Justin Miron

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Education

Ph.D. Student, Cornell University August 2017 -
Department of Computer Science
Advisor: Prof. Rachit Agarwal

B.S., University of Illinois at Urbana-Champaign August 2013 - May 2017
Department of Computer Engineering
Thesis: "Fine-grained parallel computation in the cloud"
Advisor: Prof. Laxmikant V. Kalé

Relevant Coursework

Graduate {Computer Networks, Distributed Algorithms, Distributed Systems, Computer Networks, Programming Languages & Compilers}, Computer Architecture, Networking with Big Data, Operating System Design

Research Interests

Distributed systems, datacenter networking, and peer-to-peer systems

Research Projects

Compute-storage stack for storage-disaggregated datacenters Rachit Agarwal
Building a robust storage stack that leverages shared compute co-located caches to reduce accesses to remote storage. This requires tackling challenges across scheduling, networks, and caching. Current work involves co-designing compute and caching layers to maximize cache utility across the set of compute servers.

Secure, encrypted key-value stores Rachit Agarwal, Tom Ristenpart
Design of an encrypted key-value store secure from prevalent server-side attacks, such as leakage-abuse, through an intersection of distributed systems and encryption techniques.

Prior Research Projects

Elastic computation and adaptive load balancing for scalable parallel programming on public clouds Senior Thesis
This work aimed to reduce the impact of high latency in public clouds (in comparison to high performance clusters). This is done through two techniques: on-demand adaptive replication of parallel computation units and system support for hardware elasticity during parallel computation. This was built on top of the Charm++[1] parallel runtime.

Lowering message latency on high performance clusters Parallel Programming Lab
In communication-bound application, performance is tightly coupled with message latency. The overhead was reduced through designing a new lock-free multi-producer multi-consumer queue with memory usage linear with queue size; and work on a new rendezvous protocol for no-copy RDMA messaging.

[1] Charm++ is a object-based parallel programming language. The objects are the elements of execution and are distributed across machines.

Work Experience

Summer 2018	**Software Engineering Intern at Google, Sunnyvale, CA** Network Infrastructure Improved network bandwidth allocation on Google's inter-datacenter WAN. Techniques included machine learning and real-time control system algorithms; and algorithmic analysis of existing bandwidth allocation techniques.
Summer 2017	**Software Engineering Intern at Microsoft, Aliso Viejo, CA** Azure Data Warehouse Group Built a distributed query store prototype for more extensive monitoring and debugging of distributed queries.
December 2017 - May 2017	**Software Engineer at Charmworks Inc., Champaign, IL** Optimized a parallel runtime system, Charm++[1], for high performance computing applications. Modified shared memory parallel applications to operate in a distributed memory context.
February 2016 - May 2017	**Research Assistant at University of Illinois at Urbana-Champaign, Urbana, IL** Parallel Programming Lab Performed research under Professor Laxmikant Kale to reduce and improve communication patterns in parallel algorithms and runtime systems.
Summer 2016	**Software Engineer, Tools and Infrastructure Intern at Google, Seattle, WA** Google Compute Engine Worked with the Google Compute Engine infrastructure team to implement methods for network failure detection and debugging for the Google Compute Engine.
Summer 2015	**Software Engineering Intern at ViaSat Inc., Carlsbad, CA** Antenna Control Unit Group Expanded an antenna control unit simulator to support real-time message modification and support for new antenna types.

Relevant Teaching Experience

Jan 2017 - May 2017	**Computer Networks**, Cornell University, *Teaching Assistant*
Aug 2017 - Dec 2017	**Database Systems**, Cornell University, *Teaching Assistant*
Aug 2015 - May 2017	**Data Structures**, University of Illinois at Urbana-Champaign, *Course Assistant*

Programming Skills

Languages: C, C++, Python, Java

Familiar with various parallel computing, RPC, build, and version control systems.