Edward Tremel

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Academic Positions

Augusta University, Augusta, GA — Aug. 2020 – Present

Assistant Professor, School of Computer and Cyber Sciences

Education

Cornell University, Ithaca, NY — Aug. 2020

Ph.D. in Computer Science

- Committee: Ken Birman, Stephen Wicker, Robert Kleinberg, David Winkler
- Dissertation: "Dependable Systems for Managing Valuable Data"

Brown University, Providence, RI — May 2013

Sc.B. in Computer Science with Honors, Magna cum Laude

- Honors Thesis: "Real-World Performance of Cryptographic Accumulators"

Publications

Ken Birman, Sagar Jha, Mae Milano, Lorenzo Rosa, Weijia Song, and Edward Tremel. "Invited Paper: Monotonicity and Opportunistically-Batched Actions in Derecho." In: Shlomi Dolev and Baruch Schieber (eds), *Stabilization, Safety, and Security of Distributed Systems*. SSS 2023. Lecture Notes in Computer Science, vol 14310. doi: 10.1007/978-3-031-44274-2_14

Edward Tremel, Sagar Jha, Weijia Song, David Chu, and Ken Birman. "Reliable, Efficient Recovery for Complex Services with Replicated Subsystems." *2020 50th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, Valencia, Spain, 2020, pp. 172-183. doi: 10.1109/DSN48063.2020.00035

Sagar Jha, Jonathan Behrens, Theo Gkountouvas, Matthew Milano, Weijia Song, Edward Tremel, Robbert Van Renesse, Sydney Zink, and Kenneth P. Birman. "Derecho: Fast State Machine Replication for Cloud Services." *ACM Trans. Comput. Syst.* 36, 2, Article 4 (April 2019), 49 pages. doi: 10.1145/3302258

Edward Tremel, Ken Birman, Robert Kleinberg, and Márk Jelasity. "Anonymous, Fault-Tolerant Distributed Queries for Smart Devices." *ACM Trans. Cyber-Phys. Syst.* 3, 2, Article 16 (October 2018), 29 pages. doi: 10.1145/3204411

Jonathan Behrens, Sagar Jha, Ken Birman, and Edward Tremel. "RDMC: A Reliable RDMA Multicast for Large Objects." *2018 48th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)*, Luxembourg City, 2018, pp. 71-82. doi: 10.1109/DSN.2018.00020

Edward Tremel, Ken Birman, Márk Jelasity, and Robert Kleinberg. "Anonymous Data Collection for the Smart Grid." In *2016 IEEE Power & Energy Society General Meeting*, Boston, MA, July 2016. doi: 10.1109/PESGM.2016.7741058

Ken Birman, Márk Jelasity, Robert Kleinberg, and Edward Tremel. "Building a Secure and Privacy-Preserving Smart Grid." *SIGOPS Operating Systems Review* 49, no. 1 (January 2015), 131-136. doi: 10.1145/2723872.2723891

Presentations and Invited Talks

"Derecho: Blindingly Fast RDMA Replication for Cloud and Edge Services." Tutorial with co-presenters Ken Birman and Matthew Milano. *27th ACM Symposium on Operating Systems Principles* (SOSP 2019). Huntsville, Canada, October 27-30, 2019.

"Building Fast and Reliable Services for 5G Networks with Derecho." *40th IEEE Sarnoff Symposium*. Newark, NJ, September 23-24, 2019.

"Cloud-Hosted Intelligent Capture of IoT Data Streams with Derecho." *4th New England Networking and Systems Day* (NENS 2017). Boston, MA, December 7, 2017.

"Anonymous, Fault-Tolerant Distributed Data Mining for Smart Devices." *4th International Conference on Computational Sustainability* (CompSust 2016). Ithaca, NY, July 6-8, 2016.

"A Private Framework for Distributed Computation." *8th Workshop on Large-Scale Distributed Systems and Middleware* (LADIS 2014). Cambridge, UK, October 23-24, 2014.

