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EDUCATION

Stanford University (September 2016 to present)

Stanford, CA

Ph.D. in Computational Mathematics, GPA: 3.97

Harvey Mudd College (August 2012 to May 2016)

Claremont, CA

B.S. in Mathematics, GPA: 3.91 (overall), 3.93 (major)

TECHNICAL SKILLS

Deep learning: generative adversarial networks, variational autoencoders, natural language processing, reinforcement learning, computer vision, TensorFlow, PyTorch, TA experience for [Stanford's CS 236: Deep Generative Models](#)

Math fundamentals: discrete math, linear algebra, multivariable calculus, ODEs, PDEs, probability, statistics

Pure math: real analysis, differential geometry, measure theory, probability theory, functional analysis, abstract algebra

Computer science: data structures, algorithms, computer systems, numerical linear algebra, numerical optimization

Programming: C++, CSS, Java, JavaScript (e.g. Node, React), Haskell, HTML, LaTeX, Linux, Mathematica, PHP, Python, SQL

RESEARCH AND WORK EXPERIENCE

Stanford University with Jose Blanchet & Peter Glynn (September 2018 to present)

Stanford, CA

- Posed an abstract optimization problem in the space of probability measures that includes generative modeling, model-free reinforcement learning, and variational inference as special cases.
- Developed [probability functional descent](#), a generic descent algorithm in the space of probability measures.
- Demonstrated that the method naturally leads to standard deep learning techniques like adversarial training.
- Proved that the method recovers a wide range of existing algorithms, such as minimax GAN, non-saturating GAN, Wasserstein GAN, policy iteration, actor-critic, black-box variational inference, and adversarial variational Bayes.

Google Brain with David Berthelot & Ian Goodfellow (June 2018 to September 2018)

Mountain View, CA

- Designed and prototyped a new approach to video synthesis using generative adversarial networks.
- Formalized a theoretical framework in which the problem separates into a choice of 1D GAN and a choice of 2D GAN.
- Developed a flexible experimental codebase that allowed for quick experimentation with 1D, 2D, and 3D GANs.
- Performed a thorough investigation that highlighted the promise of one particular pair of 1D and 2D GAN.
- Informally discussed and provided feedback on the design of automatic differentiation in Swift for TensorFlow.

Google Research with Andrey Zhmoginov & Mark Sandler (June 2017 to September 2017)

Mountain View, CA

- Designed a generative adversarial network that modifies facial expressions in a given photograph.
- Researched state-of-the-art approaches to image synthesis, such as CycleGAN, BEGAN, and SRGAN.
- Proposed novel combinations and modifications that suit the particular problem of facial expression synthesis.
- Implemented and tested over 70 experimental models using TensorFlow and Google's internal infrastructure.
- Presented a talk, [CycleGAN, a Master of Steganography](#), at the Machine Deception workshop at NIPS 2017.

Harvey Mudd College with Weiqing Gu (September 2015 to May 2016)

Claremont, CA

- Investigated the use of geometry, specifically differential geometry, in the analysis of data.
- Constructed a [three-step framework](#) to discover patterns in time series data: assign distance, cluster, forecast.
- [Defined Riemannian metrics](#) on the space containing the data, providing a novel way to probe data for insight.
- Received the department's Chavin Prize for outstanding paper in the mathematical sciences.

Facebook, Front-End Engineering Intern (May 2014 to August 2014)

Menlo Park, CA

- Prototyped and iterated on a new way to interact with notifications on Facebook's web site, using PHP and JavaScript.
- Acted as the point-of-contact for internal feedback and addressed concerns regarding the new interaction.
- Oversaw its testing and release to millions of users and interpreted the resulting data.
- Rewrote and improved the scrolling and positioning logic of the right-hand column on the Facebook home page, resulting in a dramatic 4% increase in revenue from the ads placed there.