fish bowl in Fusion 360 and developing drivers to capture goldfish position with OpenCV and translate into commands to drive robot.

Publications & Patents

[1] S. Bertram et al. Vertical farming systems and methods, Nov. 2018. US Patent Application 20190159415. Patent Pending.

[2] Y. Liu, Z. Bellay, P. Bradsky, G. Chandler, and B. Craig. Edge-to-fog computing for color-assisted moving object detection. In F. Ahmad, editor, Big Data: Learning, Analytics, and Applications, volume 10989, pages 9 – 17. International Society for Optics and Photonics, SPIE, 2019.

Coursework

GRADUATE
Computer Vision I, II
Digital Signal Processing
ML & DSP on FPGA
Computational Creativity
Adv. Operating Systems
Adv. Computer Architecture

UNDERGRADUATE
Data Science
Applied Machine Learning
Theory of Algorithms
Software Engineering
Computer Networks
Operating Systems
Computer Architecture
Web Infrastructure

Skills

LANGUAGES
Python • C • C++
MATLAB • JavaScript
HTML/CSS • Bash

MACHINE LEARNING & COMPUTER VISION
Keras • Scikit-learn
OpenCV • Numpy
Pandas • Jupyter
Notebook • Matplotlib
PyTorch Lightning
PyTorch • Tensorboard

BACKEND & CLOUD
Docker • Kubernetes
Helm • MongoDB MySQL
InfluxDB • AWS EC2
Gunicorn • Flask

HARDWARE
Raspberry Pi • Jetson
Nano • Teensy 3.2/3.6
Arduino Uno/Mega
Soldering

CAD
Fusion 360 • Blender • 3D Printing