

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	<p>Massachusetts Institute of Technology, September 2019 - Present Ph.D. Student in Computer Science. Advisor: Martin Rinard.</p> <p>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.</p>	
AWARDS AND HONORS	<p>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.</p> <p>Moulton Ely Grant, 2014. Small grants that provide support for students in entrepreneurial endeavors.</p> <p>Sherwood E. Silliman Fellowship, 2013. Covered a 2-week collaboration at Case Western Reserve University.</p> <p>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.”</p>	
PREPRINTS	<p>Charles Jin, Melinda Sun, and Martin Rinard, “Defending Against Data Poisoning With Ensembles of Weak Learners”. Draft available upon request. 2021.</p> <p>Charles Jin and Martin Rinard. “Learning From Context-Agnostic Synthetic Data”. arXiv:2005.14707. 2020.</p> <p>Charles Jin and Martin Rinard. “Manifold Regularization for Adversarial Robustness”. arXiv:2003.04286. 2020.</p>	
REFEREED PUBLICATIONS	<p>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”. <i>Journal of Clinical Oncology (JCO)</i> 39:3.suppl, 394-394. 2021.</p> <p>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.</p> <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.</p>	

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 **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.