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Marc Finzi

Education

2019 - Now **Ph.D. in Computer Science**, *NYU Courant*, NYC.

2017 - 2019 **Masters in Operations Research**, *Cornell*, Ithaca, NY.

2013 - 2017 **B.S. Physics**, *Harvey Mudd College*, Claremont, CA, GPA: 3.7.

Experience

2017 - Present **PhD Student**, *Andrew G. Wilson's lab*, NYU.

Deep Learning: Building in inductive biases for structured data outside of images, video, text such as with

- Irregularly sampled spatial data
- Equivariance and Symmetries
- Physical Priors and Dynamical Systems
- Probabilistic and Generative models

Summer 2020 **Research Intern at Qualcomm**, *with Max Welling*, Amsterdam, NL.

- Developed probabilistic numeric convolutional neural networks, an approach that reasons about internal discretization errors probabilistically
- Project culminating in ICLR2021 Submission and patent application

Summer 2019 **Applied Scientist intern at Amazon**, Seattle, WA.

- Applying deep learning methods for ranking and recommendation
- Experience with models traditionally used for NLP such as LSTM and Transformer

2015 - 2017 **Undergraduate Thesis in Physics**, *Tom Donnelly's lab*, Harvey Mudd College.

- Led three-man HMC team at UT Austin to conduct laser physics experiment
- Applied computer vision to detect and register microspheres in SEM images, achieving 95% accuracy.

Summers 2014, 2015 **Applied Physics Intern at NASA**, *Alexander Kutyrev's lab*, NASA Goddard Space Flight Center.

- Implemented a camera based image registration system to measure of mechanical positioning to sub-micron precision.
- Embedded systems programming, analogue and digital circuit design, PCB design

Technical Skills

Relevant Coursework: Advanced Machine Learning Systems, Computer Vision, Bayesian Machine Learning, Topics in ML optimization, Numerical Analysis for Data Science, Approximate Dynamic Programming, Algorithms, Stochastic Processes

Languages: Python: 30k+ LoC, C++: 4k+ LoC, LaTeX.

Reviewing: AISTATS 2019, ICML 2019, NeurIPS 2019, ICLR 2020, NeurIPS 2020

Publications

M. Finzi, R. Bondesan, and M. Welling. Probabilistic numeric convolutional neural networks. *ICLR Submission*, 2021.

P. Izmailov, P. Kirichenko, M. Finzi, and A. G. Wilson. Semi-supervised learning with normalizing flows. *ICML*, 2020.

M. Finzi, A. Wang, and A. G. Wilson. Simplifying hamiltonian and lagrangian neural networks via explicit constraints. *NeurIPS*, 2020.

M. Finzi, S. Stanton, P. Izmailov, and A. G. Wilson. Generalizing convolutional neural networks for equivariance to lie groups on arbitrary continuous data. *ICML*, 2020.

G. Benton, M. Finzi, P. Izmailov, and A. G. Wilson. Learning invariances in neural networks from training data. *NeurIPS*, 2020.

M. Finzi, P. Izmailov, W. Maddox, P. Kirichenko, and A. G. Wilson. Invertible convolutional networks. *ICML 2019 INNF Workshop*, 2019.

B. Athiwaratkun, M. Finzi, P. Izmailov, and A. G. Wilson. There are many consistent explanations of unlabeled data: Why you should average. *ICLR*, 2019.