

Alexander Koumis

Computer Science, M.S., May 2019
University of Southern California

me@alexander.computer
(916) 607-4420

Education

M.S. Computer Science

University of Southern California

Expected Graduation: May 2019

Specialization: Intelligent Robotics

Relevant courses: Deep Learning, Computer Vision, Machine Learning, Robotics, Artificial Intelligence, Analysis of Algorithms, Database Systems

B.S. Computer Engineering

San Jose State University

Graduated: December 2015

Relevant courses: Computer Architecture, Digital Design, Real-time Operating Systems, Compiler Design, Electronics for Embedded Hardware, Microprocessor Design, Data Structures and Algorithms

Skills and Technologies

Solid programming foundation

Strong in Python, C++, C, and Javascript. Familiar with Verilog.

Strong computer vision/machine learning prototyping background

OpenCV, Matlab, PCL, ROS, Tensorflow, Keras

Experience with various embedded/digital design platforms

Arm Cortex M3/M4 (Jetson TK1, LPC17xx), FreeRTOS, Xilinx ISE, Spartan 6 (LX45) FPGA

Work Experience

DroneDeploy, San Francisco, CA

Software Engineering Intern - Computer Vision, May 2018 - August 2018

Developed photogrammetry and machine learning-based approaches for identifying Ground Control Points in UAV imagery. Used Python, OpenCV.

USC Robotic Embedded Systems Laboratory, Los Angeles, CA

Graduate Researcher, September 2017 - Present

Areas of research include reinforcement learning and intersection of CNN's and traditional monocular SLAM. Built control interface between 6DoF Tensorflow model and Qualcomm's Flight drone platform.

Pure Storage, Mountain View, CA

Software Engineer - Tools/Automation, May 2015 - July 2017

Wrote Python automation tools and libraries for Pure's test infrastructure. Regularly interfaced with Jenkins, git, py.test. Developed a RESTful client/server for coordinating long running tests on storage arrays using Flask, SQLAlchemy, and gunicorn. Built triaging dashboard with React, Node, and PostgreSQL. Developed full-stack network topology visualizer web app with Node and D3.js.

Toyota InfoTechnology Center, Mountain View, CA

Research Intern - Intelligent Computing Division (ICD), November 2014 - May 2015

Implemented novel human detection/recognition method for use in personal robotics. Activities in domain of ML/RGB-Depth/pointcloud processing using C++ ROS, OpenCV, PCL and Matlab. Responsibilities involved dataset collection and porting research publications into code. Pointcloud datasets were gathered using both a Kinect and multi-camera setup, and used as training input for a SVM classifier.

Personal Projects

YoutubeToFacebookConverter.com, February 2018

YoutubeToFacebookConverter.com

Website enabling users to transfer thousands of their YouTube videos to a Facebook page in minutes. Uses AWS Lambda and Heroku.

LSD SLAM to PCL ROS Nodelet, September 2015

github.com/alexanderkoumis/lsd_slam_to_pcl

Developed a C++ ROS Nodelet to convert LSD SLAM messages from their proprietary format to PCL PointXYZRGB messages. This project was created alongside a modified LSD SLAM that publishes RGB pointclouds instead of grayscale, and a web-based structure from motion app.

GPGPU (CUDA) SIFT Keypoint Extractor, May 2014

github.com/alexanderkoumis/jetsonSIFT

Wrote SIFT (Scale Invariant Feature Transform) keypoint extractor using CUDA.

Publications

Alexander Koumis, James Preiss and Gaurav Sukhatme. "Estimating Metric Scale Visual Odometry from Videos using 3D Convolutional Networks". Submitted to 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2019), Mar 2019.

Developed novel 3D Convolutional architecture for performing scale-accurate monocular visual odometry.

Tiebiao Zhao, **Alexander Koumis**, Haoyu Niu, Dong Wang and YangQuan Chen. "Onion treatment inference using a low-cost hyperspectral scanner." In SPIE Asia-Pacific Remote Sensing: Vol. 10780. Multispectral, Hyperspectral, and Ultraspectral Remote Sensing Technology, Techniques and Applications VII, Oct 2018.

Used various machine learning techniques to estimate onion irrigation levels from hyperspectral scanners.