

Emily Huynh

2520 Channing Way, Berkeley, CA 90623 • (714) 308-3181 • emily_huynh@berkeley.edu • in/emily-h • emilyhuynh98.github.io

EDUCATION

University of California, Berkeley

Berkeley, CA

Bachelor of Science, Bioengineering; Minor, Electrical Engineering & Computer Science

Expected Grad: May 2020

Relevant Coursework: Interactive Device Design, Signals & Systems, Digital Signal Processing, Robotics, Microelectronic Devices & Circuits, Microfabrication Technology, Microelectromechanical Systems, Data Structures & Algorithms, Global Product Development, Designing for the Human Body, Instrumentation in Biology & Medicine, Organic Chemistry Laboratory

SKILLS

Languages

Proficient: Python • Java • HTML/CSS

Familiar: LaTeX • MATLAB

Tools

SolidWorks/CAD • SPICE

COMSOL • NumPy/SciPy

Technical

Circuit Analysis/Sim/Layout • Signal Processing

SMT/THT Soldering • Rapid Prototyping • Microfabrication

PROFESSIONAL EXPERIENCE

R&D Electrical Engineering Intern

May - Aug 2019

Thermo Fisher Scientific

San Jose, CA

- Designed improvements to electrometer circuit used for mass spectrometry (MS) ion detection, including (1) lowering noise floor to improve effective number of bits (ENOB) on ADC, and (2) improving electron multiplier lifetime by improving dynamic range
- Simulated improved detection circuitry, designed 4-layer circuit board, and tested the design, observing a 2x improvement performance
- Built RF coils and designed impedance matching networks to effect changes in MS performance; processed and analyzed m/z data (peak alignment, FWHM changes, etc.) using Pandas, Numpy, Matplotlib

Undergraduate Researcher

February 2018 - Present

Shuvo Roy Laboratory; University of California, San Francisco

San Francisco, CA

- Conducted comprehensive literature review to survey current acoustic methods of pulmonary diagnosis for publishing (see Publications)
- Designed CAD enclosure for acoustic blood pressure cuff to safe keep components and minimize noise during clinical data collection
- Engineered best approach to detect fractures across simulated fractures on animal model with acoustic signals (see Projects: Fractal)

Junior Research Associate

January 2017—May 2018

Dascena, Inc.

Hayward, CA

- Worked on team to publish manuscripts for predictive software using multidimensional analyses of physiologic inputs for early sepsis alerts
- Performed data collection tasks; writing/reviewing for manuscripts and NIH/NSF grants; and completed literature reviews

PROJECTS

Fractal

Ongoing

- Prototyped end-to-end low-cost Bluetooth device with actuator and sensor to diagnose bone fractures acoustically, without imaging
- Leveraging signal processing theory to create and test different signals to extract maximal time/frequency information
- Implemented signal processing methods including frequency, and time-frequency domain analysis and feature extraction on sensor data
- Co-leading IRB-approved study at UCSF providing clinical operations manual and aiding in optimal data workflow

SmoothieBot

December 2019

- Programmed Baxter research robot to see, pick, and place fruits into a blender based on a user-determined recipe
- Utilized clustering algorithm to isolate fruit point clouds, and principal component analysis (PCA)/RGB Euclidean dist. to classify fruits
- Determined optimal grip position for robot using first and second principal components to find object centroids
- Implemented inverse kinematics to pick fruit and place into blender using AR tracking tags, and forward kinematics to fix camera position

Video Transmission Over Radio

April 2019

- Utilized various video compression techniques including sparse transforms, color transformations, resampling, filtering, motion compensation, and entropy encoding to reconstruct video and maximize PICSNR after sending video to remote host via radio
- Implemented different comm. protocols to increase bitrate and minimize BER, e.g. AFSK1200/2400 modulated packets, OFDM

Leg Orientation Sensing Brace

December 2018

- Analyzed inertial measurement unit (IMU) parameters from user testing that best characterize leg movements throughout gait cycle
- Designed and milled custom board using Eagle + Othermill to solder switch and SMT (0603) LED indicators to enhance user experience
- Led team of 4 to facilitate client interactions, communicate and delegate tasks, and organize vision for final design

AWARDS AND HONORS

Regents' and Chancellor's Fellow

Big Ideas @ Berkeley 2019 Winner — Hardware for Good Category

Thermo-Fisher Scientific Scholarship

PUBLICATIONS

Rao A, **Huynh E**, Royston TJ, et al. Acoustic methods for pulmonary diagnosis. *IEEE RBME*. 2018, doi: 10.1109/RBME.2018.2874353