Xinwen Wang

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Education

Computer Science Ph.D.	Cornell University	May 2023
Computer Science B.S.	Stony Brook University	May 2017

Graduate Research Experience & Projects

Vegvisir Blockchain
Vegvisir is a blockchain system working with intermittently connected network on IoT devices. It consists of a tamperproof log and Conflict-free data structure(CRDT). Nodes can reconcile their data structure with others' opportunistically. I designed a reconciliation algorithm using vector timestamp for fast and low-overhead reconciliation. Furthermore, I also implemented a proof-of-concept version of the system in Java on Android.

Heterogeneous Consensus
Heterogeneous Consensus (Hetcons) is a consensus algorithm based on Leslie Lamport's Byzantine Paxos. Hetcons allows different learners to specify their own quorums of acceptors, different failure assumptions, and even mixed failure models. This allows two learners to achieve a consensus as long as there is an intersection between their failure assumptions and quorums.

Optimizing Communication in Distributed Machine Learning with RDMA
To overcome the network overhead introduced by distributed training, we developed a novel asynchronous zero-copy approach by using RDMA as the underlying communication channel. We implemented a proof-of-concept prototype on top of PyTorch.

Undergraduate Research Experience & Projects

Student ***BetrFS at Stony Brook University*** **2016 – 2017**
The B^ε-tree File System, or BetrFS, is an in-kernel file system that uses B^ε trees to organize on-disk storage. I was working on testing the file system performance on Ramdisk.

Research Assistant ***ICLab at Stony Brook University*** **2015 –2016**
ICLab is a research platform to enable repeatable and representative studies of a broad class of online information controls, such as traffic differentiation, censorship and content modification. I developed a headless browser by using selenium, which is a web browser automation.

Teaching Assistant:

- CS3410 Computer System Organization and Programming (Spring 2019, Cornell)
- CS5412 Cloud Computing (Spring 2018, Cornell)
- CS2110 OOP and Data Structure (Fall 2017, Cornell)

Certificates & Extracurricular Activities

Completing Linux Kernel Internals and Development Training	2018
Stony Brook Computer Science Honor Program	2016 – 2017
Academic Achievement Award	2014 – 2015
Dean List	2014 – 2016

Publications

- "Heterogeneous Consensus." *Isaac Sheff, **Xinwen Wang**, Robbert van Renesse, Andrew C. Myers.* [In Preparation]
- "Charlotte: A Web of Composable Authenticated Distributed Data Structures." *Isaac Sheff, **Xinwen Wang**, Kushal Babel, Haobin Ni, Robbert van Renesse, Andrew C. Myers.* [In Submission]

Posters

- "An IoT-friendly Blockchain for Coordination and Accountability." *Danny Adams, Gloire Rubambiza, **Xinwen Wang**, Robbert van Renesse, and Hakim Weatherspoon.* Public Safety Broadband Stakeholder Meeting (PSCR), Chicago, IL, July 2019.