Grants and Fellowships

"NSF Engines Development Award: Advancing Cyber Security Technologies in the Central Savannah River Area (GA, SC)."

- PI: Alexander Schwarzmann
- Years: 2023-2025
- Funding Organization: National Science Foundation
- Amount: $1M

"SaTC: A Robust Framework with Rigorous Semantics and Security Guarantees for Election-Day Voter Check-in."

- PI: Alexander Schwarzmann
- Years: 2021-2024
- Funding Organization: National Science Foundation
- Amount: $500K

"Transformation Grant: Principles of Computer Programming I"

- PI: Clément Aubert
- Years: 2021-2022
- Funding Organization: Affordable Learning Georgia
- Amount: $30K

Teaching Experience

Augusta University:

Principles of Computer Programming I — Spring 2021, Fall 2021
Principles of Computer Programming II — Spring 2022, Fall 2022, Spring 2023
Operating Systems — Fall 2023
Introduction to Web Development — Fall 2020

Cornell University:

Operating Systems Practicum — Spring 2020
Operating Systems — Summer 2019
Operating Systems (Teaching Assistant) — Fall 2016, Fall 2015, Fall 2013

- Graded assignments, held office hours, and taught weekly problem-solving sessions
- Created website to provide online sign-up and waiting list for office hours

The Architecture of Large-Scale Information Systems (Teaching Assistant) — Spring 2016

- Assisted in design of homework and project assignments
- Graded assignments, held office hours, and helped create automated grading system for programming projects

Object-Oriented Programming & Data Structures (Teaching Assistant) — Spring 2014

- Worked with professors and other TAs to write new exams
- Graded assignments, held office hours, and taught weekly recitation sections introducing fundamental data structures and algorithms to new computer science students

Brown University:

2D Game Engines (Teaching Assistant, Instructor) — Summer/Fall 2012

- Created new course in summer 2012 along with 4 other undergraduate TAs
- Composed all course documents, including detailed course missive and project handouts
- Wrote and delivered two lectures, assisted other TAs with teaching and grading

Awards and Scholarships

NSF Student Travel Grant for SOSP 2019 — 2019
Cornell CS Departmental Service Award — 2019
Cornell Conference Travel Grant — 2016, 2017
3rd Heidelberg Laureate Forum, invited guest — 2015
Phi Beta Kappa member — 2011

Service and Outreach

Editorial Service:

International Conference on Distributed Computing Systems (ICDCS), reviewer 2021
Journal of Distributed Computing, reviewer 2016

University Service:

Research Computing Infrastructure Committee (Augusta University), member 2023
Faculty Search Committee (Augusta University), member 2022
Upsilon Pi Epsilon (Augusta University) faculty advisor 2021-23
Information Technology Resources Committee (Augusta University), member 2021-23
Ad-Hoc Committee on Systems Courses (Augusta University), member 2021
Picnic Czar (Cornell University) 2014-19
Ph.D. Visit Tour Guide (Cornell University) 2014-19
Systems Lunch Czar (Cornell University) 2017-19

Professional Service:

Conference on Cryptology and Network Security (CANS) Organizing Committee 2023
International Symposium on Distributed Computing (DISC) Organizing Committee 2022

Volunteer Outreach:

Splash! at Cornell, volunteer teacher 2015-19
MIT Splash!, volunteer teacher 2010-12

Other Work Experience

Microsoft Research Inc., Cambridge, UK Summer 2018
Sensors and Devices Group
Research Intern

- Continued to work on Azure Sphere project from summer 2017
- Measured power consumption of different components of production version of Azure Sphere hardware, using both software modification and hardware tools
- Provided team with detailed breakdown of hardware resource usage during different software operations

Microsoft Research Inc., Cambridge, UK Summer 2017
Sensors and Devices Group
Research Intern

- Worked with Ken Woodberry and Phil Eade on Azure Sphere project
- Helped test and measure performance of early version of Azure Sphere hardware, using both hardware and OS-level tools
- Provided team with detailed performance measurements of embedded operating system bootup under different hardware constraints