Sara McAllister

PhD Candidate, Carnegie Mellon University

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Education

Carnegie Mellon University — *Pittsburgh, PA*

PhD in Computer Science, Advisors: Nathan Beckmann and Greg Ganger — *Aug. 2019 - Present*

Harvey Mudd College — *Claremont, CA*

B.S. in Computer Science, Graduated with High Distinction — *Aug. 2015 - May 2019*

Publications

Kangaroo: Caching Billions of Tiny Objects on Flash — *SOSP 2021 (Best Paper)*

Sara McAllister, Benjamin Berg, Julian Tutuncu-Macias, Juncheng Yang, Sathya Gunasekar, Jimmy Lu, Daniel S. Berger, Nathan Beckmann, Gregory R. Ganger — *Acceptance Rate: 16%*

External-memory Dictionaries in the Affine and PDAM Models — *ACM ToPC*

Michael A. Bender, Alex Conway, Martin Farach-Colton, William Jannen, Yizheng Jiao, Rob Johnson, Eric Knorr, Sara McAllister, Nirjhar Mukherjee, Prashant Pandey, Donald E. Porter, Jun Yuan, Yang Zhan — *September 2021*

The CacheLib Caching Engine: Design and Experiences at Scale — *OSDI 2020*

Benjamin Berg, Daniel S. Berger, Sara McAllister, Isaac Grosof, Sathya Gunasekar, Jimmy Lu, Michael Uhlar, Jim Carrig, Nathan Beckmann, Mor Harchol-Balter, Gregory R. Ganger — *Acceptance Rate: 18%*

Small Refinements to DAM Can Have Big Consequences for Data-Structure Design — *SPAA 2019*

Michael A. Bender, Alexander Conway, Martin Farach-Colton, William Jannen, Yizheng Jiao, Rob Johnson, Eric Knorr, Sara McAllister, Nirjhar Mukherjee, Prashant Pandey, Donald E. Porter, Jun Yuan, Yang Zhan — *Acceptance Rate: 40%*

Talks and Posters

Kangaroo: Caching Billions of Objects on Flash — *Microsoft Research, 22 Nov 2021*

Kangaroo: Caching Billions of Objects on Flash — *CMU 18-746, 17 Nov 2021*

Kangaroo: Caching Billions of Objects on Flash — *SOSP, 27 Oct 2021*

Building a Stronger, More Just Academic Community Through Mandatory Anti-bias Learning — *UPitt Diversity Forum, 28 Jul 2021*

Kangaroo: Caching Billions of Objects on Flash — *Cache@Scale, 4 Mar 2021*

Modeling Parallelism in SSDs — *NVMW, Poster, 10 Mar 2019*

Measuring Stride Intervals using Wearable Devices for Solo and 3-legged Walking — *MSSE, Poster, 2 Jun 2017*

Honors & Awards

2021 **Best Paper Award** — *SOSP*

2021 **Graduate Fellowship,** NDSEG — *DoD*

2021 **Graduate Research Fellowship,** GRFP (declined) — *NSF*

2019 **Class of '94 Award,** Outstanding CS graduate in a combination of course work, research, and service — *Harvey Mudd*

2019 **Departmental Honors,** Computer Science Department — *Harvey Mudd*

2019 **Clinic Team Award,** Outstanding performance on a team — *Harvey Mudd*

2019 **Outstanding Undergraduate Researcher Award,** Honorable Mention — *CRA*

2019 **Best Malware,** Most creative malware during capture the flag (CTF) competition — *Yelp*

Research Experience

Graduate Research Assistant — *Carnegie Mellon University*

Nathan Beckmann and Greg Ganger — *Aug. 2019 - Present*

- Researched systems that decrease cost of providing internet services at scale
- Analyzed traces from various caching workloads to identify important commonalities between workloads
- Mentored a masters and an undergraduate student on research project

Undergraduate Research Assistant — *UNC Chapel Hill*

Don Porter — *May 2018 - Aug. 2018*

- Investigated the effects of parallelism in SSDs on data-structure design
- Engineered extended attributes on BetrFS, a write-optimized research file system
- Completed theoretical and experimental analysis of node size's effect on write-optimized dictionaries

Research Assistant — *Harvey Mudd College*

Anna Ahn — *May. 2016 - Jun. 2017*

- Led analysis of data and comparison of three-legged walking to solo walking
- Constructed and tested an analysis package for gait in Matlab from wearable device data
- Mentored both a high school student on research project

Industry Experience

Microsoft Research — *Remote*

Research Intern with Daniel Berger — *Summer 2021*

- Researched in-kernel disaggregated memory solutions

Yelp — *San Francisco, CA*

Software Engineering Intern — *Summer 2019*

- Designed and implemented a Python library to track and update MySQL users and privileges
- Planned and started gradual roll out system, fully rolled out after internship across production

Pure Storage — *Claremont, CA*

Harvey Mudd College Computer Science Clinic — *Aug. 2018 - May 2019*

- Designed and implemented consistency mechanisms on top of NFS for a two controller environment
- Provided failover protocols for both VM and controller failure
- Technical lead on team of 4 in the areas of file systems and network partitioning solutions

Facebook — *Menlo Park, CA*

Software Engineering Intern — *Summer 2017*

- Developed and tested a Python library to restart and repair development servers
- Created a React and Hack PHP user interface to receive and store user inputs

Service and Outreach

Inclusivity Initiatives — *Carnegie Mellon University*

Computer Science Department, PhD program — *July 2020 - Present*

- Spearheaded grass-roots development of inclusivity initiatives with 2 other PhD students
- Developed mandatory course about diversity, equity, and inclusivity for incoming CMU CSD PhD students
- Created report with student experiences and 8 concrete action items to improve diverse student experience within department

Faculty Search - Student Committee — *Harvey Mudd College*

Computer Science Department — *Spring 2019*

Science Bus — *Harvey Mudd College*

Volunteer and Treasurer (April 2016 - May 2017) — *Aug. 2015 - May 2018*

- Instructed 4th and 5th graders in hands-on science activities at local underserved elementary schools
- Managed about $3000 of grant money to ensure funding for supplies through entire year

STEAM:coders — *Harvey Mudd College*

Site Coordinator and Volunteer Instructor — *Summer 2016*

- Led fun activities for 25 middle-school aged students while students learned basic computer science concepts
- Helped students create Scratch projects
- Coordinated parent contact including sign-in/out, admittance into program, and make-up work reminders

Teaching Experience

2021	**15-996 Spring**, Diversity, Equity, and Inclusion in Computer Science and Society, Course Co-Creator and TA	*CMU*
2019	**CS 131 Spring**, Programming Languages, Grader and Tutor	*Harvey Mudd*
2018	**CS 105 Spring and Fall**, Introduction to Computer Systems, Grader and Tutor	*Harvey Mudd*
2017	**CS 70 Fall**, Data Structures and Programming Development, Grader and Tutor	*Harvey Mudd*
2017	**CS 60 Spring**, Principles of Computer Science, Grader and Tutor	*Harvey Mudd*
2016	**CS 5 Green Fall**, Introduction to Biology and Computer Science, Grader and Tutor	*Harvey Mudd*
2016	**CS For All**, Introdution to CS on edX, Content development and production assistant	*Harvey Mudd*