

Charles Jin

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	Massachusetts Institute of Technology , September 2019 - Present Ph.D. Student in Computer Science. Advisor: Martin Rinard. Yale University , Aug 2012 - May 2016. Combined B.S./M.S. in Computer Science. B.S. in Mathematics, <i>with distinction</i> . GPA: 3.96/4.00.	
AWARDS AND HONORS	Schulz Prize , 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. Moulton Ely Grant , 2014. Small grants that provide support for students in entrepreneurial endeavors. Sherwood E. Silliman Fellowship , 2013. Covered a 2-week collaboration at Case Western Reserve University. Yale College First-Year Summer Research Fellowship in the Sciences & Engineering , 2013. Awarded to approximately 70 students per year. Funded a summer of research on project “Image Segmentation of Dense Capillary Meshes.”	
PREPRINTS	Charles Jin , Melinda Sun, and Martin Rinard, “ Defending Against Data Poisoning With Ensembles of Weak Learners ”. Draft available upon request. 2021. Charles Jin and Martin Rinard. “ Manifold Regularization for Adversarial Robustness ”. arXiv:2003.04286. 2020.	
REFEREED PUBLICATIONS	(To appear.) Charles Jin and Martin Rinard. “ Learning From Context-Agnostic Synthetic Data ”. Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS 2021). Limor Appelbaum, Alexandra Berg, Jose Cambronero, Thurston Dang, Charles Jin , Lori Zhang, Steven Kundrot, Matvey Palchuk, Laura Evans, Irving Kaplan, and Martin Rinard. “ Development of a pancreatic cancer prediction model using a multinational medical records database ”. Journal of Clinical Oncology (JCO) 39:3.suppl, 394-394. 2021. Muthu Baskaran, Charles Jin , Benoit Meister, and Jonathan Springer. “ Automatic Mapping and Optimization to Kokkos with Polyhedral Compilation ”. 2020 IEEE High Performance Extreme Computing Conference (HPEC20). Waltham, MA, USA. 2020. 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**).

PROJECTS AND
MANUSCRIPTS

More Annihilating Attacks: an extension of MSZ16, Fall 2015 - Spring 2016.

M.S. thesis advised by Prof. M. Raykova at Yale University.

- Studied algebraic approaches to cryptographic obfuscation with a focus on constructions instantiated from multilinear maps.
- Extended an annihilating attack (MSZ16) on indistinguishable obfuscation instantiated using candidate multilinear maps (GGH13) from a trivial branching program to a more general class.

Code Generation Utility for Finite Field Arithmetic, Fall 2014 - Fall 2015.

Independent project advised by Prof. B. Ford at Yale University.

- Built a code generation utility in Haskell for finite field arithmetic over Curve25519.
- Demonstrated proof-of-concept for automatically generating primitives for elliptic curve cryptography over arbitrary primes without the need for hand-tuned optimizations.

Image Segmentation of Dense Capillary Meshes, Spring 2013 - Spring 2014.

Independent project advised by Prof. M. Choma, MD, at Yale School of Medicine.

- Used video and image segmentation techniques to isolate the capillary mesh of quail cell embryos in Matlab.

TEACHING

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

INDUSTRY
EXPERIENCE

Google, Student Researcher, September 2021 - Present.

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
ACTIVITIES

3rd Place, CSI CyberSEED Social Engineering Challenge, Oct 2015.

Capture-the-flag challenge to penetrate a fictitious company using techniques like social engineering, SQL injection, and buffer overflow attacks.

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

Annual hackathon at Yale with over 1000 attendees. yhack.org

SeeMail, HackPrinceton 2013.

Used an automatically generated signature image to provide email read receipts. Featured in TechCrunch.