

Tapan Srivastava

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EDUCATION **Ph.D., Computer Science** 2020 – Present
University of Chicago

B.S. Honors, Computer Science 2016 – 2020
University of Chicago GPA: 3.90/4.0
Bachelor's Thesis Supervised by Prof. Hank Hoffmann

B.S., Mathematics 2016 – 2020
University of Chicago GPA: 3.88/4.0

RESEARCH PROJECTS **Undergraduate Research Assistant** Professor Hank Hoffmann
University of Chicago Fall 2019 - Present
PoDD is a distributed power allocation mechanism, which improves upon SLURM and other allocation software by optimizing for coupled applications. PoDD, however, utilizes a single node as a server node which coordinates distributing excess power across the distributed system. This method, although functional, presents an extremely centralized approach to software that needs to run on a distributed system. My goal in the abstract is to make PoDD truly decentralized.
More concretely, I hope to utilize gossip protocols, as initially outlined by Alan Demers in his seminal paper on the subject, to propagate information across the distributed system in a peer-to-peer manner in an effort to decentralize PoDD's dynamic power allocation mechanism.

Undergraduate Research Assistant Professor Hank Hoffmann
University of Chicago Oct 2018 - April 2019
I built a software mechanism for PoDD, a distributed power allocation system, that would ensure that any given node in a distributed cluster would never exceed a given power cap. I controlled power on a given node by modulating the frequency of the CPUs on that node. One of the major challenges I faced was convergence time as this mechanism needed to guarantee that the node would converge within one second. This boiled down to reducing the period of the control system so that as many control system iterations could occur in one second as possible. I used my understanding of the systems stack to reduce the overhead of every cycle, and I came up with creative mechanisms of averaging rather than using the last power reading so that the control loop would not overreact to general system noise. I managed to work around these obstacles with the goal of allowing PoDD's results to be replicated using both hardware and software power capping mechanisms.

Undergraduate Research Assistant Professor John Goldsmith
University of Chicago June 2017 - December 2017
I constructed the User Interface and improved basic data structures and algorithms for the Linguistica project in C++ and Qt5, which is an application that determines the morphology of a natural language without any prior knowledge.

PROFESSIONAL EXPERIENCE	<p>Software Engineering Intern Uber ATG <i>Pittsburgh, PA</i> June 2019 - September 2019</p> <ul style="list-style-type: none"> • Built backend services to create a debugging tool for the tablets onboard the self-driving vehicle. • Utilized gRPC servers and protobuf to effectively log data for playback during debugging. <p>Software Engineering Intern Uber ATG <i>Pittsburgh, PA</i> June 2018 - September 2018</p> <ul style="list-style-type: none"> • Migrated an existing service running onboard the self-driving car from using an HTTP server to using a gRPC server. • Designed, implemented, and deployed a new backend service for a feature on the self-driving car. • Implemented new service in Go and Thrift, logged via Kafka streams, and utilized a distributed task orchestrator to manage workflows in a distributed production environment. • Deployed the service into production.
HONORS AND AWARDS	<p>University of Chicago Dean's List 2017-2020</p> <p>University of Chicago Presidential Scholarship 2016</p> <p>University of Chicago University Scholarship 2016</p>
RELEVANT COURSES	<p>Computer Science: • Operating Systems • Advanced Distributed Systems • Parallel Computing • Networks • Computer Architecture • Honors Algorithms • Complexity Theory</p> <p>Mathematics: • Analysis • Abstract Algebra • Linear Algebra • Discrete Mathematics • Statistical Models and Methods</p>
TECHNICAL SKILLS	<p>Languages: C/C++, Go, Python, Bash, \LaTeX</p> <p>General: Data Structures, Algorithms, Object Oriented Programming</p>
ADDITIONAL ACTIVITIES	<ul style="list-style-type: none"> • Created iPhone app to analyze Jazz chord changes • First Chair Alto Sax, Overlake High School Jazz Band • Intramural Spades Finalist 2019