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, 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 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 a centralized 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, Electon, 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

ssl-proxy *San Francisco, CA*

Single-command SSL reverse proxy with autogenerated certificates *Oct 2018*

ssl-proxy is a command-line tool that adds encrypted SSL to any server in a pinch. It autogenerates SSL/TLS certificates as required in a single command. Built in Go.

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

Conduit *San Francisco, CA*

Open-Source web service for cloud-connected hardware *July 2016 - Now*

Conduit is a fullstack web application (built using Go, PostgreSQL, and ReactJS) that allows developers to quickly build cloud connected hardware that can be controlled from anywhere in the world via a RESTful API.

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

CloudPulse *Durham, NC*

Cloud Connected Pulse Plethysmograph *August 2015*

CloudPluse is a cloud connected pulse plethysmograph device and platform from scratch.

- Designed and built frontend, backend, firmware, and analog electronics myself
- Device acquires and isolates your pulse pressure waveform from your finger, sends it to a server over WiFi, which pushes it to a frontend web client for viewing

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
- Devloped a robust cloud platform for a developing-world sanitation system that utilized 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 hawaiensis, a model for animal development, regeneration, immunity and lignocellulose digestion, 1–45. https://doi.org/10.7554/eLife.20062