

Charles Jin

RESEARCH INTERESTS	I am broadly interested in robust machine learning. Currently I am exploring techniques for learning systems whose knowledge is expressed via programs.	
CONTACT	32 Vassar St, Bldg 32-G730 Cambridge, MA 02139	(469) 734-2803 charles.jin@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 and Martin Rinard, “Learning From Context-Agnostic Synthetic Data,” arXiv:2005.14707. 2020. Charles Jin and Martin Rinard, “Manifold Regularization for Adversarial Robustness,” arXiv:2003.04286. 2020.	
REFEREED PUBLICATIONS	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), Seattle, WA, USA, 2019, pp. 465-466. 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), held in conjunction with SC18 , Dallas, TX, USA, 2018, pp. 62-70.	

INVITED TALKS	<p>“Automatic Code Generation to Dynamic Task-Based Runtimes: Recent Results.” 10th Annual Concurrent Collections Workshop (CnC 2018).</p>
PROJECTS AND MANUSCRIPTS	<p>More Annihilating Attacks: an extension of MSZ16, Fall 2015 - Spring 2016. M.S. thesis advised by Prof. M. Raykova at Yale University.</p> <ul style="list-style-type: none"> – 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. <p>Code Generation Utility for Finite Field Arithmetic, Fall 2014 - Fall 2015. Independent project advised by Prof. B. Ford at Yale University.</p> <ul style="list-style-type: none"> – 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. <p>Image Segmentation of Dense Capillary Meshes, Spring 2013 - Spring 2014. Independent project advised by Prof. M. Choma, MD, at Yale School of Medicine.</p> <ul style="list-style-type: none"> – Used video and image segmentation techniques to isolate the capillary mesh of quail cell embryos in Matlab.
TEACHING	<p>Undergraduate Science and Quantitative Reasoning tutor at Yale University, Spring 2015 - Spring 2016.</p>
RELEVANT WORK EXPERIENCE	<p>Reservoir Labs, Research Engineer, June 2018 - present.</p> <ul style="list-style-type: none"> – Designed and implemented compiler backends for OpenMP and Legion as well as a new lightweight runtime layer to enable automatic extraction of dynamic task-based parallelism. Currently extending support to GPUs (CUDA). – Evaluate 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. <p>Weiss Asset Management, Developer / Analyst, July 2016 - May 2018.</p> <ul style="list-style-type: none"> – 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	<p>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.</p> <p>YHack, President and Cofounder, Fall 2013 - Spring 2015. Annual hackathon at Yale with over 1000 attendees. yhack.org</p> <p>SeeMail, HackPrinceton 2013. Used an automatically generated signature image to provide email read receipts. Featured in TechCrunch.</p>