Amrita Mazumdar

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Research Interests

Neural Graphics & Video Streaming · Visual Computing Systems

Present Employment

2021-Now Research Scientist, NVIDIA Research
Researcher with interests in cloud-scale neural video and graphics streaming. Manager: David Luebke

Education

University of Washington
June 2020 *PhD in Computer Science & Engineering*
March 2017 *Masters of Computer Science & Engineering*
Advisors: Luis Ceze & Mark Oskin

Columbia University
May 2014 *Bachelor of Science in Computer Engineering*

Publications

2023 *Online Overexposed Pixels Hallucination in Videos with Adaptive Reference Frame Selection*
Y. Xing, A. Mazumdar, A. Patney, C. Liu, H. Yin, Q. Chen, J. Kautz, I. Frosio
https://arxiv.org/abs/2308.15462.

AI-Mediated 3D Video Conferencing
M. Stengel, K. Nagano, C. Liu, M. Chan, A. Trevithick, S. De Mello, J. Kim, D. Luebke, A. Mazumdar, S. Wang, M. Jaiswal
SIGGRAPH Emerging Technologies.

2021 *Vss: A storage system for video analytics*
B. Haynes, M. Daum, D. He, A. Mazumdar, M. Balazinska, A. Cheung, L. Ceze
SIGMOD 2021.

TASM: A Tile-Based Storage Manager for Video Analytics
M. Daum, B. Haynes, D. He, A. Mazumdar, M. Balazinska
ICDE 2021.

2020 *VisualWorldDB: A DBMS for the Visual World*
B. Haynes, M. Daum, A. Mazumdar, M. Balazinska, L. Ceze, A. Cheung, M. Oskin
CIDR, 2020.

2019 *Vignette: Perceptual Compression for Video Storage and Processing Systems*
A. Mazumdar, B. Haynes, M. Balazinska, L. Ceze, A. Cheung, M. Oskin
ACM Symposium on Cloud Computing (SoCC), 2019.
Best Poster Award Winner.

Visual Road: A Video Data Management Benchmark
B. Haynes, A. Mazumdar, M. Balazinska, L. Ceze, A. Cheung
SIGMOD 2019.

2018 *LightDB: A DBMS for Virtual Reality Video*
B. Haynes, A. Mazumdar, A. Alaghi, M. Balazinska, L. Ceze, A. Cheung
Proceedings of the VLDB Endowment (PVLDB) 11(10), 2018.

Application Codesign of Near-Data Processing for Similarity Search
V. T. Lee, A. Mazumdar, C. del Mundo, A. Alaghi, L. Ceze, M. Oskin
IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2018.

2017 *Exploring In-Camera Computation-Communication Tradeoffs*
A. Mazumdar, T. Moreau, S. Kim, A. Alaghi, L. Ceze, M. Oskin, and V. Sathe
IEEE International Symposium on Workload Characterization (IISWC), 2017.

A Hardware-Friendly Bilateral Solver for Real-Time Virtual Reality Video
A. Mazumdar, A. Alaghi, J. T. Barron, D. Gallup, L. Ceze, M. Oskin, and S. M. Seitz
High-Performance Graphics (HPG), 2017.

2010 *Principles and Techniques of Schlieren Imaging Systems*
A. Mazumdar
Technical Report CUCS-016-13, 2010.

Honors & Awards

2020 UW CoMotion Commercialization Fellowship
UW CoMotion STEP Award Winner
2019 UW CoMotion Innovation Gap Fund Winner
SoCC Best Poster Award, for the poster accompanying the SoCC 2019 paper
2018 NCWIT Collegiate Award Finalist
2017 UW Allen School Madrona Prize Runner-Up
2014 Google Anita Borg Memorial Fellowship
2013 CRA-W Distributed Research Experience for Undergraduates (DREU) Fellowship

Talks & Presentations

2022 *Video Scrambling: Fully discarding video contents and generating them on-the-fly*
Workshop on Video Analytics, Stanford University, Invited Talk

2021 *Learning for Better Video Processing Systems*
International Workshop on Performance Analysis of Machine Learning Systems (FastPath), at IEEE ISPASS 2021, Invited Keynote

2021 *Hardware-Software Codesign for Visual Computing Systems*
UNC Chapel Hill
Carnegie Mellon University
Boston College

San Jose State University

2020 *A Picture is Worth 1000 Bytes; Everything Else is AI*
Wild and Crazy Ideas (WACI) at ASPLOS, Conference Talk

2019 *Vignette: Perceptual Compression for Video Storage and Processing Systems*
GOMACTech, Conference Talk
ACM Symposium on Cloud Computing, Conference Talk
Asilomar Microcomputer Workshop, Invited Talk
UC Santa Cruz, Invited Talk
UW Photomedia Seminar, Invited Talk

