

Ajay Brahmakshatriya

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Education

September'20-Present	Ph.D. in Computer Science, Massachusetts Institute of Technology	5.0/5.0
September'18-September'20	S.M. in Computer Science, Massachusetts Institute of Technology	5.0/5.0
August'12-June'16	B.Tech in Computer Science(Honors), IIT Hyderabad	9.74/10

Interests

Programming languages, Compiler and Systems research

Work Experience

July'16-July'18 **Research Fellow, Microsoft Research India, Bangalore**
May'15-July'15 **Intern, Software Development Engineer, Amazon 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 efficient CUDA code for graph algorithms. New GraphIR for portable code generation across multiple platforms.

Programming X86/64 Assembly, C, C++
Tools LLVM
Some of my projects are hosted at <https://github.com/AjayBrahmakshatriya>

Publications

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.