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Eric M. Fischer

Computer Vision Engineer
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Background

Purpose: I received my undergraduate degree at UCLA and am currently pursuing a MS in Computer Science with a specialization in Artificial Intelligence. My research interests lie within computer vision, natural language processing, and generative modeling. I am a research student at the Center for Vision, Cognition, Learning, and Autonomy at UCLA.
Interests: Computer Vision, Natural Language Processing, Generative Learning, Deep Learning, Markov Chain Monte Carlo, Autonomous Driving, Energy-Based Models, Sampling, Time Series, Econometrics

Publications

Learning Deep Generative Models with Short-Run Inference Dynamics | CVPR | 2019
- Under submission

Text Generation with Deep Generative Models | CVPR | 2019
- Under submission

Research

Advanced Lane Finding for Self-Driving Cars | github.com/EricMFischer/self-driving-car-nano-degree | 2019
- Constructed camera calibration and image pipeline model for finding lanes on road for self-driving cars

T-Snake Model for Generative Inpainting | github.com/CS269-Capstone/t-snake-capstone | 2019
- Used a topology adaptive snake (T-snake) model to improve the quality of object masks before giving them to generative adversarial network for generative inpainting

EEG Classification with CNNs | github.com/ee239as-project/EEG-classification-with-CNN | 2019
- With heavy data augmentation and Convolutional Neural Network (CNN) models applied to 4 second data samples, predicted at 72% test accuracy the motor tasks asked of subjects

Exact & Cluster Sampling Ising Model | github.com/EricMFischer/exact-and-cluster-sampling-markov-chains | 2019
- Convergence analysis of exact sampling using coupled Markov chains and Swendsen-Wang cluster sampling

First-Order Optimization Methods for CNN | github.com/EricMFischer/first-order-nn-optimization | 2019
- Implementation and convergence analysis of stochastic gradient descent (SGD) with momentum, SGD with Nesterov momentum, Root Mean Square Prop, and ADAM for a CNN

Variational Lower Bound Formulation and App. of VAE | github.com/EricMFischer/variational-autoencoder | 2019
- Formal derivation of the variational lower bound and an application of variational autoencoder to the MNIST dataset

Technical Skills

Deep Learning: CNN, RNN, LSTM, GRU, Computer Vision, NLP, Generative Learning, Autoencoders, Reinforcement Learning, Neural Network Optimization, Machine Learning, Data Mining
Statistics and Linear Algebra: Statistical Modeling, Bayesian Statistics, Markov Chain Monte Carlo, Probabilistic Graphical Models, Matrix Algebra, Linear Algebra, Applied Probability, Time Series, Econometrics
Software Engineering: Operating Systems (Linux, macOS, Ubuntu), Languages (Python, C/C++, R, JavaScript, PHP), Frameworks (Pytorch, Tensorflow, Keras, React), DevOps (Git, AWS, Cloudflare), Web Tools (Heap, Optimizely), Other (data cleansing, shell scripts, TDD)

Education

University of California, Los Angeles | MS Computer Science | 3.5 GPA **2018 - 2020**
- Specialization: Artificial Intelligence
- Machine learning coursework spans computer science, statistics, and electrical and computer engineering

Hack Reactor | Advanced Software Engineering Immersive Program | San Francisco, CA **2015**
- Full stack software engineering curriculum with emphasis on data structures and algorithms

University of California, Los Angeles | BA Philosophy | 3.7 GPA | 3.9 Major GPA **2009 - 2013**

- Emphasis: First-Order Logic
- Cum Laude Honors

Universidad Complutense de Madrid | BA Philosophy | Madrid, Spain **2011 - 2012**

