

## Charles Jin

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RESEARCH INTERESTS	I am broadly interested in learning systems whose knowledge is symbolic in nature. My work tends to borrow techniques from both programming languages and deep learning.	
CONTACT	32 Vassar St, Bldg 32-G730 Cambridge, MA 02139	(469) 734-2803 ccj@csail.mit.edu charlesjin.com
EDUCATION	<p><b>Massachusetts Institute of Technology</b>, September 2019 - Present Ph.D. Student in Computer Science. Advisor: Martin Rinard.</p> <p><b>Yale University</b>, Aug 2012 - May 2016. Combined B.S./M.S. in Computer Science. B.S. in Mathematics, <i>with distinction</i>. GPA: 3.9/4.0.</p>	
AWARDS AND HONORS	<p><b>Schulz Prize</b>, 2016. Awarded to a Silliman College senior for academic excellence in the physical sciences or mathematics. <i>summa cum laude</i>, Yale, 2016. Phi Beta Kappa, Yale, 2015.</p> <p><b>Moulton Ely Grant</b>, 2014. Small grants that provide support for students in entrepreneurial endeavors.</p> <p><b>Sherwood E. Silliman Fellowship</b>, 2013. Covered a 2-week collaboration at Case Western Reserve University.</p> <p><b>Yale College First-Year Summer Research Fellowship in the Sciences &amp; Engineering</b>, 2013. Awarded to approximately 70 students per year. Funded a summer of research on project “Image Segmentation of Dense Capillary Meshes.”</p>	
PREPRINTS	<p><b>Charles Jin</b>, Phitchaya Mangpo Phothilimthana, and Sudip Roy, “<b><math>\alpha</math>NAS: Neural Architecture Search using Property Guided Synthesis</b>”. arXiv:2205.03960. 2022.</p> <p><b>Charles Jin</b>, Melinda Sun, and Martin Rinard, “<b>Provable Guarantees against Data Poisoning Using Self-Expansion and Compatibility</b>”. arXiv:2105.03692. 2021.</p> <p><b>Charles Jin</b> and Martin Rinard. “<b>Manifold Regularization for Locally Stable Deep Neural Networks</b>”. arXiv:2003.04286. 2020.</p>	
REFEREED PUBLICATIONS	<p><b>Charles Jin</b> and Martin Rinard. “<b>Towards Context-Agnostic Learning Using Synthetic Data</b>”. Advances in Neural Information Processing Systems 34 (<b>NeurIPS 2021</b>).</p> <p>Limor Appelbaum, Alexandra Berg, Jose Cambronero, Thurston Dang, <b>Charles Jin</b>, Lori Zhang, Steven Kundrot, Matvey Palchuk, Laura Evans, Irving Kaplan, and Martin Rinard. “<b>Development of a pancreatic cancer prediction model using a multinational medical records database</b>”. Journal of Clinical Oncology (<b>JCO</b>) 39:3_suppl, 394-394. 2021.</p> <p>Muthu Baskaran, <b>Charles Jin</b>, Benoit Meister, and Jonathan Springer. “<b>Automatic Mapping and Optimization to Kokkos with Polyhedral Compilation</b>”. 2020 IEEE High Performance Extreme Computing Conference (<b>HPEC20</b>). Waltham, MA, USA. 2020.</p>	

**Charles Jin**, Muthu Baskaran, Benoit Meister, and Jonathan Springer. “**Automatic Parallelization to Asynchronous Task-Based Runtimes Through a Generic Runtime Layer**”. 2019 IEEE High Performance Extreme Computing Conference (**HPEC19**). Waltham, MA, USA. 2019.

**Charles Jin**, Muthu Baskaran, and Benoit Meister. “**POSTER: Automatic Parallelization Targeting Asynchronous Task-Based Runtimes**”. 2019 28th International Conference on Parallel Architectures and Compilation Techniques (**PACT19**), 465-466. Seattle, WA, USA. 2019.

**Charles Jin** and Muthu Baskaran. “**Analysis of Explicit vs. Implicit Tasking in OpenMP Using Kripke**”. 2018 IEEE/ACM 4th International Workshop on Extreme Scale Programming Models and Middleware (**ESPM2**), 62-70, held in conjunction with **SC18**. Dallas, TX, USA. 2018.

INVITED TALKS      “**Automatic Code Generation to Dynamic Task-Based Runtimes: Recent Results**”. 10th Annual Concurrent Collections Workshop (**CnC 2018**).

TEACHING            **Undergraduate Science and Quantitative Reasoning tutor** at Yale University, Spring 2015 - Spring 2016.

INDUSTRY            **Google, Student Researcher**, September 2021 - Present.

EXPERIENCE

**Google, Research Intern**, June 2021 - September 2021.

**Reservoir Labs, Research Engineer**, June 2018 - August 2019.

- Implemented new backends for a polyhedral optimizing compiler for targeting task-based runtimes (Legion and OpenMP).
- Designed a new lightweight runtime layer to enable automatic extraction of dynamic task-based parallelism. Extended compiler backend to support heterogeneous dynamic task-based parallelism using GPUs (CUDA).
- Evaluated performance of parallel programming models targeting exascale systems with heterogeneous architectures (e.g., OpenMP, Legion, Charm++, Kokkos, OCR).
- Contribute to reports and papers, including grant proposals and reports.

**Weiss Asset Management, Developer / Analyst**, July 2016 - May 2018.

- Built Monte Carlo simulations that model financial derivatives; used in over \$100MM of decisions per year. Improved speed of existing Python PDE solver by 500x.
- Reimplemented critical trade reconciliation engine and application in a layered architecture, improving testability, robustness, and speed. Wrote test suite that exposed several major bugs from previous iteration.
- Managed coordination between software and investment teams, as the sole hybrid developer / analyst.

SELECTED OTHER      **3rd Place, CSI CyberSEED Social Engineering Challenge**, Oct 2015.  
ACTIVITIES            Capture-the-flag challenge to penetrate a fictitious company with a particular focus on exploiting vulnerabilities via social engineering.

**YHack, President and Cofounder**, Fall 2013 - Spring 2015.

Annual hackathon at Yale with over 1000 attendees. [yhack.org](http://yhack.org)