

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. 2013 – 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 Aug. 2009 – May 2013
Sc.B. in Computer Science with Honors, Magna cum Laude

- Honors Thesis: “Real-World Performance of Cryptographic Accumulators,”
advised by Roberto Tamassia

Publications

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. “RDMA: 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.

Teaching Experience

Instructor, *Cornell Computer Science Department* Spring 2020

CS 441I: Operating Systems Practicum

- Responsible for lectures, office hours, and managing TA staff for the optional practicum component of CS 4410

Instructor, *Cornell College of Engineering* Summer 2019

CS 4410: Operating Systems

- Solely responsible for teaching and grading summer course, equivalent to 1 semester
- Created lectures, assignments, and exams by combining and revising materials from previous iterations of the same course
- Gave lectures and held office hours every weekday, answered student questions on Piazza

Teaching Assistant, *Cornell Computer Science Department* Fall 2016

CS 4410: Operating Systems (Profs. Rachit Argarwal and Anne Bracy)

- Graded assignments, held office hours, and taught weekly problem-solving sessions guiding students through example exam questions
- Created website to provide online sign-up and waiting list for office hours

Teaching Assistant, *Cornell Computer Science Department* Spring 2016

CS 5300: The Architecture of Large-Scale Information Systems (Prof. Al Demers)

- Provided feedback to professor on design of homework and project assignments
- Graded assignments, held office hours, and worked with one other TA to create automated grading system for programming projects

Teaching Assistant, Cornell Computer Science Department

Fall 2015

CS 4410: Operating Systems (Prof. Anne Bracy)

- Graded assignments, held office hours, and managed team of undergraduate TAs
- Helped build and test automated grading system for a homework project

Teaching Assistant, Cornell Computer Science Department

Spring 2014

CS 2110: Object-Oriented Programming & Data Structures (Profs. David Gries and Ashutosh Saxena)

- 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

Teaching Assistant, Cornell Computer Science Department

Fall 2013

CS 4410: Operating Systems (Prof. E. Gün Sirer)

- Graded assignments, held office hours and, completed most programming projects in sync with students in order to learn correct answers and be able to provide better help

Teaching Assistant, Brown Computer Science Department

Summer – Fall 2012

CS 195N: 2D Game Engines (Prof. Andy van Dam)

- 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 Fellowships

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| • NSF Student Travel Grant for SOSP 2019 | 2019 |
| • Cornell CS Departmental Service Award | 2019 |
| • Received Cornell Conference Travel Grant multiple years | 2016, 2017 |
| • Selected to attend 3 rd Heidelberg Laureate Forum | 2015 |
| • Member of Phi Beta Kappa, inducted junior year at Brown | 2011 |
| • Erwin and Frances Aymar National Scholarship | 2010-12 |
| • Robert C. Byrd Honors Scholarship (awarded until program discontinued) | 2009-11 |
| • Brown University National Scholar award given on acceptance to Brown | 2009 |
| • National Merit Scholarship | 2009 |

Service and Outreach**Editorial Service**

- Reviewer for *Journal of Distributed Computing*, 2016

Splash! at Cornell

- Volunteer teacher in April 2015, October 2015, April 2016, November 2016, April 2017, November 2018, November 2019
- Prepared and delivered single-session classes on Web Development (HTML/CSS), Architectural Styles, and Computer Networking to local high school students

Cornell Computer Science Department

- Regular presenter at Student Brown Bag seminar
- Led campus tours on Ph.D. Visit Day
- Organized department picnic and other social events
- Regular presenter at Systems Lunch seminar

MIT Splash!

- Volunteer teacher in November 2010, 2011, 2012
- Prepared and delivered single-session classes on Dungeons & Dragons and Web Development for high school students from around New England

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

Microsoft Corp., Redmond, WA

Summer 2013

Windows Azure Division, Active Directory Fabric Team

Software Development Engineer Intern

- Designed and implemented PowerShell cmdlet to parse Active Directory schema configuration files and represent them as data objects
- Designed and implemented PowerShell cmdlet to generate AD schema configuration files based on program inputs, including validation of inputs against schema consistency rules
- Created GUI application using Windows Presentation Foundation that used both cmdlets to let developers modify AD schema configuration files without manually editing them