De Huo

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EDUCATION

University of Southern California *(GPA: 3.67)* **Los Angeles, CA**
M.S. in Computer Science Aug 2019 - Dec 2021
Beihang University *(GPA: 3.65)* **Beijing, China**
B.Eng. in Engineering Mechanics Sept 2015 - Jun 2019

TECHNICAL STRENGTHS

Programming Languages: C/C++, Java, JavaScript, JSX, Python, TypeScript, HTML/CSS, Unix Shell, SQL.
Tools & Libraries: ROS, PyTorch, OpenCV, Git, Docker, Ajax, AngularJS, React, React Native, Redux, MySQL, MongoDB, Hadoop, Django, Flask, scikit-learn, Pandas, SciPy, socket, Ardupilot, PX4, PCL, AWS, GCP, Microsoft Azure.

EXPERIENCES

Semio **Los Angeles, CA**
Software Engineer Intern May 2020 - Aug 2020
- Built a multi-layer ROS map with regions and waypoints visualized in Arora based on TypeScript and React.
- Tracked and visualized body part motion trajectory in decaying pattern with Dynamic-Reconfiguration in ROS.
- Processed THÖR dataset with scripts to display multiple moving persons' 3D point cloud and head orientation in real time.
- Reproduced *Bayesian Estimator* used for trajectory alignment to train a model for gesture recognition.

National Laboratory of Pattern Recognition, CASIA **Beijing, China**
Software Engineer Intern Mar 2019 - Jul 2019
- Implemented C++ inference process of neural networks and improved code efficiency by 40% through Mobile AI Engine.
- Deployed neural networks on mobile ARM platforms such as *RK3399, Raspberry Pi* and other SoCs.
- Developed a multi-thread fast video stabilization algorithm based on Kalman Filter and Gaussian Filter *(Avg FPS: 149)*.
- Contrasted multiple human face detection algorithms' performance *(Dlib, libfacedetection, Arcsoft SDK, etc.)* on ARMs.

Institute of Automation and Control, Beihang University **Beijing, China**
Research Assistant Jan 2017 - Jun 2017
- Researched on omni-directional copters to decouple the relation between multi-copters' posture and movement.
- Proposed collectively a novel flight control algorithm based on quarternion theory and 8 spatial vectors.
- Produced an indoor Octocopter with cubic carbon fiber frame and 8 aerial brushless motors capable of reverse rotation.
- Achieved highly-precise indoor localization and long-time spot hovering without floating by using Pozyx platform.

PROJECTS

Stock Search Portal -- JavaScript, Python, Flask, AWS Sept 2020
- Acquired stock information by sending requests through *XMLHttpRequest* to cloud-based python backend.
- Handled user requests by calling Tiingo Stocks API and News API and sending data back through Flask framework.

Mobile Shopping App -- JavaScript, React, React Native, Redux, HTTP Aug 2020 - Sept 2020
- Built a cross-platform shopping app consisting of navigator, cart and other modules based on React Native and Expo.
- Listened, fetched and managed application states by using Redux to maintain a unidirectional data flow.
- Handled and validated user input successfully such as requests for adding new items to the shop as admin.
- Stored all data at a Firebase database and sent HTTP requests to indirectly manipulate data through Web APIs of the server.

Software Quality Analysis and Visualization -- JavaScript, HTML, React, Docker Jan 2020 - Jun 2020
- Visualized software's quality in statistical charts based on different metrics in a Web portal through React.
- Designed several interactive modules to acquire meta information from back-end server through Ajax. ***www.squaadweb.com***

Unix Kernel --C, Unix Shell Aug 2019 - Dec 2019
- Developed pivotal parts of a Unix system kernel including processes (PCB), threads (TCB), scheduler, Virtual File System and Virtual Memory such as *fork(), mmap(), sched_switch(), open()* to manage all kinds of files and address space.
- Implemented interrupt service routine and several system calls to handle different signals, exceptions and user trap requests.
- Processed input commands in terminals and created multiple processes with multiple threads to handle different requests.

Dense Visual SLAM with Optical Flow -- C++, OpenCV, PCL, ROS Jul 2018 - Dec 2018
- Conducted research on dense stereo SLAM in dynamic surroundings with RTAB-MAP on the basis of Visual Odometry.
- Added Optical Flow to detect moving objects in frames and ruled them out when extracting feature points and mapping.
- Performed testing of real-time Octo-tree mapping and navigation algorithms in ROS on Nvidia TX2.

Temporal Segmentation of Actions in Videos -- Python, PyTorch, HMM, Clustering Jun 2018 - Sept 2018
- Researched on weakly supervised learning of video action segmentation based on HMM with a polymorphic neural network.
- Incorporated spectral clustering of feature vectors into loss function and decoded distribution model with Viterbi algorithm.

RECOGNITIONS

- Champion of *Design Competition in Program of Aerospace Design United Courses (PADUC)*
- The Second Prize of *the 28th "Feng Ru Cup" Competition of Innovation*