

Mae Milano

Assistant Professor

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Research Interests

Programming Languages, Distributed Systems, Databases, Concurrency

Education

PhD, Computer Science, Cornell University. August 2020

Thesis: Programming Safely with Weak (and Strong) Consistency

Committee: Andrew Myers (chair), Nate Foster, Dexter Kozen

ScB, Music & Computer Science, Brown University. May 2013

Senior Prize.

Academic Appointments

Assistant Professor, Princeton University. 2024-Present

Postdoctoral Scholar, advised by Joe Hellerstein. 2020-2023

RISE Lab, UC Berkeley EECS. 2020-2021

Sutter Hill Ventures. 2021-2022

Sky Lab, UC Berkeley. 2022-2023

Publications

Journal Articles

- **Better Defunctionalization through Lambda Set Specialization.** William Brandon, Benjamin Driscoll, Frank Dai, Wilson Berkow, Mae Milano. In: Proceedings of the ACM on Programming Languages (PACMPL) Volume 7, No. PLDI (PLDI), 2023. <https://doi.org/10.1145/3591260>
- **Keep CALM and CRDT On.** Shadaj Laddad, Conor Power, Mae Milano, Alvin Cheung, Natacha Crooks, Joseph M. Hellerstein. In: Proceedings of the VLDB Endowment 16.4 (2023). <https://doi.org/10.14778/3574245.3574268>
- **Katara: synthesizing CRDTs with verified lifting.** Shadaj Laddad, Conor Power, Mae Milano, Alvin Cheung, Joseph M Hellerstein. In: Proceedings of the ACM on Programming Languages 6.OOPSLA2 (Oct. 2022). <https://doi.org/10.1145/3563336>

- **Derecho: Fast state machine replication for cloud services.** Sagar Jha, Jonathan Behrens, Theo Gkountouvas, **Mae Milano**, Weijia Song, Edward Tremel, Robbert Van Renesse, Sydney Zink, Kenneth P Birman. In: ACM Transactions on Computer Systems 36.2 (Apr. 2019). <https://doi.org/10.1145/3302258>

Peer-reviewed Conference Papers

- **A Flexible Type System for Fearless Concurrency.** **Mae Milano**, Joshua Turcotti, Andrew C Myers. In: Proceedings of the 43rd ACM SIGPLAN International Conference on Programming Language Design and Implementation (PLDI 2022). <https://doi.org/10.1145/3519939.3523443>
- **A Tour of Gallifrey, a Language for Geodistributed Programming.** **Mae Milano**, Rolph Recto, Tom Magrino, Andrew C Myers. In: 3rd Summit on Advances in Programming Languages (SNAPL), 2019. <https://doi.org/10.4230/LIPIcs.SNAPL.2019.11>
- **MixT: A language for Mixing Consistency in Geodistributed Transactions.** **Mae Milano** and Andrew C Myers. In: Proceedings of the 39th ACM SIGPLAN International Conference on Programming Language Design and Implementation (PLDI 2018). <https://doi.org/10.1145/3296979.3192375>
- **A Coalgebraic Decision Procedure for NetKAT.** Nate Foster, Dexter Kozen, **Mae Milano**, Alexandra Silva, and Laure Thompson. In: Proceedings of the 42nd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL 2015). <https://doi.org/10.1145/2676726.2677011>
- **Python: The Full Monty.** Joe Gibbs Politz, Alejandro Martinez, **Mae Milano**, Sumner Warren, Daniel Patterson, Junsong Li, Anand Chitipothu, Shriram Krishnamurthi. In: Proceedings of the 2013 ACM SIGPLAN international conference on Object oriented programming systems languages & applications (OOPSLA 2013). <https://doi.org/10.1145/2544173.2509536>

Workshops and Invited Papers

- **Monotonicity and Opportunistically-Batched Actions in Derecho.** Ken Birman, Sagar Jha, **Mae Milano**, Lorenzo Rosa, Weijia Song, Edward Tremel. In: International Symposium on Stabilizing, Safety, and Security of Distributed Systems (SSS), 2023
- **Initial Steps Toward a Compiler for Distributed Programs.** Joseph M. Hellerstein, Shadaj Laddad, **Mae Milano**, Conor Power, Mingwei Samuel. In: Proceedings of the 5th workshop on Advanced tools, programming languages, and PLatforms for Implementing and Evaluating algorithms for Distributed systems (Applied), 2023
- **New directions in cloud programming.** Alvin Cheung, Natacha Crooks, Joseph M Hellerstein, **Mae Milano**. In: The Conference on Innovative Data Systems Research (CIDR), 2021
- **Derecho's Extensible, Intelligent Object Store.** Weijia Song, **Mae Milano**, Sagar Jha, Edward Tremel, Xinzhe Yang, Ken Birman. In: AISys@SOSP, 2019.

