Abhishek Madan

amadan@cs.toronto.edu https://www.dgp.toronto.edu/~amadan/

Skills

C++, CUDA, OptiX, OpenGL, MATLAB, Go, Java, Python, C

Education

PhD in Computer Science, University of Toronto September 2021–Present
Supervisor: David I.W. Levin

MSc in Computer Science, University of Toronto September 2019–June 2021
Thesis: *Diffusion Structures for Architectural Stripe Pattern Generation*
Supervisor: David I.W. Levin

Bachelor of Software Engineering, University of Waterloo September 2014–April 2019
Honours Co-operative Program, with Distinction — Dean's Honours List

Work Experience

- **Research Scientist Intern at Adobe** June 2022–August 2022
  Designed and evaluated methods for auto-generating idle 3D mesh animations.
- **Research Intern at NVIDIA** June 2021–September 2021
  Built a hyperscale graphics prototyping system for future research in distributed real-time rendering.
- **Software Engineering Intern at NVIDIA** June 2020–September 2020
  Investigated the implementation and performance of geometric proximity queries on GPUs, using both traditional compute cores and ray tracing hardware.
- **Software Engineering Intern at Facebook** September 2018–December 2018
  Optimized read performance of DeleteRange operation in RocksDB, an LSM-tree key-value storage system, providing order-of-magnitude performance improvements over existing implementation.
- **Backend Engineering Intern at Cockroach Labs** January 2018–April 2018
  Implemented and optimized the performance of many distributed query operators in CockroachDB, a distributed SQL database.
- **Software Development Intern at Google** May 2017–August 2017
  Unified user data update APIs, classes, and data structures across multiple flavours of a Display Ads middleware server into a single framework.
- **3D Software Developer at SideFX** September 2016–December 2016
  Created a LIDAR scan importer for Houdini, a 3D modelling and animation application, capable of reading E57 and LAS point data files over 100 GB in size.
- **Agile Engineering Intern at Pivotal Labs** January 2016–April 2016
  Worked on various bespoke Android applications for client companies.
- **Full Stack Web Developer at Imagine Communications** May 2015–August 2015
  Worked on advertisement metadata streaming and other television broadcasting software.

Publications

V. Modi, Y. Chen, A. Madan, S. Sueda, and D. I. W. Levin. Multi-agent path planning with heterogenous interactions in tight spaces. *Computer Graphics Forum*.

Abhishek Madan and David I.W. Levin. Fast evaluation of smooth distance constraints on co-dimensional geometry. *ACM Trans. Graph.*, 41(4), 2022.

Abhishek Madan, Alec Jacobson, and David I. W. Levin. Diffusion Structures for Architectural Stripe Pattern Generation. *arXiv e-prints*, page arXiv:2011.05550, November 2020.

Janusz A. Brzozowski, Sylvie Davies, and Abhishek Madan. State complexity of single-word pattern matching in regular languages. In *Descriptional Complexity of Formal Systems*, pages 86–97, 2019.

Dave Pagurek van Mossel, Abhishek Madan, Tai Meng Liu, Paul Bardea, and Andrew McBurney. Controlling procedural modelling interactively with guiding curves. In *Proceedings of Graphics Interface 2019*, 2019.

Janusz A. Brzozowski, Sylvie Davies, and Abhishek Madan. State complexity of pattern matching in regular languages. *Theoretical Computer Science*, 777:121 – 131, 2019.

Awards

- **Ontario Graduate Scholarship** (2020–2021)

Teaching Experience

- CSC 2521 — Seminar in Geometry and Animation (University of Toronto), Guest Lecturer, Fall 2022
- CSC 417 — Physics-Based Animation (University of Toronto), Teaching Assistant, Fall 2020
- CSC 418/317 — Computer Graphics (University of Toronto), Teaching Assistant, Fall 2019, Winter 2020, Winter 2021, Winter 2022, Fall 2022