

# Neil Agarwal

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## RESEARCH INTERESTS

Networked-systems, Computer Security, Digital Privacy, Distributed Systems

## EDUCATION

**University of California, Los Angeles** *Sep 2019 - Present*  
Ph.D., Computer Science

**University of California, Berkeley** *Aug 2015 - May 2019*  
B.A., Computer Science  
Member of Upsilon Pi Epsilon, Nu Chapter – Computer Science Honor Society

**Bellarmino College Preparatory** *Aug 2011 - May 2015*

## RESEARCH EXPERIENCE

**UCLA** *Aug 2019 - Present*

Advisor: Ravi Netravali

- Building privacy-preserving video analytics systems that balance user privacy and query utility.

**NetSys Lab, UC Berkeley** *Oct 2017 – Jun 2019*

Advisor: Scott Shenker

- Demonstrated feasibility of the concept of packet state load balancing using TCP headers.
- Investigated security benefits of applying cryptography to stateless load balancing, comparing our results with state-of-the-art load balancing algorithms and systems.
- Explored new link state routing mechanism to handle failure more gracefully and reduce the number of packets lost while the routing table is being updated. The idea centers around using reliable flooding to handle packet delivery during recalculation of the routing table.

**UltraScale Systems Research Center, Los Alamos National Laboratory** *May 2018 – Aug 2018*

Advisor: Nathan DeBardeleben

- Designed health models of the lab's High Performance Computing (HPC) clusters used for nuclear simulations and weapons testing.
- Developed SaNSA, a software infrastructure that consumes data from multiple sources across the lab such as system logs, compute job reservations, and the system workload manager. It then aggregates the data using a multi-pass state extraction algorithm, and performs a panel of analytics such as anomaly detection via machine learning and state transition analysis using Markov Chains.
- Used SaNSA to perform a study of 4 open compute clusters at LANL, ingesting and analyzing over 1.1 billion lines of system logs.

**Swarm Lab, UC Berkeley** *Jan 2016 – Oct 2017*

Advisor: John Kubiawicz

- Investigated a new architecture for IoT infrastructure, raising the level of abstraction to a data-centric design focused around the distribution, preservation and protection of information.
- Designed and developed a distributed application to monitor and visualize the Global Data Plane.

## **PUBLICATIONS, PRESENTATIONS & WHITE PAPERS**

James McCauley, Neil Agarwal, Barath Raghavan, Scott Shenker. “A Simple Approach for Routing Resilience.” (In submission to CoNEXT)

Neil Agarwal, Jack Sullivan. *Differentially Private Queries in a Practical Systems Setting*. CS261 Final Project Report. December 13, 2018. [https://neilagarwal.com/cs261\\_agarwal.pdf](https://neilagarwal.com/cs261_agarwal.pdf)

Neil Agarwal, Hugh Greenberg, Sean Blanchard, and Nathan DeBardleben. “SaNSA – The Supercomputer and Node State Architecture.” *2018 IEEE/ACM 8<sup>th</sup> Workshop on Fault-Tolerance for HPC at Extreme Scale (FTXS)*. IEEE, 2018. <https://neilagarwal.com/sansa.pdf>

Neil Agarwal. *Supercomputer and Node State Architecture (SaNSA)*. Poster presented at the UltraScale Systems Research Center Student Symposium at the Los Alamos National Laboratory. August 6, 2018.

Neil Agarwal. *The Global Data Plane Visualization & Monitoring Application: A White Paper*. August 2017. [https://neilagarwal.com/gdpmva\\_agarwal.pdf](https://neilagarwal.com/gdpmva_agarwal.pdf)

Neil Agarwal. *The Global Data Plane Visualization & Monitoring Application*. Demo presented at the TerraSwarm Annual Review at UC Berkeley. October 2016.

Neil Agarwal. *Interpreters: Part Two*. Lecture for CS61A: The Structure and Interpretation of Computer Programs. July 28, 2016. [https://inst.eecs.berkeley.edu/~cs61a/su16/assets/slides/22-Interpreters\\_II\\_full.pdf](https://inst.eecs.berkeley.edu/~cs61a/su16/assets/slides/22-Interpreters_II_full.pdf)

## **WORK EXPERIENCE**

### **Sony PlayStation, San Francisco**

*May – Aug 2017*

Software Engineering Intern – PlayStation Vue

- Designed a personalized real-time televised sports recommendation system in Java using Spring, Docker, Kafka, Cassandra, and Solr.

### **UC Berkeley**

*May – Aug 2016*

Undergraduate Student Instructor – The Structure and Interpretation of Computer Programs

- Led discussion/lab sections, produced course content, assisted in writing exams, held weekly office hours.
- Guest lectured to 400+ students on interpreter design, lexical/syntactic analysis, meta-circular evaluation.

## **OPEN-SOURCE CONTRIBUTIONS**

- Python Implementation of the Hasty Pudding Cipher, a tweakable-block cipher. <https://github.com/neilsagarwal/hpc>