SAEHUI HWANG

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EDUCATION

Stanford University **Sep 2022 - Present**
PhD Student, Department of Mechanical Engineering ***Palo Alto, CA***
Knight-Hennessy Scholar, Watson Fellow

California Institute of Technology **September 2018 - June 2022**
B.S. in Electrical Engineering, GPA : 3.9/4.0 ***Pasadena, CA***
Mabel Beckman Prize in Leadership

EXPERIENCE

Stanford University - SHAPE Lab **June 2024 - Present**
Ph.D. Student ***Palo Alto, CA***

- PI: Sean Follmer
- Non-visual interaction methods for accessible graphics exploration.
- Cognitive modeling through frameworks such as POMDPs and Probabilistic Progrm Induction to design interactions and improve decisionmaking.

Busan International Film Festival - Asian Contents and Film Market **June 2024 - Present**
AI Curator, Technology Specialist ***Busan, South Korea***

- Curate the Busan Innovation Story Market where creators, producers, investors, and distributors come together to pitch, develop, and finance storytelling projects in film.
- Expand the market's scope to include new media professionals and technologists to bring insights from fields such as AR, VR, Video Game, and AI.
- Facilitate panels and discussions with industry experts to help filmmakers integrate emerging technologies into storytelling and production workflow

Seoul Nat'l University - Soft Robotics and Bionics Lab **May 2020 - Oct 2021**
Summer Undergraduate Research Fellow (SURF) ***Seoul, Korea***

- PI: Prof. Yong-Lae Park
- Developed inflatable, sensor embedded skin for quadruped robots for enhanced mobility, safety, and adaptability.
- Designed and developed a pneumatic control system for the inflatable sleeves
- Built, tested & optimized communication protocol between robot and piezoelectric sensors; I2C, SPI
- Wrote a multi-class neural net to determine the impact location from pressure sensor data.

Nuro **May 2021 - September 2021**
Robotics Intern ***Mountain View, CA***

- Led the development of an optical simulation tool for the in-house LiDAR prototype. The simulation tool is currently used throughout the team for the optimization of beam scanning pattern over various optical setups.
- Designed and built rain and fog chambers to understand LiDAR's optical behaviors and pointcloud ghosting phenomenon, led discussion with perception team to improve performance on the road.
- Built an interactive dashboard for visualizing ADC waveforms, wrote IQC testing scripts for lidar configuration setup using REST API

NASA Jet Propulsion Laboratory **May 2019 - August 2019**
Summer Undergraduate Research Fellow (SURF) ***Flintridge, CA***

- Published as sole author in Caltech Undergraduate Research Journal (CURJ)
- Developed a simulation software for the planning of exoplanet missions involving the Starshade, shared with WFIRST, HabEx, and Exo-S mission teams
- Simulated noise parameters and planetary variables to construct an image using Point Spread Functions (PSF)

VOLUNTEERING / TEACHING

Graduate Teaching Assistant **2023**
Introduction to Programming in the Biological Sciences, EPFL
Statistical Inference in the Biological Sciences , TU Dresden

Caltech Undergraduate Teaching Assistant **2019 - 2022**
EE/ME 7 : Introduction to Mechatronics
Ph1abc : Classical Mechanics and Electromagnetism, Ph2 : Waves, Quantum Mechanics, and Statistical Physics

Caltech Y ExComm & Board Member **2019 - 2022**
Rise Tutoring: Volunteered to tutor 6th - 12th grade public school students struggling in math and science
Organized Make-a-Difference-Day, Local Government Seminar Series, Life Skills Series, ExploreLA, Community Service and Advocacy Fair

CREATIVE PROJECTS

Executive Producer **Jun 2023 - May 2024**
Darwin200 ***South America***
- Orchestrated the production of 29 wildlife film projects in 5 countries in South America (Brazil, Uruguay, Argentina, Chile, Peru), overseeing all stages from planning to execution.
- Provided guidance and mentorship to a multinational team of young filmmakers (from 10+ countries), ensuring the delivery of impactful conservation-focused narratives.
- Managed logistical aspects of conservation projects, including fieldwork coordination and equipment procurement.

Director **2023**
Torres del Paine Legacy Fund ***Chilean Antarctica, Chile***
- Directed a 3-part film about the conservation efforts in Torres del Paine National Park
- Led all aspects of production, including conceptualization, script development, filming, editing, and post-production, ensuring the delivery of a compelling narrative.

TECHNICAL PROJECTS

Hand Gesture Recognition **May 2020**
github.com/saehuihwang/hand_gesture_recognition
- Built a photodiode array with BJT switches, and a random forest classifier to recognize hand gestures

Function Generator **May 2021**
- Produce sinusoidal, square, and triangle waveforms with a frequency range from 50Hz to 5MHz
- The user is able to choose a waveform type, specify a DC offset, amplitude gain, and frequency.
- Takes power from a standard wall outlet. Output current more than 1A

Pulse Oximeter **Nov 2021**
github.com/saehuihwang/pulse_ox
- Built an arduino-based pulse oximeter and a user-friendly browser app, made available open-source. Design is characterized by its intuitive circuit design and robust digital signal processing

Cyclic Voltammetry **Dec 2021**
github.com/saehuihwang/cyclic_voltammetry
- Built an arduino-based cyclic voltammetry instrument and a user-friendly browser app, made available open-source. A triangle wave is applied at the working electrode and current flowing between the working and counter electrode is measured.

TECHNICAL SKILLS

Unity, Python, Julia, MATLAB, Java, Assembly, SPICE, Altium, TE Webench, Labview
Analog circuit design, embedded systems design, open-source software development, web development

HONORS AND AWARDS

Clark Prize - Awarded to 2 students at Caltech for Academic Excellence and Service
Gordon McClure Memorial Prize - Best Undergraduate Writing in History
Virtualitics Hackathon - 2nd place in Bioinformatics. ***github.com/saehuihwang/virtualitics-2021***

REFERENCES

Sean Follmer
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