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

Tempus Labs, Chicago, IL **June 2019 - Present**

Designing machine learning methods for precision medicine in cancer. I developed and deployed a new topic model for gene expression deconvolution in metastatic cancers. I created a new domain adaptation method that accounts for label shift, and deployed it on the Tempus RNA-seq pipeline to account for protocol batch effects. I also developed a new automatic nonparametric discretization method with applications in survival analysis. Finally, I am applying network learning and deep learning on graphs to gene regulatory and signaling networks.

Carnegie Mellon University, Pittsburgh, PA **August 2013 - May 2013**

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.

Preprints

Fernandes, Louis E., 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." medRxiv, 2020.

Peer-Reviewed Publications

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

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

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.
Multi-modal structure learning in high dimensions for integrative genomics.
Machine Learning Lunch Seminar. Carnegie Mellon University, October 2015.

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*, *Statistics and Computing*, and *SciPy*.

University of Pittsburgh Biomedical Informatics Training Program **2017**
Mentor to undergraduate research intern through iBRIC program.

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.

Programming

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