

# Ajay Brahmakshatriya

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## Education

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

## Interests

Programming languages, Compilers and Systems

## Work Experience

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

## Current Research Projects

January'19-Present	<b>BuildIt: A type based multi-stage programming language extension for imperative languages</b>
Advisor	<b>Prof. Saman Amarasinghe</b> A type based multi-stage programming library for imperative languages like C++
May'20-Present	<b>NetBlocks: An Extensible Compiler for Generating Ad-Hoc Network Protocols</b>
Advisor	<b>Prof. Saman Amarasinghe and Prof. Manya Ghobadi</b> Optimizing network applications and network stack implementations using compiler techniques

## 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**, Chris Rinard, Manya Ghobadi and Saman Amarasinghe. NetBlocks: Staging Layouts for High-Performance Custom Host Network Stacks *Proceedings of the International Symposium on Programming Language Design and Implementation (PLDI)*, 2024.

**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. CONFLVM: 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.

