

Calvin McCarter

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EDUCATION **Carnegie Mellon University**, Pittsburgh, PA

Ph.D. in Machine Learning

August 2013 - May 2019

▷ Advisor: Seyoung Kim

GPA: 3.80

▷ Selected Courses: Probabilistic Graphical Models, Convex Optimization, Foundations of Machine Learning Theory, Graduate Molecular Biology

University of Michigan, Ann Arbor, MI

Bachelor of Science in Engineering

August 2009 - May 2013

▷ Major: Computer Science, Minor: Mathematics

GPA: 3.98

▷ Selected Courses: Operating Systems, Computer Architecture, Database Systems, Numerical Methods, Linear Algebra, Theoretical Statistics

EXPERIENCE **Lightmatter**, ML Scientist

January 2021 - Present

Researching ways to accelerate deep learning inference on custom photonic hardware, and to make model accuracy robust to noise and quantization. Helping guide development of next generation of hardware based on analysis of current results.

Tempus Labs, ML Scientist

June 2019 - January 2021

Created a new domain adaptation method that accounts for confounders, which was deployed on the Tempus RNA-seq pipeline as the source-of-truth for all clinical AI models and pharma data deliveries. Developed a new topic model for gene expression deconvolution in metastatic cancers. Explored network learning methods and graph neural nets for gene expression networks and chromosomal rearrangement graphs.

Carnegie Mellon University, PhD Student

August 2013 - May 2019

Worked on sparse graphical model learning problems and scalable optimization algorithms for tasks in systems biology. My focus was on using statistical machine learning to discover the gene regulatory networks which explain the effect of genetic variation on clinical traits.

Van Andel Research Institute, Research Intern

Summer 2013

Worked under the supervision of Brian Haab to apply feature selection method to pancreatic cancer biomarker discovery and to validate method on proteomics database.

Google, Software Engineering Intern

Summer 2012

Worked on server backend for Google Flight Search, developing functionality to improve quality of results for live Flight Search queries.

University of Michigan, Research Assistant

Winter - Fall 2011

Worked under the supervision of Valeria Bertacco and Debapriya Chatterjee to develop post-silicon validation method. Designed and implemented parallel algorithm in CUDA.

Arbor Networks, Summer Intern

Summer 2011

Implemented instrumentation in deep packet inspection system and prepared performance analysis tools geared to IPv6 transition.

University of Michigan, Research Assistant

Summer 2010

Analyzed data from simulated advertising auctions under the supervision of Michael Wellman to understand impact of bidding strategies on advertiser profitability.

PAPERS ML CompArch CompBio	A Basumallik, D Bunandar, N Dronen, L Levkova, C McCarter , L Nair, D Walter, D Widemann, “Adaptive Block Floating-Point for Analog Deep Learning Hardware.” <i>Under review</i> , 2021.	
	R Hanson, D Martin, C McCarter , J Paulson, “If Loud Aliens Explain Human Earliness, Quiet Aliens Are Also Rare.” <i>The Astrophysical Journal (APJ)</i> , 2021.	
	LE Fernandes, . . . , C McCarter , et al., “Real-world Evidence of Diagnostic Testing and Treatment Patterns in US Breast Cancer Patients with Implications for Treatment Biomarkers from RNA-sequencing Data.” <i>Clinical Breast Cancer</i> , 2020.	
	C McCarter , J Howrylak, S Kim, “Learning Gene Networks Underlying Clinical Phenotypes Using SNP Perturbations”, <i>PLOS Computational Biology</i> , 2020.	
	C McCarter and S Kim, “Large-Scale Optimization Algorithms for Sparse Conditional Gaussian Graphical Models”, <i>International Conference on Artificial Intelligence and Statistics (AISTATS)</i> , 2016.	
	C McCarter and S Kim, “On Sparse Gaussian Chain Graph Models”, <i>Advances in Neural Information Processing Systems (NeurIPS)</i> , 2014.	
	S Moon, C McCarter , YH Kuo, “Active learning with partially featured data”, <i>Proceedings of the 23rd International Conference on World Wide Web</i> , 2014.	
	C McCarter , D Kletter, H Tang, K Partyka, Y Ma, S Singh, J Yadav, M Bern, B Haab, “Prediction of Glycan Motifs Using Quantitative Analysis of Multi-lectin Binding”, <i>Proteomics Clinical Applications</i> , vol: 7, issue: 9-10, 2013.	
	D Chatterjee, C McCarter , V Bertacco, “Simulation-based Signal Selection for State Restoration in Silicon Debug”, <i>International Conference on Computer-Aided Design (ICCAD)</i> , 2011.	
PATENTS	J Michuda, . . . , C McCarter , et al., “Systems and methods for multilabel cancer classification.” US Patent App. 17/150,992 (2021).	
	D Bunandar, C McCarter , A Basumallik, “Improving the accuracy of analog linear processor.” US Provisional Patent 63/287,219 (2021).	
SELECTED OPEN-SOURCE CONTRIBUTIONS	onnx2pytorch	https://github.com/ToriML/onnx2pytorch
	Converts ONNX models to PyTorch.	[main contributor]
	PerturbNet	https://github.com/SeyoungKimLab/PerturbNet
	Learns multi-omic gene regulatory networks.	[main contributor]
	MLPerf Inference Benchmark.	https://github.com/mlcommons/inference
	Deep learning benchmark. [memory-efficient pyramidal encoder for RNN-Transducer]	
	matrix-completion	https://github.com/tonyduan/matrix-completion
	Classical matrix completion.	[incremental singular-vector thresholding]
TEACHING	nanopq	https://github.com/matsui528/nanopq
	Product quantization (PQ) and optimized PQ.	[eigenvalue allocation initialization]
ACTIVITIES AND PROFESSIONAL SERVICE	<i>Probabilistic Graphical Models</i> (Teaching Assistant) Spring 2016	
	<i>Introduction to Machine Learning</i> (Teaching Assistant) Fall 2015	
	<i>Paper reviewing</i>	June 2016 - Present
	Reviewer for <i>NeurIPS</i> , <i>IEEE Internet of Things</i> , <i>Statistics and Computing</i> , and <i>SciPy</i> .	
LANGUAGES	<i>Machine Learning Department Student Research Symposium</i> 2014	
	Member of organizing committee. Created website and helped plan symposium.	
	<i>University of Michigan Robocup (Robot Soccer) Team</i> 2009 - 2012	
	Member and team leader (2010-2011). Developed computer vision subsystem.	
	Python (pandas, numpy, numba, PyTorch), Matlab, C++, C, CUDA, R, Shell, L ^A T _E X	