Allen Zeng

AI & Machine Learning Software Engineer

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Education

University of California, San Diego (UCSD) Sep 2020 – Jun 2022
Electrical and Computer Engineering, M.S. *GPA: 3.9*
- Intelligent Systems, Robotics, and Control Specialization
- MicroMBA in Technology Management and Entrepreneurism

University of California, Berkeley Aug 2014 – Dec 2017
Electrical Engineering and Computer Science, B.S.

Experience

Toyon Research Corporation Jan 2018 – Present
Senior AI/ML Software Engineer – Algorithms & Applied Research

Leadership, Project Management, and Technical Writing
- Leading teams of 2-4 engineers, ensuring on-time and on-budget task completion.
- Wrote, won, and managed 2 Small Business Innovation Research (SBIR) contracts worth $280K.
- Presented 50+ monthly technical briefings to customers, and authored interim and final project reports.

Automated Building Information Model (BIM) Generation
- Implemented a Segment Anything Model and human-in-the-loop data labeling program to label 8+ hours of video and LIDAR data, producing panoptic segmentation masks for subsequent training.
- Developed a plane detection and low-polygon modeling algorithm for real-time BIM generation from point cloud data; for sending compressed, semantically labeled 3D models over degraded radio links.
- Parsed RGB-Depth camera, LIDAR, IMU, and GPS data from ROS messages and rosbags.

Object Detection, Classification, and Labeling
- Trained object detection and classification models to find aircraft and ships in gigapixel satellite images ($\geq 30k^2$ pixel). Target objects are tagged with oriented bounding boxes.
- Created the *SatLabeler* program for efficiently annotating satellite images. Both EO and SAR images are labeled directly without tiling. Supervised a team of 4 interns to label over 200K instances.
- Defined devcontainers and maintained CI/CD processes for the labeling and inference libraries.

Satellite Image 3D Reconstruction, Semantic Segmentation, and Depth Regression
- Matured a Structure from Motion (SFM) pipeline from `MATLAB` into `C++/CUDA` that removes satellite image distortion, calculates dense point clouds, and outputs digital surface models for ML training.
- Validated data and designed CNNs for monocular semantic segmentation and depth regression.
- Implemented Guided Anisotropic Diffusion to iteratively clean and update noisy ground truth labels over several hyperepochs, leading to improvements in model generalizability.
- Established domain-specific metrics and key performance indicators, based on customer feedback, to analyze models and determine which will scale best to their needs.

WellMind Sep 2021 – Jun 2022
Cofounder – Software
- Developed WellMind, a personalized behavioral solution for mild-to-moderate depression and anxiety, founded between UCSD Neural Engineering and Translation Labs (NEATLabs) and Rady MBA students.
- 1st Overall and 1st in Social Impact at StartR Demo Day (solo pitch), out of 21 teams. 1st in Audience Choice and 2nd Most Promising Venture at Rady Lab-to-Market Incubator Final Pitch, out of 30 teams.
- Raised $10K in pre-seed from competitions and grants, not including private funding.

Skills

Libraries/Tools	`PyTorch, NumPy, Matplotlib, OpenCV, Git, Docker, ONNX, MMDetection, MMCV`
Languages	`Python, C++, C, MATLAB, Bash`
Technologies	Deep Learning, Computer Vision, Convolutional Neural Networks (CNN), Vision Transformers (ViT), Simultaneous Localization And Mapping (SLAM), Augmented & Virtual Reality