

Ethan Li

Pronouns: they/them

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Education

PhD in Bioengineering

Stanford University (Stanford, CA)

Started September 2018

Advised by Prof. Manu Prakash

Thesis project working title: Open-source medical devices towards global health equity: invention, development, and implementation

MS in Computer Science

Stanford University (Stanford, CA)

Graduated June 2018

Specialization in Artificial Intelligence

BS in Bioengineering

Stanford University (Stanford, CA)

Graduated June 2016

Graduated with Distinction, Tau Beta Pi

Research & Engineering Experience

PhD Student

Summer 2019 - Present

Prakash Lab, Stanford University (Stanford, CA)

Advised by Prof. Manu Prakash

- Developing ultra-low-cost hand-powered centrifuge for clinical and scientific applications in field work and low-resource settings without electricity.
- Developing low-cost rapid test using hand-powered centrifugation to detect lead adulteration in spices for on-site inspection in low-resource settings.
- Developing embedded, backend, and frontend software, and supporting design of electrical subsystems, for an open-source ventilator being designed for local manufacturing and for clinical use globally, including in resource-limited settings.
- Supporting hardware and software development and clinical validation of low-cost automated scanning microscope platform for infectious disease diagnosis.

- Supporting hardware and software development of vertical tracking microscope to study vertical migration behavior and physiology of marine plankton.
- Supported hardware and software development of low-cost punchcard programmable microfluidics platform for molecular diagnostics.

Research Assistant

Winter 2017 - Summer 2018

Riedel-Kruse Lab, Stanford University (Stanford, CA)

Advised by Prof. Ingmar H. Riedel-Kruse

- Designed and prototyped low-cost liquid handling robot for benchtop lab automation.
- Developed visual block-based programming interface to robot controller for students and programming novices.
- Worked with collaborators to transfer design to small-scale manufacturing and deployment in user studies.

Software Engineering Intern

Summer 2017

HELLA Ventures Silicon Valley (Sunnyvale, CA)

- Prototyped novel human-machine interface design for semi-autonomous vehicles.
- Conducted feasibility study for 3D reconstruction algorithms in proposed interface.
- Designed and implemented camera rig for testing of 3D reconstruction algorithms.

Research Assistant

Summer 2016 - Winter 2017

Perinatal Safety Learning Lab, Lucile Packard Children's Hospital (Stanford, CA)

Advised by Prof. Henry C. Lee

- Prototyped and tested elements of an optimal visual display and user interface to improve clinical decision-making and situational awareness of time-critical health data for manual ventilation during infant resuscitation procedures.

Software Engineering Intern

Summer 2016

TeselaGen Biotechnology (San Francisco, CA)

- Implemented core product features of cloud platform for computer-aided design & fabrication of DNA constructs.
- Built interface for automating fabrication workflows. Shipped in a release to Dow AgroSciences in Oct. 2016.

Research Assistant

Spring 2013 - Summer 2015

KC Huang Lab, Stanford University (Stanford, CA)

Advised by Prof. KC Huang

- Developed software in MATLAB for automated statistical analysis and plotting of plate reader growth curve data to support high-throughput biological experiments.
- Developed software in C++ for computational modeling of prokaryotic cell wall mechanobiology.

Awards & Honors

Sigma Xi Scientific Research Honor Society	Invited 2019
National Defense Science and Engineering Graduate (NDSEG) Fellowship	2019 - 2021
Stanford Enhancing Diversity in Graduate Education (EDGE) Fellowship	2018 - 2020
Tau Beta Pi Engineering Honor Society	2015 - Present
Stanford President's Award for Academic Excellence in the Freshman Year	2013

Manuscripts

* indicates equal contributions.

Published

Scale-free Vertical Tracking Microscopy

Deepak Krishnamurthy, Hongquan Li, Francois Benoit du Rey, Pierre Cambournac, Adam Larson, **Ethan Li**, Manu Prakash
Nature Methods, August 2020

Bacterial evolution in high osmolarity environments

Spencer Cesar*, Maya Anjur-Dietrich*, Brian Yu, **Ethan Li**, Enrique Rojas, Norma Neff, Kerwyn Casey Huang
mBio, August 2020

Preprints

Squid: Simplifying Quantitative Imaging Platform Development and Deployment

Hongquan Li, Deepak Krishnamurthy, **Ethan Li**, Pranav Vyas, Nibha Akireddy, Chew Chai, Manu Prakash
bioRxiv, January 2021

Handyfuge-LAMP: low-cost and electricity-free centrifugation for isothermal SARS-CoV-2 detection in saliva

Ethan Li*, Adam Larson*, Anesta Kothari, Manu Prakash
medRxiv, July 2020

Utah-Stanford Ventilator (Vent4US): Developing a rapidly scalable ventilator for COVID-19 patients with ARDS

Hongquan Li*, **Ethan Li***, Deepak Krishnamurthy*, Patrick Kolbay*, Beca Chacin, Soeren Hoehne, Jim Cybulski, Lara Brewer, Tomasz Petelenz, Joseph Orr, Derek Sakata, Thomas Clardy, Kai Kuck, Manu Prakash
medRxiv, April 2020

Under Preparation

Octopi: Open configurable high-throughput imaging platform for infectious disease diagnosis in the field

Hongquan Li, Hazel Soto-Montoya, Maxime Voisin, Lucas Fuentes Valenzuela, **Ethan Li**,
Manu Prakash
Manuscript in progress

Poster Presentations

Optimizing oxygen saturation monitoring to aid decision-making in simulated neonatal resuscitation

Ethan Li, Janine Bergin, Henry Lee, Janene Fuerch
Pediatric Academic Societies Meeting (Toronto, Canada)
May 8, 2018

Teaching Experience

Course Assistant

Fall 2020

BIOE 123: Biomedical System Prototyping Lab, Stanford University (Stanford, CA)

- Assisting in planning and developing materials for the next version of the course in 2021, with adjusted learning goals and an online-only format for remote lab learning.

Course Assistant

Winter 2019

BIOE 123: Biomedical System Prototyping Lab, Stanford University (Stanford, CA)

- Assisted in teaching 40 students about principles and techniques for designing, fabricating, integrating, controlling, troubleshooting, and testing electromechanical hardware systems.
- Developed software infrastructure to enable easier integration between wireless IoT microcontroller devices and web platforms for creating online remote dashboard to hardware.
- Helped develop and deploy hands-on demonstration activities to support learning of practical electronics lab skills.

Course Assistant

Winter 2018 - Spring 2018

CS 210A/B: Software Project with Corporate Partners, Stanford University (Stanford, CA)

- Mentored four student project teams on needs finding, rapid prototyping, project management, and software engineering practices.

Course Assistant

Winter 2017

BIOE 123: Biomedical System Prototyping Lab, Stanford University (Stanford, CA)

- Assisted in teaching 30 students about principles and techniques for designing, fabricating, integrating, controlling, troubleshooting, and testing electromechanical hardware systems.
- Helped students learn to document their designs, including with functional block diagrams and specification tables.

Teaching Assistant

Spring 2015

ENGR 40M: Introduction to Electrical Engineering Lab, Stanford University (Stanford, CA)

- Taught students fundamental skills in breadboard circuit prototyping, circuit debugging, and Arduino programming.

Grader

Spring 2015

BIOE 131: Ethics in Bioengineering, Stanford University (Stanford, CA)

- Graded technical briefings describing biomedical technologies.
- Provided constructive feedback to help students improve written communication skills in technical writing.