Talks (*excluding conference talks for the above papers*)

- **Researching with, and as, an undergraduate student.** Invited Talk, The ACM SIGPLAN Symposium on Principles of Programming Languages (POPL 2024) Programming Languages Mentoring Workshop (PLMW). January 2024
- **Programming Distributed Systems.** Invited Talk, Papers We Love (PWL) track at StrangeLoop 2023. September 2023. <https://www.youtube.com/watch?v=Mc3tTRkjCvE>
 - **A New Type System for Fearless Concurrency.** Invited Talk, MIT Programming Languages Symposium, May 2023.
- **Programming Languages and Distributed Systems: Better Together.** Invited Talk, Harvey Mudd CS department Colloquium, February 2023.
- **Researching with Undergraduates: a Curricular Approach.** Invited Talk, The ACM SIGPLAN conference on Systems, Programming, Languages, and Applications: Software for Humanity (SPLASH) Doctoral Symposium, December 2022.
- **A developer-centric approach to Fearless Concurrency.** Invited Talk, Swift Language Group, Apple Software, August 2022.
- **Languages and Systems for Cloud Programming.** UCSC Distributed Systems class and group (CSEI38). University of California at Santa Cruz, November 2021
- **A Tour of Gallifrey, a Language for Geodistributed Programming.** IBM PL Day, December 2019.
- **Derecho: Blindingly Fast RDMA Replication for Cloud and Edge Services.** Tutorial, The 27th ACM Symposium on Operating Systems Principles (SOSP). October 2019
- **Presenting Gallifrey, a new Java-like language for wide-area distributed programming.** Workshop Talk, the 1st Eastern Great Lakes Programming Languages Seminar (EGLPLS). May 2019.

Awards & Honors

- Departmental Service Award, 2019-2020
- National Defense Science and Engineering (NDSEG) Fellowship, 2015
- National Science Foundation Graduate Research Fellowship (honorable mention), 2015
- Cornell University Fellowship, 2013
- Senior Prize in Computing, 2013
- Rose Rosengard Subotnik prize for excellence in writing, 2012

Industry

- **Sutter Hill Ventures: Researcher-in-Residence.** 2021. *Palo Alto, CA*
 - **Microsoft Research: Research Intern.** Summer 2017
Security Research Group – Cambridge, UK
 - **Princeton Plasma Physics Lab: Research Intern.** Periods Between 2008-2011
Scientific Visualization within Computational Plasma Physics Group (CPPG) – Princeton, NJ
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Teaching Experience

Instructor.

University of California, Berkeley – Berkeley, CA

- CS294-170: Programming the Cloud: Fall 2020
 - Co-instructor with Joe Hellerstein; evenly split duties (such as paper selection, curriculum design, class sessions, and project supervision)

Cornell University – Ithaca, NY

- CS2043: UNIX Tools and Scripting: Spring 2019.
 - Sole instructor of record; reviews available at <http://www.languagesforsyste.ms/files/milano-CS2043-evals.pdf>

Brown University – Providence, RI

- CSI95r: Compilers (In Practice): Spring 2012.
 - Developed curriculum, assignments and lectures; solo instructor

Student Supervision & Mentorship

Masters.

University of California, Berkeley – Berkeley, CA

- Mingwei Samuel: Fall 2020–Fall 2021
- Pranav Saig Gaddamadugu: Fall 2020

Undergraduate.

University of California, Berkeley – Berkeley, CA

- Joshua Turcotti: Fall 2020–Spring 2022
- William Brandon: Fall 2021–Spring 2022
- Benjamin Driscoll: Fall 2021–Spring 2022
- Frank Dai: Fall 2021–Spring 2022
- Wilson Berkow: Fall 2021–Spring 2022

Cornell University – Ithaca, NY

- Patrick LaFontaine: Fall 2019–Spring 2020.
- Danny Yang: Fall 2019–Spring 2020.
- Chris Roman: Fall 2018–Fall 2019
- Yijia Chen: Fall 2018–Spring 2018
- Sahithi Kalvakota: Fall 2018–Spring 2018
- Alex Katz: Fall 2018–Spring 2018

Service

Conference Organized

PLDI 2024 (DEI co-chair)

Workshops Organized

FARM 2023, FARM 2024, IWACO 2023

Program Committees

Program Committee

- Proceedings of the ACM on Programming Languages (POPL) 2024

External Review Committee

- Proceedings of the ACM on Programming Languages (OOPSLA) 2023

Workshops

- PaPoC 2022
- EuroDW 2021

Artifact Evaluation Committee

- OOSPLA 2023
- PLDI 2019
- POPL 2017
- SPLASH 2015

Session Chair

- Weak Memory Models, POPL 2022

Service to the Field

- Selection Committee, Computing Connections Fellowship (<https://computingconnections.org>)
- SIGPLAN-M long-term mentor (<https://www.sigplan.org/LongTermMentoring/>)

Institutional Service

Cornell University, Computer Science

- Research Night Organizer. Spring and Fall 2019
- PhD Admissions Committee Reader. 2018-2020
- Departmental volunteer coordinator (czar tsar). 2014-2016
- Programming Languages Discussion Group (PLDG) coordinator. 2014-2018
- Vice President, Computer Science Graduate Organization. Spring 2016-2017
- TA Application Coordinator. 2015-2017
- Secretary, Computer Science Graduate Organization. Summer 2015
- Fellowship Archive and Workshop Organizer. 2014-2020

Brown University, Computer Science

- Systems Operator, Programmer, and Consultant (SPOC) 2010-2013

Community Service

- Instructor, Belle Sherman Elementary School. 2014
- Expanding Your Horizons Workshop Leader. 2015, 2016, 2017, 2018, 2019