SELIM EMIR CAN

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EDUCATION

BS in Electrical Engineering, University of California, Los Angeles — September 2020 - June 2024
Tech-breadth: Mechanical Engineering
Cum. GPA: 3.90
Major GPA: 3.98

AWARDS/HONORS

UCLA Summer Undergraduate Research Program (SURP) Stipend (2023) — Los Angeles
UCLA Harley L. Wood Family Scholarship (2023) — Los Angeles
Dean's Honor List for superior academic achievement (2023,2022,2021) — Los Angeles
Clifton and Priscilla Smith Scholarship (2020) — New York
PTSA Scholarship (2020) — New York

RESEARCH EXPERIENCE

Visual Machines Group — October 2022 - Present
Undergraduate Research Assistant — *Los Angeles, CA*

- Working with senior graduate students, enhanced 2D compositional capabilities of diffusion model architectures via modified cross attention processing using positional encodings and adapter neural networks. Created a custom dataset by filtering Google OpenImages and the ImageNet datasets for training our model.
- Currently exploring the usage of synthetic human-eye models and eye segmentation models with neural rendering (3D Gaussian Splatting) to enhance eye tracking.
- Independently built a procedural *anatomically accurate* eye/skin-model that utilizes parameters reported in previous clinical research for synthetic eye-tracking data generation in Blender 3.6 using Python.
- Implemented model-based/learning-based eye tracking algorithms. Built a fusion-based machine learning model that incorporates scene and depth maps for gaze estimation, achieving 0.86 gaze accuracy (model based method achieved 2.00 gaze accuracy).
- Created a data synchronization library to align multiple data-streams from HTC vive virtual reality headset and PupilLabs eye-tracker. Collected eye tracking data at the UCLA Stein Eye Institute.
- Played a key role in writing a *2 million dollar* NIH grant proposal titled "Equitable and Reference-free Eye Tracking for Next-Generation Healthcare" (in review). Created multiple figures (including teaser figure), wrote multiple subsections of the grant, and cited relevant papers.
- Used adaptive filtering and signal processing to reduce the effect of motion artifact in pulse oximeter blood-oxygen saturation measurements. Designed and 3D printed a pulse-oximeter casing.

Robotics and Mechanisms Laboratory (RoMeLa) — March 2022 - October 2022
Undergraduate Research Assistant (Cooking Robot Project) — *Los Angeles, CA*

- Designed and 3D-printed a modular gas sensor shell that stores a Raspberry Pi Zero 2W and 17 gas sensors to identify chemical signatures (volatile organic compounds, temperature, humidity) humans perceive as "smells". Wrote python code to synchronize each gas sensor and show gas-levels on an LCD display.
- Fabricated 2 in 1 spatula to automate cooking and minimize arm motion in limited space via dual servo motors controlled by an Arduino UNO R3. Wrote C++ code for operation. (for more detail check out this page)

Relevant skills: CAD, 3D printing, configuring linux OS, C++, Python, setting up SSH and VNC connections, communication protocols (I2C, SPI, UART), soldering, cutting metal, using heated inserts.

PRESENTATIONS

Amazon-UCLA Science Hub Fall showcase in Luskin October 2023
Poster Title: Blending Camera and 77 GHz Radar Sensing for Equitable, Robust Plethysmography
Presented by: Selim Emir Can, Jim Solomon, Achuta Kadambi

UCLA Summer Undergraduate Research Program Poster Symposium September 2023
Poster Title: Enabling Diverse Eye Anatomy Tracking
Presented by: Selim Emir Can

UCLA Summer Programs for Undergraduate Research (SPUR) Research Showcase September 2023
Poster Title: Enabling Diverse Eye Anatomy Tracking
Presented by: Selim Emir Can

RELEVANT COURSEWORK

Computer Vision, Machine Learning, Probability & Statistics, Signals and Systems, Digital Signal Processing, Applied Numerical Computing, Data Structures and Algorithms, Computer Architecture, Photonics, Semiconductor Devices

SKILLS

Mechanical	CAD (Solidworks, Fusion 360), 3-D Printing, Finite-Element Analysis
Software	C/C++, Python (PyTorch, Tensorflow), MATLAB, UnityVR, Blender, Git, Linux OS
Electrical	PCB Design (Altium Designer, EAGLE), Soldering & Wiring, Microcontrollers (Arduino, RPi)

EXTRA-CURRICULAR ACTIVITIES

Eta Kappa Nu (HKN) - Historian (Executive Board)
Ensured all events or meetings are tracked and a historical record is reported to IEEE HKN HQ to secure funding. I provide free tutoring services, hold open office hours, and host review sessions for upper division circuits classes.
Computer Vision Seminars - Undergraduate attendee
Attended presentations on computer vision/machine learning research from guest speakers and lab members from the Visual Machines Group. Attended Grundfest Lecture series on computational imaging co-organized by UCLA and Caltech. Gained intuition on the research being presented by completing techincal quizzes prepared by Prof. Kadambi.

WORK EXPERIENCE

Corning Inc. August 2019 - October 2019
Summer Research Intern *Painted-Post, NY*

- Fused different variants of composite material (SiC, Zr, NaOH) to make new cement plug compositions. I tested the strength of composite materials (ceramic pellets) and efficiency of different types of ceramic electrodes.
- Analyzed the microstructure of cement plugs using a scanning electron microscope (SEM), and performed strength tests on ceramic castings.
- I learned about polarizers, catalytic converters and the structure of glass, properties of fiberglass and its uses (fiber optics, glassware).
- Orally presented my findings to mentors from the Materials Science R&D Department to conclude my research and received a $500 award for the best research presentation.