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- ABOUT ME** AI researcher and engineer, with Boston, MA
▷ first-author papers in NeurIPS and AISTATS, mccarter.calvin@gmail.com
▷ extensive open-source software contributions, and (616) 272-0909
▷ experience training neural networks at fast-paced teams.
- EXPERIENCE** **Amazon Alexa AI**, Applied Scientist **June 2022 - Present**
Researching and developing neural retrieval and ranking methods for entity resolution. Training and deploying models to newly-onboarding Alexa use-cases.
- Lightmatter**, ML Scientist **January 2021 - February 2022**
Researched ways to accelerate deep learning inference on photonic AI accelerator. Explored finetuning strategies to ensure model accuracy despite hardware noise and quantization. Helped invent next generation of hardware architecture to improve noise robustness.
- Tempus Labs**, ML Scientist **June 2019 - January 2021**
Created and validated a new batch effect correction method, 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**
Developed novel sparse graphical models and scalable optimization algorithms for disease systems biology. Used statistical 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 in 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 for international results for live Flight Search queries.
- 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
- LANGUAGES** Python (PyTorch, TensorFlow, pandas, NumPy, Numba), C, C++, CUDA, Matlab
- PATENTS** D Bunandar, [C McCarter](#), A Basumallik, “Improving the accuracy of analog linear processor.” US Patent App. 18/077,177 (2022).
J Michuda, et int., [C McCarter](#), et al., “Systems and methods for multilabel cancer classification.” US Patent App. 17/150,992 (2021).

- PUBLICATIONS
- CompArch
CompBio
ML
▷ J Michuda, et int., [C McCarter](#), et int., T Taxter, “Validation of a transcriptome-based assay for classifying cancers of unknown primary origin”, *Mol Diagn Ther*, 2023.
 - ▷ [C McCarter](#) and N Dronen, “Look-ups are not (yet) all you need for deep learning inference.” *Sparsity in Neural Networks Workshop*, 2022.
 - ▷ R Hanson, D Martin, [C McCarter](#), J Paulson, “If Loud Aliens Explain Human Earliness, Quiet Aliens Are Also Rare.” *The Astrophysical Journal (APJ)*, 2021.
 - ▷ LE Fernandes, et int., [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.” *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”, *AISTATS*, 2016.
 - ▷ [C McCarter](#) and S Kim, “On Sparse Gaussian Chain Graph Models”, *NeurIPS*, 2014.
 - ▷ S Moon, [C McCarter](#), YH Kuo, “Active learning with partially featured data”, *Proceedings of the 23rd International Conference on World Wide Web (WWW)*, 2014.
 - ▷ [C McCarter](#), et int., B Haab, “Prediction of Glycan Motifs Using Quantitative Analysis of Multi-lectin Binding”, *Proteomics Clinical Applications*, 7: 9-10, 2013.
 - ▷ D Chatterjee, [C McCarter](#), V Bertacco, “Simulation-based Signal Selection for State Restoration in Silicon Debug”, *ICCAD*, 2011.

- PREPRINTS
- ▷ [C McCarter](#), “Towards Backwards-Compatible Data with Confounded Domain Adaptation”, arXiv:2203.12720, 2022.
 - ▷ A Basumallik, et int., [C McCarter](#), et al., “Adaptive Block Floating-Point for Analog Deep Learning Hardware”, arXiv:2205.06287, 2022.

- SELECTED
OPEN-SOURCE
CONTRIBUTIONS
- ConDo <https://github.com/calvinmccarter/condo-adapter>
Toolbox for Confounded Domain Adaptation. [author]
 - 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. [author]
 - MLPerf Inference <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]
 - PyTorch <https://github.com/pytorch/pytorch>
Deep learning framework. [added LazyInstanceNorm]
 - nanopq <https://github.com/matsui528/nanopq>
Product quantization (PQ) and optimized PQ. [eigenvalue allocation initialization]

- ACTIVITIES
- Elicitation of latent knowledge (ELK) award contest* **February 2022**
AI Alignment Research Center (AI safety proposal received honorable mention).
 - Middle school science fair judging* **2015-2020**
Science fair judge for PA Junior Academy of Science and Chicago Public Schools.
 - 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.