Joe Lin

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Education

University of California Los Angeles 09/22-06/25
Computer Science, B.S. Major GPA: 4.0

Coursework: Deep Learning, Computer Vision, Diffusion Models, Reinforcement Learning, Computer Organization, Autonomous Rover, Operating System Principles, Graphics, Linear Algebra, Statistics, Real Analysis, Differential Equations
Societies: Upsilon Pi Epsilon (CS Honor Society), Tau Beta Pi (Engineering Honor Society)

Experience

Zhou Lab at UCLA | *Undergraduate Researcher* 04/24-Present
- Learning to Generate Diverse Pedestrian Movements from Web Videos (*submitted to NeurIPS 2024*)
  - Designed **diffusion model** components for context-aware and long-term **pedestrian motion generation**
  - Created **motion visualizations** for proposed human motion dataset constructed from outdoor web videos
  - Implemented custom **data augmentation** for model generalization and generative diversity
  - Refining scene context embedding by integrating **ground plane estimations** to produce physics-abiding motions

Statistical and Relational Artificial Intelligence Lab | *Undergraduate Researcher* 12/23-Present
- Researching methods for **latent variable distillation** with **probabilistic circuits** as a way to strengthen model priors
- Running experiments to evaluate performance gains from injecting latent variables of a **hidden markov model**

Projects

RSNA Abdominal Trauma Detection | *PyTorch, NumPy, pydicom, WandB, Tensorboard* 08/23-10/23
- Engineered **end-to-end pipeline** for organ injury detection using **ResNet** backbone
- Reduced **class imbalance** across all injury types using a **weighted random sampling** technique
- Enhanced model with a **Vision Transformer** backbone and integrated organ segmentations with **TotalSegmentator**

UCLA Automated Delivery Bot | *PyTorch, NumPy, OpenCV, ROS, Ubuntu VM* 10/22-Present
- Developed steering algorithm based on **DeepLabv3** segmentations and programmed pipeline into ROS modules
- Created script to compute estimation of ego vehicle's traversable region using **Inverse Perspective Mapping**
- Researching **YOLOv8** architecture for time and space efficient detection on edge devices

Radar-Based Object Detection for Autonomous Vehicles | *PyTorch, NumPy, OpenCV* 06/21-08/22
- UCSB Research Mentorship Program, ZadarLabs
  - Conducted performance analysis on unsupervised algorithms: **DBSCAN**, **Graph-Based DBSCAN**, and **OPTICS**
  - Researched **Region Proposal Networks** and existing architectures (**VoxelNet**, **YOLO**) to formulate model proposal
  - Implemented **PointPillars** architecture and investigated transformer-based models like **Vision Transformers**

Lynbrook High School Mobile App | *React Native, Typescript, Expo, Firebase, Django* 09/19-08/22
- Developed cross-platform app for **2000+ students** to access school news, clubs, events, and other campus resources
- Provided an automated attendance tracker for **20+ clubs**, eliminating club management inefficiencies

Service

exploretech.la | *Executive Co-Director + Content Co-Director + Member* 10/22-Present
- Led a **4-week** program for **30+ students** to explore Machine Learning, Web Development, and Game Development
- Enhanced the educational experiences of **300+ students** from underserved LA high schools with **technical workshops**

Skills

Programming Languages: C, C++, Python, Javascript, Typescript, Java, R
Machine Learning/Data Science: PyTorch, Tensorflow, Deep Learning, Computer Vision, Natural Language Processing, OpenCV, Scikit-Learn, nltk, NumPy, Matplotlib, Tensorboard, pydicom
Web Frameworks: React, React Native, Next.js, Expo, Vercel, Tailwind
Other: Git, Linux, MongoDB, Firebase, Supabase, Django, Google Cloud, ROS, RStudio, BeautifulSoup, Arduino