- Philosophy coursework in Spanish

Coursework

UCLA Graduate Coursework

STAT 200A - *Applied Probability* (audited)
STAT 201C - *Advanced Modeling and Inference*
STAT 202B - *Matrix Algebra and Optimization*
STAT 202C - *Monte Carlo Methods for Optimization*
CS 247 - *Advanced Data Mining*
CS 251A - *Advanced Computer Architecture*
CS M266A - *Statistical Modeling and Learning in Vision and Cognition* (audited)
CS 260 - *Machine Learning Algorithms* (audited)
CS M276A - *Pattern Recognition and Machine Learning*
CS 269 - *Seminar in Artificial Intelligence: Deformable Models*
ECE 236C - *Optimization for Large-Scale Systems*
ECE 239AS - *Neural Networks and Deep Learning*

Independent Coursework

CS 224n: Natural Language Processing with Deep Learning, Stanford University on web.stanford.edu
CS 231n: Convolutional Neural Networks for Visual Recognition, Stanford University on cs231n.stanford.edu
Deep Learning Specialization - *I) Neural Networks and Deep Learning, II) Improving Deep Neural Networks: Hyperparameter Tuning, Regularization, and Optimization, III) Structuring Machine Learning Projects, IV) Convolutional Neural Networks, V) Sequence Models*, Stanford University on Coursera
Neural Networks for Machine Learning, University of Toronto on Coursera
Digital Signal Processing, École Polytechnique Fédérale de Lausanne
Probabilistic Graphical Models - *I) Representation, II) Inference, and III) Learning*, Stanford University on Coursera
Mathematics for Machine Learning - *I) Linear Algebra, II) Multivariate Calculus, III) PCA*, ICL on Coursera
Linear Algebra, University of Texas Austin on edX
The Science of Uncertainty - Probability, MIT on edX
Algorithms Specialization - *I) Divide and Conquer, Sorting and Searching, and Randomized Algorithms, II) Graph Search, Shortest Paths, and Data Structures, III) Greedy Algorithms, Minimum Spanning Trees, and Dynamic Programming, IV) Shortest Paths Revisited, NP-Complete Problems,* Stanford University on Coursera

Free Reading

Deep Learning, Ian Goodfellow, Yoshua Bengio, Aaron Courville
Pattern Recognition and Machine Learning, Christopher M. Bishop
Causality: Models, Reasoning, and Inference, Judea Pearl

Experience

Center for Vision, Cognition, Learning, and Autonomy | Graduate Researcher | Los Angeles, CA **2019-current**

- Develop state-of-the-art computer vision, natural language processing, and deep generative models
- Collaborate with other researchers and engineers to develop code and experiments that advance entire project

NatureBox | Full Stack Software Engineer | Redwood City, CA **2016 - 2018**

- Main contributor for new React web app after Naturebox added direct-to-consumer business
  - Used Flux/React architecture with Flow and ImmutableJS additions; constructed new backend API
- Led projects such as Litle to Stripe payment processor migration, Login and Pay with Amazon, Referrals, API v2
  - Worked on frontend, backend, and with DB, performed most devops, security tasks, led engineering meetings

Cinemagram | Software Engineer | San Francisco, CA **2015 - 2016**

- Worked with JavaScript, Ruby, SQL, and Redis to construct data management interfaces
- Wrote and ran Snapchat client in PHP for growth campaigns, acquiring roughly 150K users in 6 months

Flinja | Software Engineer | Los Angeles, CA **2012 - 2014**

- Main contributor for Flinja.com website that won VentureBeat/IDG 2012 award for Best Social Platform

Scholarships, Honors, Society Memberships

- Awarded Bristol-Myers Squibb $20,000 college scholarship given to five applicants per year
- 2nd place in Los Angeles County and California Science Fair for “Mechanical Exfoliation and Characterization of Graphene via Raman Spectroscopy”, conducted at UCLA with Carlos Manuel Torres Jr. in 2009
- UCLA Engineering Student Association member
- Organized with the LA Clippers Foundation various SAT and ACT programs across LA County free for students
- Beta Theta Pi President
- Phi Beta Kappa society member

Additional Information

Other technical interests: Built own PC with Nvidia GPUs for machine learning, built 3d printer, SpaceX
Personal: Fluent in English, Spanish, and Portuguese