Allen J. 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
- Wrote, won, and managed 2 Small Business Innovation Research (SBIR) contracts worth $280K.
- Led teams of 2-4 engineers, ensuring on-time and on-budget task completion.
- Presented in 40+ customer technical briefings and authored 10+ project final 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.

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

Satellite Image 3D Reconstruction, Semantic Segmentation, and Depth Regression
- Established domain-specific metrics and key performance indicators, based on customer feedback, to analyze models and determine which will scale best to clients' needs.
- Matured a Structure from Motion (SFM) pipeline from `MATLAB` into `C++/CUDA` that undistorts satellite push broom images, calculates dense point clouds, and outputs digital surface models.
- 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.

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, 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