

Jim Solomon

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Education

University of California, Los Angeles

September 2023 - June 2025

Masters of Science in Electrical and Computer Engineering

GPA: 3.96/4.0

Advised by Professor Achuta Kadambi

University of California, Los Angeles

September 2019 - June 2023

Bachelors of Science in Electrical and Computer Engineering

GPA: 3.77/4.0

Advised by Professor Chee Wei Wong

Publications

Available at solomonjim.com

2-Factor Retrieval for Improved Human-AI Decision Making in Radiology

Jim Solomon, Laleh Jalilian, Alexander Vilesov, Meryl Mathew, Tristan Grogan, Arash Bedayat, and Achuta Kadambi

arXiv preprint arXiv:2412.00372 (2024)

Intracavity Power Compensation of an 8.2 $\mu\text{g}/\text{Hz}^{1/2}$ VRW Chip-Scale Optomechanical Accelerometer

Alexis Samoylov, Talha Yerebakan, Jaime Gonzalo Flor Flores, **Jim Solomon**, Connor Nasseraddin, Andrey Matsko, and Chee Wei Wong

Laser Science, pp. JM7A-14. Optica Publishing Group, 2023

Sub-Hertz Reciprocal Frequency Readout for Chip-Scale Optomechanical Inertial Navigation

Connor Nasseraddin, Jaime Gonzalo Flor Flores, Talha Yerebakan, **Jim Solomon**, Andrey Matsko, and Chee Wei Wong

Conference on Lasers and Electro-Optics (CLEO), pp. 1-2. IEEE, 2023

AtOMICS: A neural network-based Automated Optomechanical Intelligent Coupling System for testing and characterization of silicon photonics chiplets

Jaime Flor Flores, **Jim Solomon**, Connor Nasseraddin, Talha Yerebakan, Andrey B. Matsko, and Chee Wei Wong

Machine Learning Science and Technology (2024)

Experience

Visual Machines Group

July 2023 - June 2025

Computer Vision Researcher, *Advised by Professor Achuta Kadambi*

2-Factor Retrieval for Improved Human-AI Decision

- Designing better AI methodologies for joint AI-human diagnosis
- Created an AI-human verification method that integrates interface design and search retrieval to enhance diagnostic accuracy in chest X-ray interpretation
- Demonstrated 2-Factor Retrieval's ability to increase clinician performance, especially in situations where radiologists exhibit low confidence

Large Scale 3D Instancing

- Creating Text-to-3D models for large scale computer graphics applications
- Using Score Distillation Sampling and text conditioned image diffusion models as guidance for a 3D Gaussian Splatting optimizer
- Developed depth estimation algorithm in PyTorch to prevent blending of scene and object gaussians
- This lead to the generation of sharper and higher quality 3D scenes

Eye Tracking for Diverse Set of Eyes

- Making eye trackers that perform well on people with different eye shapes and eye conditions
- Developing a contrastive learning architecture for a more robust eye tracker in AR and VR applications
- Created data collection and experiment setup in the Unity engine using C# and Python
- Collaborating with Doctors from UCLA Ophthalmology Department

Mesoscopic Optics and Quantum Electronics Lab

July 2021 - July 2023

Undergraduate Researcher, *Advised by Professor Chee Wei Wong*

Self Coupling For Testing Silicon Photonics Chipsets

- Developed a system for the automated coupling of silicon photonics chipsets
- Trained a Mask RCNN model with a RESNET backbone on the ImageNet dataset
- Utilized Transfer learning to teach the model to detect lensed optical fibers and silicon photonics chips
- Wrote a PID control to stabilize the output of the silicon photonics system
- Culminated in the creation of a real time self coupling system

Surface Reconstruction of LiDAR Point Cloud Data

- Created an algorithm to reconstruct sparse LiDAR point cloud data into 3D meshes
- Wrote an Alpha Shapes algorithm in python to reconstruct solid meshes from the three dimensional LiDAR point cloud data
- Collected data of wide open areas like streets and indoor offices using a velodyne LiDAR sensor
- Resulted in sufficient reconstruction of large scale, wide open areas

Long-Term Stability of an 8 $\mu\text{g}/\text{Hz}^{1/2}$ Chip-Scale Optomechanical Inertial Sensor

- Created a control system to stabilize laser power read in from an optomechanical inertial sensor
- Wrote a Proportional Integral Derivative Control in LabView

- Created the Optomechanical inertial sensor setup with a Labview DAQ, an Electro Optical Modulator, lensed optical fibers, inertial sensor and lasers
- Successfully reduced the long term power drift from the set up

Existential Robotics Lab

June 2022 - September 2022

Summer Undergraduate Researcher, *Advised by Professor Nikolay Atanasov*

Loco Transformers for Four Legged Robot Design

- Simulation of a four legged robotic system
- Implemented a loco transformer to integrate a robot's proprioceptive data with its visual data, allowing a robot to navigate its environment
- Created the transformer with Pytorch and interfaced it with ROS and PyBullet

PID Control for a Car Robot

- Design of a Robotic Car
- Wrote controls in python to help a car robot navigate a predetermined path
- Utilized Pybullet to simulate the control system

University of California, Los Angeles

September 2019 - December 2019

Undergraduate Research Student, *Advised by Professor William Kaiser*

Internet Of Things Device

- Tuned a Neural Network in C++ on a SensorTile device to recognize complex motions
- The Neural Network allowed for real time inference, something crucial for IOT devices
- Future applications of this technology can be in fitness trackers and biomedical devices

Teaching Experience

University of California, Los Angeles

September 2019 - December 2019

ENGR 96C Learning Assistant

- Worked as a learning assistant in Professor William Kaiser's Engineering 96C class on Internet Of Things devices
- Assisted students with setting up their SensorTile devices
- Helped students implement their Neural Networks and complete their projects

Eisenhower High School

September 2018 - February 2021

Mathematics and Physics Tutor

- Tutored underrepresented tenth and eleventh grade high school students in Math and Physics
- Helped them with their assignments and their exam studies.

Organizations

- Director of Mentorship and Partnership of the Black Graduate Students Association

- Member of the National Society of Black Engineers
- Member of the Institute of Electrical and Electronics Engineers
- Member of the Center for Excellence in Engineering and Diversity

Awards

- UCLA Graduate Opportunity Fellowship
- UC Leadership Excellence through Advanced Degrees Fellowship
- UC San Diego STARS SRC Excellence in Research and Presentation

Skills

- *Deep Learning*: Python, PyTorch, Tensorflow, NumPy, OpenCV, SKlearn
- *Software Development*: Git, Docker, Google Cloud Provider (GCP), Linux
- *Other*: ReactJS, JavaScript, Kotlin, C++, C, SQL, PostgreSQL, MongoDB and Firebase