How to throw out 95% of pixels in virtual reality, without anyone noticing!
‼Con West, Conference Talk

2018 *LightDB and Vignette: Database and Storage Systems for Virtual Reality Video*
ASPLUW Retreat, Invited Talk
Google Kirkland, Invited Talk

2017-18 *A Hardware-Friendly Bilateral Solver for Real-Time Virtual Reality Video*
SRC Techcon, Conference Talk
UW Virtual Reality Seminar, Invited Talk
ACM/Eurographics High Performance Graphics, Conference Talk
Oculus Research, Invited Talk

2016-17 *Exploring In-Camera Computation-Communication Tradeoffs*
IEEE International Symposium on Workload Characterization, Conference Talk
UW PLSE Retreat, Invited Talk
UW CSE Industrial Affiliates Annual Meeting, Invited Talk

2014 *CRA-W Panel: Applying to Computer Science Graduate Programs*
Grace Hopper Celebration of Women in Computing

Service

Review Committees

2023 Program Committee, *PACT*
Program Committee, *IISWC*
External Review Committee, *SIGGRAPH Asia*
Program Committee, *SIGCOMM Workshop on Emerging Multimedia Systems*
Program Committee, *ASSYST: ISCA Workshop on Architecture and System Support for Transformer Models*
2022 Program Committee, *IISWC*
Program Committee, *Young Architects Workshop*
External Review Committee, *MICRO*
2021 Program Committee, *EuroSys Doctoral Workshop*
Artifact Evaluation Committee, *OSDI*
Artifact Evaluation Committee, *ASPLOS*

2018 Program Committee, *ASPLOS Shadow PC*
2017 External Reviewer, *IEEE Micro*
2016 Program Committee, *Grace Hopper Celebration of Women in Computing*

Institutional Service

2023 Member, *NVIDIA Graduate Fellowship Review Committee*
2017-20 Member, *University of Washington CSE Graduate Admissions Committee*
2015-20 Moderator, *University of Washington CSE Diversity-Allies Listserv*
2015-20 Member, *University of Washington CSE Prospective Student Committee*
2016 Co-Chair, *University of Washington CSE Prospective Student Committee*
Co-Chair, *University of Washington CSE TGIF Committee*
2015 Mentor, *University of Washington CSE Graduate Mentoring*
Member, *University of Washington CSE Prospective Student Committee*

Outreach

2017-19 Chair, *University of Washington CSE Women's Research Day*
2017 Social Media Editor, *ACM SIGARCH*
2015 Co-Chair, *University of Washington CSE Women's Research Day*
2015 Mentor, *ICRA 2015*, Go, Girl Go! Forum
2014 Panelist, *Grace Hopper Celebration of Women in Computing*
2013 Vice President, *Columbia Women in Computer Science*

Student Advising

2022 Ali Jahanshahi (UC Riverside, NVIDIA Intern)
Yizhou Chen (University of Wisconsin, Madison)
2017-19 Lucas Cendes (UW CSE)
2017-19 Zachary Calipes (UW EE)
2016 Austin Archiega (UW EE)
Umaymah Khan (UW EE)
2015 Beck Pang (UW EE)
Yufang Sun (UW CSE)

Teaching

2017 Teaching Assistant, *Hardware-Software Interface (CSE 351)*, University of Washington
2016 Teaching Assistant, *Computer Architecture (CSE 548)*, University of Washington
2015 Tutor, *Hardware-Software Interface (CSE 351)*, University of Washington
Tutor, *Programming Languages (CSE 341)*, University of Washington
2014 Instructor, *Emerging Scholars Program (COMS 3998)*, Columbia University
Teaching Assistant, *Embedded Systems Design (COMS 4840)*, Columbia University
2013 Laboratory Assistant, *Introduction to Java*, Columbia Science Honors Program
2012 Teaching Assistant, *Object-Oriented Programming (COMS 1007)*, Columbia University

Previous Employment

2020-2021 Founder & CEO, Vignette AI
Founded an AI-based video compression software company.

2020-2021 CoMotion Postdoctoral Fellow, University of Washington.
Fellowship to explore the commercialization potential of my research innovations

Research Intern, Facebook Reality Lab.

2018 Design space exploration for deep neural network performance for AR/VR. Manager: Anton Kaplanyan

2017 Explored memory subsystems for AR/VR headsets. Manager: Warren Hunt

ASIC Design Intern, IBM Microelectronics.

2012 Designed and implemented test circuits for fabricated ASIC chips. Manager: Erik Hedberg