

Suyash Kumar

SOFTWARE & BIOMEDICAL ENGINEER

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Education

Duke University

Durham, NC

B.S.E, BIOMEDICAL ENGINEERING AND COMPUTER SCIENCE (DOUBLE MAJOR)

Skills

GO, PYTHON, JAVASCRIPT, JAVA, REACT, KUBERNETES, DOCKER, GRPC, POSTGRES, MYSQL, C

Work Experience

Gradient Health

Durham, NC

CHIEF TECHNOLOGY OFFICER & VICE-PRESIDENT

Present

Gradient Health is a deep-learning in healthcare company building an interoperable web-based platform for deploying computer vision research into the clinic.

- Responsible for leading technical team of 3 and for designing fault-tolerant, secure, and scalable technical infrastructure
- Implemented a fault-tolerant backend microservice ecosystem deployed using Go, gRPC, Kubernetes and Docker.
- Built plug-and-play architecture for deploying sandboxed TensorFlow models in the clinic
- Developed open source high-performance medical image parser in Go ([github](#))
- Open source autogenerated protocol buffers for the entire dicom medical imaging specifications ([medium](#), [github](#))
- Developed frontend client application using React/Redux

Uber

San Francisco, CA

SOFTWARE ENGINEER, NEW MODALITIES TEAM

June 2016 - August 2017

Uber's fast paced New Modalities team is responsible for developing products around vehicle fleets, car rentals, bike/scooter rentals, and more.

- Responsible for the design and implementation of highly scalable backend and frontend systems that millions of people use each month (working with Go, Docker, PostgreSQL, Cassandra, Javascript)
- Consents Service: Responsible for the end-to-end architecture and development of an Uber-wide system for managing legal consents. This work was presented before Uber's CTO and garnered much praise.
- Built a newly revamped onboarding funnel experience for the New Modalities team with 40% conversion lift over existing (worked across the stack in React, Javascript, and Go).
- Won the "Big Bold Bets" award from the Uber Driver Team for work spearheading the Consents service and other internal projects.
- Performance: Consistently rated above average, promoted within my first year of joining Uber

MicroElastic Ultrasound Systems

Durham, NC

CHIEF TECHNOLOGY ADVISOR

August 2017 - Now

MicroElastic has developed a patented handheld device that can measure the elasticity of tissues non-invasively using ultrasound at low cost.

- Spun out of research I performed at Duke with Dr. Mark Palmeri and Dr. Peter Hollender with a prestigious NIH STTR grant
- Developed cross-platform image capture application for the device (React, Electron, Javascript)
- Developed high-frequency analog acquisition library able to capture >1.2 MHz on cheap hardware (AM335X assembly and C)
- Develop algorithms to extract clinically useful features from collected data
- Advise on technical product direction and development

Teaching

Duke University

Durham, NC

ASSOCIATE INSTRUCTOR, DEPARTMENT OF BIOMEDICAL ENGINEERING

August 2017 - Now

- Appointed as an **Associate Instructor** in the Duke Department of Biomedical Engineering
- I co-teach a graduate-level [Medical Software Design](#) course
- Prepare and deliver lectures, hold office hours, develop instructional material, develop grading software
- Serve as chief software engineering expert on a variety of research projects including a cloud-connected colposcope to diagnose cervical cancer and a Gates Foundation funded sanitation project.

Personal Projects

Conduit

San Francisco, CA

IoT WEB SERVICE FOR CLOUD CONNECTED DEVICES

July 2016 - Now

Conduit is a full-stack web application (built using Go, PostgreSQL, and ReactJS) that allows developers to easily control and interface with cloud-connected microcontrollers using a central RESTful API from anywhere in the world.

- Featured in engineering blog [Hackaday](#)
- Conduit has been used for a variety of applications such as [home automation](#), connected medical devices, and more.

ssl-proxy

San Francisco, CA

SINGLE-COMMAND SSL REVERSE PROXY WITH AUTOGENERATED CERTIFICATES

Oct 2018

ssl-proxy is a fast, easy-to-use reverse proxy that adds encrypted TLS/SSL to any server. It autogenerates and serves SSL/TLS certificates as required in a single command (either self-signed or via LetsEncrypt). Built in Go.

- 100+ stars on Github
- Top 15 "Show HN" on YCombinator Hacker News

CloudPulse

Durham, NC

CLOUD CONNECTED PULSE PLETHYSMOGRAPH

August 2015

CloudPulse is a cloud connected pulse device and platform from scratch.

- The device acquires your pulse, pushes it to a cloud server for processing, which ultimately pushes data to a frontend web client for viewing.
- Designed and built frontend, backend, firmware, and analog electronics myself

Research Experience

POCKeT Colposcope, Dr. Nimmi Ramanujam, Dr. Mark Palmeri

San Francisco, CA

TECHNICAL SOFTWARE LEAD

January 2016 - August 2017

The device and software platform allows for ultra-low cost cervical cancer diagnosis without the need for trained medical personnel in low-resource communities.

- Led the software group on the architectural design and implementation of a HIPPA-compliant cloud-based diagnosis platform and desktop client as the Technical Software Lead (TL).
- Built high-performance cross-platform desktop application to replace initial Matlab application. The new app is currently being tested in Duke Hospital.
- Participating in FDA 510k application development and submission

Anaerobic Pasteurization and Digestion Latrine, Dr. Mark Palmeri, Aaron Stokes

Durham, NC

SOFTWARE ENGINEER

2016

Self-contained developing world sanitation system that digests waste into biogas which is used to sanitize the waste and provide heat. Currently deployed in India, Kenya, and the Philippines.

- Funded by the **Gates Foundation**
- Developed a robust cloud platform that utilizes low-power cellular networks to relay key metrics and alerts to a central server.
- Built text interface capabilities so text messages can be used to fetch relevant data from the server in the field.

Low-Cost Ultrasonic Elasticity Device, Dr. Mark Palmeri & Dr. Kathy Nightingale

Durham, NC

RESEARCHER

September 2015-May 2016

Honors & Awards

RESEARCH

2014	Awardee , HHMI's Janelia Undergraduate Scholar Research Fellowship	Ashburn, VA
2014	Awardee , SNCURCS Barthalmus Research Grant	Charlotte, NC
2013	Awardee , SMIF Undergraduate Research Grant by the Lord Foundation and Donald Alstadt Funds	Durham, NC

Publications

Kao, D., Lai, A. G., Stamataki, E., Rosic, S., Konstantinides, N., ... Kumar, S., ... Aboobaker, A. (2016). The genome of the crustacean *Parhyale hawaiiensis*, a model for animal development, regeneration, immunity and lignocellulose digestion, 1–45. <https://doi.org/10.7554/eLife.20062>