Ajay Brahmakshatriya

ajaybr@mit.edu
Massachusetts Institute of Technology
32 Vassar Street
#32-G788
Cambridge, MA (02139)
United States

Graduate Student
COMMIT Group
Computer Science and Artificial Intelligence Lab
https://intimeand.space
+1 617 401 5751

Education

September'20-Present	**Ph.D. in Computer Science, Massachusetts Institute of Technology**
September'18-September'20	**S.M. in Computer Science, Massachusetts Institute of Technology**
August'12-June'16	**B.Tech in Computer Science(Honors), IIT Hyderabad**

Interests

Programming languages, Compilers and Systems

Work Experience

July'16-July'18	**Research Fellow, Microsoft Research India, Bangalore**

Current Research Projects

May'20-Present	**LakePlacid: Separating the Best from the Rest to Improve Latency of Single-Application Deployments**
Advisor	**Prof. Saman Amarasinghe and Prof. Manya Ghobadi**
	Optimizing network applications and network stack implementations using compiler techniques
January'19-Present	**BuildIt: A type based multi-stage programming language extension for imperative languages**
Advisor	**Prof. Saman Amarasinghe**
	A type based multi-stage programming library for imperative languages like C++
September'18-Present	**A Unified Graph Framework for Achieving High-Performance across Algorithms, Graph Types,and Architectures**
Advisor	**Prof. Saman Amarasinghe, Prof. Julian Shun**
	Generating effecient CUDA code for graph algorithms. New GraphIR for portable code generation across multiple platforms.

Awards

- Federick C. Hennie III Award for Teaching Excellence

- Distinguished Paper Award, International Symposium on Code Generation and Optimization (CGO), 2023

- Best Paper Award, International Symposium on Code Generation and Optimization (CGO), 2021

Service

Artifact Evaluation Committee Member

- Static Analysis Symposium (SAS), 2021

- Symposium on Operating Systems and Principles (SOSP), 2021

- International Symposium on Code Generation and Optimization (CGO), 2022

Publications

Ajay Brahmakshatriya, and Saman Amarasinghe. D2X: An eXtensible conteXtual Debugger for Modern DSLs *Proceedings of the International Symposium on Code Generation and Optimization (CGO), 2023.* **Distinguished Paper Award**.

Ajay Brahmakshatriya, and Saman Amarasinghe. GraphIt to CUDA compiler in 2021 LOC: A case for high-performance DSL implementation via staging with BuilDSL *Proceedings of the International Symposium on Code Generation and Optimization (CGO), 2022.*

Nishil Talati, Di Jin, Haojie Ye, **Ajay Brahmakshatriya**, Saman Amarasinghe, Trevor Mudge, Danai Koutra, and Ronald Dreslinski. A Deep Dive Into Understanding The Random Walk-Based Temporal Graph Learning *Proceedings of the IEEE International Symposium on Workload Characterization (IISWC), 2021.*

Ajay Brahmakshatriya, Emily Furst, Victor Ying, Claire Hsu, Changwan Hong, Max Ruttenberg, Yunming Zhang, Tommy Jung, Dustin Richmond, Michael Taylor, Julian Shun, Mark Oskin, Daniel Sanchez, and Saman Amarasinghe. Taming the Zoo: The Unified GraphIt Compiler Framework for Novel Architectures. To appear in *Proceedings of the IEEE/ACM International Symposium on Computer Architecture (ISCA), 2021.*

Ajay Brahmakshatriya, and Saman Amarasinghe. BuildIt: A Type-Based Multi-stage Programming Framework for Code Generation in C++. *Proceedings of the International Symposium on Code Generation and Optimization (CGO), 2021.*

Ajay Brahmakshatriya, Yunming Zhang, Changwan Hong, Shoaib Kamil, Julian Shun, and Saman Amarasinghe. Compiling Graph Applications for GPUs with GraphIt. *Proceedings of the International Symposium on Code Generation and Optimization (CGO), 2021.* **Best Paper Award**.

Jessica Ray, **Ajay Brahmakshatriya**, Richard Wang, Shoaib Kamil, Albert Reuther, Vivienne Sze, and Saman Amarasinghe. Domain-Specific Language Abstractions for Compression. *Proceedings of the Data Compression Conference (DCC), 2021.*

Yunming Zhang, **Ajay Brahmakshatriya**, Xinyi Chen, Laxman Dhulipala, Shoaib Kamil, Saman Amarasinghe, and Julian Shun. Optimizing Ordered Graph Applications with GraphIt. *Proceedings of the International Symposium on Code Generation and Optimization (CGO), 2020.*

Yishen Chen, **Ajay Brahmakshatriya**, Charith Mendis, Alex Renda, Eric Atkinson, Ondrej Sykora, Saman Amarasinghe, and Michael Carbin. BHive: A Benchmark Suite and Measurement Framework for Validating x86-64 Basic Block Performance Models. *Proceedings of the IEEE International Symposium on Workload Characterization (IISWC), 2020.*

Ajay Brahmakshatriya, Piyus Kedia, Hamed Nemati, Derrick McKee, Deepak Garg, Akash Lal, Aseem Rastogi, Anmol Panda, and Pratik Bhatu. CONFLLVM: A Compiler for Enforcing Data Confidentiality in Low-Level Code. *Proceedings of the Fourteenth EuroSys Conference (EUROSYS), 2019.*

Prashant Sharma, **Ajay Brahmakshatriya**, Thomas Valerrian Pasca, Bheemarjun Reddy Tamma, and Anthony Franklin. LWIR: LTE-WLAN Integration at RLC Layer with Virtual WLAN Scheduler for Efficient Aggregation. *Proceedings of the IEEE Global Communications Conference (GLOBECOM), 2016.*