Calvin McCarter

http://calvinmccarter.com/

CONTACT INFORMATION

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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, Boston, MA **January 2021 - Present**

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

Tempus Labs, Chicago, IL **June 2019 - January 2021**

Created a new domain adaptation method that accounts for label shift, which was deployed on the Tempus RNA-seq pipeline to account for protocol batch effects. Developed a new automatic discretization method with applications in survival analysis. Developed a new topic model for gene expression deconvolution in metastatic cancers. Applied network learning and deep learning on graphs to gene regulatory and signaling networks.

Carnegie Mellon University, Pittsburgh, PA **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, Grand Rapids, MI **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, Mountain View, CA **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, Ann Arbor, MI **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, Ann Arbor, MI **Summer 2011**

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

University of Michigan REU Program **Summer 2010**

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

Peer-Reviewed Publications

R Hanson, D Martin, C McCarter, J Paulson, "If Loud Aliens Explain Human Earliness, Quiet Aliens Are Also Rare." The Astrophysical Journal (APJ), To Appear.

LE Fernandes, 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." Clinical Breast Cancer, 2020.

C McCarter, J Howrylak, S Kim, "Learning Gene Networks Underlying Clinical Phenotypes Using SNP Perturbations", *PLOS Computational Biology*, 2020.

C McCarter and S Kim, "Large-Scale Optimization Algorithms for Sparse Conditional Gaussian Graphical Models", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2016.

C McCarter and S Kim, "On Sparse Gaussian Chain Graph Models", *Advances in Neural Information Processing Systems (NeurIPS)*, 2014.

S. Moon, C McCarter, YH Kuo, "Active learning with partially featured data", *Proceedings of the 23rd International Conference on World Wide Web*, 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", *Proteomics Clinical Applications*, vol: 7, issue: 9-10, 2013.

D Chatterjee, C McCarter, V Bertacco, "Simulation-based Signal Selection for State Restoration in Silicon Debug", *International Conference on Computer-Aided Design (ICCAD)*, 2011

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]

Presentations

Transcriptome background tissue correction in metastatic cancers using a correlated composition admixture model.
American Association for Cancer Research (AACR), Annual Meeting 2020.

An efficient algorithm for learning a gene network underlying clinical phenotypes under SNP perturbations.
Genome Informatics meeting at Cold Spring Harbor Labs, November 2017.

Teaching

Probabilistic Graphical Models (Teaching Assistant) Spring 2016
Introduction to Machine Learning (Teaching Assistant) Fall 2015

Activities and Professional Service

Paper reviewing **June 2016 - Present**
Reviewer for *NeurIPS*, *IEEE Internet of Things*, *Statistics and Computing*, and *SciPy*.

Machine Learning Department Admissions Committee **2015**
Reviewed application materials of prospective graduate students.

Machine Learning Department Student Research Symposium **2014**
Member of organizing committee. Created website and helped plan symposium.

English Language Institute Conversation Circle Program **2011 - 2013**
Group leader of conversation circle for ESL students at University of Michigan.

University of Michigan Robocup (Robot Soccer) Team **2009 - 2012**
Member and team leader (2010-2011). Developed computer vision subsystem.

Languages

Python (pandas, numpy, numba, PyTorch), Matlab, C++, C, CUDA, R, Shell, LaTeX