# Samvit Jain

*Curriculum Vitae*

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## Research Interests

Large-scale machine learning, video analytics, efficient inference, computer vision.

## Education

2017 - 2019 **University of California, Berkeley**, M.S. Computer Science.
Fully funded, research Master's program in machine learning and computer systems. GPA: 4.0 / 4.0.
- Member of RISE Lab. Advised by Prof. Joseph Gonzalez. Focus: **large-scale visual inference**.
- Courses: Deep Reinforcement Learning, Advanced Topics in Computer Systems, Computer Vision.

2013 - 2017 **Princeton University**, B.S.E. Computer Science.
Graduated *summa cum laude* (with highest honors) as a member of the Phi Beta Kappa, Tau Beta Pi, and Sigma Xi honor societies. Received Shapiro Prize for Academic Excellence.
- Notable coursework: Distributed Systems, Operating Systems, Artificial Intelligence, Statistics, Computer Architecture, Networks, Security, Functional Programming, Quantum Computing, Quantum Mechanics.

## Research Experience

June 2018 - Present **Resource-Efficient Video Analytics**, *Microsoft Research*.
Reducing compute cost in large-scale video analytics by exploiting learned cross-camera correlations.
- First-author paper in submission to VLDB 2019. Position paper accepted to HotMobile 2019.

Sep 2017 - Present **Efficient Inference on Video**, *UC Berkeley*.
Master's research. Accelerating semantic segmentation on video by exploiting video compression techniques and feature similarity across frames. Papers: block motion-based feature warping (1), corrective fusion (2).
- First-author paper (1) presented in contributed talk at ECCV 2018 IWVS in Munich, Germany.
- First-author paper (2) in submission to CVPR 2019.

2016 - 2017 **Secure Micropayments**, *Princeton University*.
Senior thesis with CS Professor Brian Kernighan. Developed security protocol and client-server infrastructure to enable paid access of HTTP endpoints, without requiring user login. Thesis.

Spring 2016 **Bitcoin Micropayments**, *Princeton University*.
Research with CS Professor Arvind Narayanan. Built and evaluated prototype implementation of a Bitcoin micropayments-based system for online content monetization. Technical report.

Spring 2015 **Bitcoin Security**, *Princeton University*.
Research with CS Professor Edward Felten. Derived and experimentally verified closed-form solution for the optimal threshold on hot wallet storage in a Bitcoin exchange.
- First-author paper accepted to WEIS 2016 (26% accept rate) and Journal of Cybersecurity (via invitation).

## Professional Experience

Summer 2018 **Microsoft Research**, *Research Intern*, Redmond, WA.
Intern on the Live Video Analytics team. Mentors: Junchen Jiang, Yuanchao Shu, G. Ananthanarayanan.
Built and evaluated ReXCam, a novel cross-camera person re-identification system. Position paper

Summer 2016 **Databricks**, *Software Engineering Intern*, San Francisco, CA.
Architected full-text search feature backend (Apache Solr) as a multi-tenant, containerized microservice in Kubernetes. Shipped system to 1000s of live online course participants.
Databricks is a Series C, Andreessen Horowitz-backed big data startup commercializing Apache Spark.

Summers 2014, 2015 **LinkMeUp**, *Founder/CEO*.
Developed video link messaging app for iOS and Android. Components: link sharing, messages and reactions, social integration, push notifications, real-time data updates, session logging and analytics.
Reached over 1500 users in 70+ countries to date. Roles: Built iOS app (~12,000 lines of code), web presence, and analytics tools. Hired and managed Android engineer. Led marketing efforts.

## Teaching Experience

Spring 2017 **COS 461: Computer Networks**, *Lab TA (Volunteer)*, Princeton University.
Assisted students in developing an HTTP proxy with DNS prefetching in Go.

## Projects

Summer 2017 Started research blog focused on advances in deep learning and data systems. Five posts to date. Reached top 15 on HackerNews and over 8,000 unique visitors.

## Academic Honors

2017 **Phi Beta Kappa** – Top 10% of students in graduating Princeton class.

2015 **Tau Beta Pi** – Early induction. Top 12.5% of Princeton engineering class.

2015 **Shapiro Prize for Academic Excellence** - Top 3.9% of students in Princeton class (2014-15).

## Major Awards

2012 **AMC 12** – Top 200 in the U.S. in national mathematics competition (60,000 participants).

2009 **National History Day Contest** – 1st place in the U.S. for Historical Paper (500,000 participants in 5 categories). Year-long research project.

## Papers

2018 **Samvit Jain**, J. Jiang, Y. Shu, G. Ananthanarayanan, J. Gonzalez. *ReXCam: Resource-Efficient, Cross-Camera Video Analytics at Enterprise Scale.* In submission to **VLDB 2019**. [arXiv]

2018 **Samvit Jain**, Xin Wang, and Joseph Gonzalez. *Accel: A Corrective Fusion Network for Efficient Semantic Segmentation on Video.* In submission to **CVPR 2019**. [arXiv]

2018 **Samvit Jain**, G. Ananthanarayanan, Junchen Jiang, Yuanchao Shu, and Joseph Gonzalez. *Scaling Video Analytics Systems to Large Camera Deployments.* To appear at **HotMobile 2019**. [arXiv]

2018 **Samvit Jain** and Joseph Gonzalez. *Fast Semantic Segmentation on Video Using Block Motion.* In **ECCV 2018 International Workshop on Video Segmentation (IWVS)**, Munich. [arXiv]

2016 **Samvit Jain**, Edward Felten, and Steven Goldfeder. *Determining an Optimal Threshold on the Online Reserves of a Bitcoin Exchange.* In **WEIS 2016**, Berkeley, CA. (26% accept rate.) [pdf]

## Skills

Languages Java, Python, Objective-C, C  Familiar: Go, Scala, OCaml, Javascript

Tools git, Linux, MongoDB, AWS, Docker, Kubernetes, Apache Spark, TensorFlow, MXNet, PyTorch