# 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 and Project Management**
 ○ Leading teams of 2–4 engineers, mentoring each in software development and research.
 ○ Wrote, won, and managed 2 Small Business Innovation Research (SBIR) contracts worth **$280k**.
 ○ Presented 50+ monthly briefings to customers, and authored interim and final technical reports.

**Object Detection, Classification, and Labeling**
 ○ Trained an Oriented-RCNN model with `PyTorch` and `MMRotate` to find aircraft and ships in gigapixel satellite images ($\geq 30k \times 30k$ px), tagging detected objects with oriented bounding boxes.
 ○ Created the *SatLabeler* program for labeling both EO and SAR satellite images without tiling.
 ○ Supervised a team of 4 interns to label over **200k objects** with polygon masks and class IDs.
 ○ Defined devcontainers and CI/CD processes for the labeling, training, and inference libraries.

**Ground Robot Mapping and Data Processing**
 ○ Developed a plane detection and low-polygon modeling algorithm for point cloud data; compressing **5.2 million points/sec into 10 MB polygon mesh** 3D models.
 ○ Parsed RGB-Depth camera, LIDAR, IMU, and GPS data from ROS messages and rosbags, using Python libraries `NumPy, SciPy, OpenCV`, and `Open3D`.
 ○ Implemented a Segment Anything Model and human-in-the-loop data labeling program to label over 8 hours of video and LIDAR data, producing panoptic segmentation masks for subsequent training.

**Semantic Segmentation, 3D Reconstruction, 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.
 ○ Automated data cleaning to curate **300GB of satellite data** for training, and designed CNNs in PyTorch for monocular semantic segmentation of buildings and height regression of terrain.
 ○ Established key metrics to analyze models and determine which will scale best to clients' 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

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|---|---|
| **Libraries/Tools** | `PyTorch, NumPy, Matplotlib, OpenCV, Open3D, Shapely, Pandas, Git, Docker` |
| **Languages** | `Python, C++, MATLAB, Bash` |
| **Technologies** | Deep Learning, Computer Vision, Convolutional Neural Networks (CNN), Transformers, Vision Transformers (ViT), Generative AI, Diffusion Models, Large Language Models (LLMs) |