Tej Chajed

Curriculum Vitae

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Research Interests

I work on formal verification for systems software. In my research I develop **realistic, performant systems**, specify their intended behavior, then prove that the implementation always meet the specification. My PhD research culminated in a **verified, concurrent file system** with a proof that your data is safe if the computer suddenly reboots, and which gets good performance.

Education

2014–2022 **Ph.D. in Computer Science**, MIT, Cambridge, MA
Verifying a concurrent, crash-safe file system with sequential reasoning

2014–2017 **M.S. in Computer Science**, GPA: 4.0/4.0, MIT, Cambridge, MA
Verifying an I/O-concurrent file system

2010–2014 **B.S. in Electrical Engineering and Computer Science**, GPA: 3.97/4.0, University of Illinois, Urbana, IL

Positions

2023–*present* **Assistant professor**, University of Wisconsin-Madison

2022–2023 **Postdoctoral researcher**, at VMware Research

2014–2022 **Research assistant**, at MIT in the PDOS group
advised by Frans Kaashoek, Nickolai Zeldovich, and Joseph Tassarotti

Conference Publications

HotStorage 2024 **Shadow Filesystems: Recovering from Filesystem Runtime Errors via Robust Alternative Execution**
Jing Liu, Xiangpeng Hao, Andrea Arpaci-Dusseau, Remzi Arpaci-Dusseau, *Tej Chajed*

OSDI 2024 **Inductive Invariants That Spark Joy: Using Invariant Taxonomies to Streamline Distributed Protocol Proofs**
Tony Nuda Zhang, Travis Hance, Manos Kapritsos, *Tej Chajed*, Bryan Parno

OSDI 2024 **Anvil: Verifying Liveness of Cluster Management Controllers**
Xudong Sun, Wenjie Ma, Jiawei Tyler Gu, Zicheng Ma, *Tej Chajed*, Jon Howell, Andrea Lattuada, Oded Padon, Lalith Suresh, Adriana Szekeres, Tianyin Xu

HotOS 2024 **Beyond isolation: OS verification as a foundation for correct applications**
Matthias Brun, Reto Achermann, *Tej Chajed*, Jon Howell, Gerd Zellweger, Andrea Lattuada

VLDB 2023 **DBSP: Automatic Incremental View Maintenance for Rich Query Languages**
Mihai Budiu, *Tej Chajed*, Frank McSherry, Leonid Ryzhyk, Val Tannen

OSDI 2022 **Verifying the DaisyNFS concurrent and crash-safe file system with sequential reasoning**
Tej Chajed, Joseph Tassarotti, Mark Theng, M. Frans Kaashoek, Nickolai Zeldovich

OSDI 2021 **GoJournal: a verified, concurrent, crash-safe journaling system**
Tej Chajed, Joseph Tassarotti, Mark Theng, Ralf Jung, M. Frans Kaashoek, Nickolai Zeldovich

SOSP 2019 **Verifying concurrent, crash-safe systems with Perennial**
Tej Chajed, Joseph Tassarotti, M. Frans Kaashoek, Nickolai Zeldovich

Security 2019 **EverParse: Verified Secure Zero-Copy Parsers for Authenticated Message Formats**
Tahina Ramananandro, Antoine Delignat-Lavaud, Cédric Fournet, Nikhil Swamy, *Tej Chajed*, Nadim Kobeissi, Jonathan Protzenko

PLDI 2019 **Argosy: Verifying Layered Storage Systems with Recovery Refinement**
Tej Chajed, Joseph Tassarotti, M. Frans Kaashoek, Nickolai Zeldovich

OSDI 2018 **Verifying concurrent software using movers in CSPEC**
Tej Chajed, M. Frans Kaashoek, Butler Lampson, and Nickolai Zeldovich

OSDI 2018 **Proving confidentiality in a file system using DiskSec**
Atalay İleri, *Tej Chajed*, Adam Chlipala, M. Frans Kaashoek, Nickolai Zeldovich

SOSP 2017 **Verifying a high-performance crash-safe file system using a tree specification**
Haogang Chen, *Tej Chajed*, Alex Konradi, Stephanie Wang, Atalay İleri, Adam Chlipala, M. Frans Kaashoek, Nickolai Zeldovich

SOSP 2015 **Using Crash Hoare Logic for certifying the FSCQ file system**
Haogang Chen, Daniel Ziegler, *Tej Chajed*, Adam Chlipala, M. Frans Kaashoek, and Nickolai Zeldovich

SoCC 2013 **Natjam: design and evaluation of eviction policies for supporting priorities and deadlines in mapreduce clusters**
Brian Cho, Muntasir Rahman, *Tej Chajed*, Indranil Gupta, Cristina Abad, Nathan Roberts, Philbert Lin

Workshop Papers

CoqPL 2021 **Record Updates in Coq**
Tej Chajed

CoqPL 2020 **Verifying concurrent Go code in Coq with Goose**
Tej Chajed, Joseph Tassarotti, M. Frans Kaashoek, Nickolai Zeldovich

HotOS 2015 **Amber: Decoupling user data from web applications**
Tej Chajed, Jon Gjengset, Jelle van den Hooff, M. Frans Kaashoek, James Mickens, Robert Morris, Nickolai Zeldovich

Teaching Experiences

Fall 2023 **Instructor**, CS 839: Systems verification, UW–Madison

Fall 2020 **TA**, 6.826 (Principles of Computer Systems), MIT

Fall 2019 **TA**, 6.826 (Principles of Computer Systems), MIT

Fall 2017 **TA**, 6.826 (Principles of Computer Systems), MIT

Spring 2017 **Course development**, 6.826 (Principles of Computer Systems), MIT
During this time I designed and implemented the programming assignments for 6.826.

Mentorship

2022 Mark Theng (master's thesis)

2021 Sharon Lin, undergrad

2020 Sydney Gibson (master's thesis)

2019 Eleftherios Ioannidis (master's thesis)

2017 Alex Konradi (master's thesis)

2017 Daniel Ziegler (master's thesis)

Industry Experience

Summer 2017 **Research Intern**, Microsoft Research, Cambridge, UK
Verifying low-level parsing in F*, with Cédric Fournet

Summer 2014 **Software Engineering Intern**, Google, Zürich, Switzerland

Honors & Awards

2022 Dennis Ritchie Doctoral Dissertation Award Honorable Mention (SIGOPS)

2022 George M. Sprowls PhD Thesis Award (MIT)

2014–2019 NSF Graduate Research Fellowship

2014 Jacobs Presidential Fellowship

2010–2014 Chancellor's Scholar

Professional Service

SysDW 2024 Program Committee

PLDI 2024 Program Committee

SySDW 2023 Program Committee

CPP 2023 Program Committee

POPL 2023 Program Committee

PLDI 2022 Program Committee

POPL 2021 Organized a tutorial "Iris — A Modular Foundation for Higher-Order Concurrent Separation Logic"