Yair Schiff

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yair-schiff.github.io

RESEARCH INTERESTS

Generative modeling, Optimal transport, AI for Science, AI for Social Good

EDUCATION

CORNELL UNIVERSITY – DEPARTMENT OF COMPUTER SCIENCE, New York, NY   2022 – Present
PhD student in Computer Science
Advisor: Professor Volodymyr Kuleshov
- *Fellowships:* Hal & Inge Marcus PhD Fellowship (2022-2023)
- *Awards:* Cornell Tech Outstanding TA Award (2023)
- *Teaching:* Applied Machine Learning (TA Fall 2022), Deep Learning (TA Spring 2023)

NEW YORK UNIVERSITY – COURANT INSTITUTE OF MATHEMATICAL SCIENCES, New York, NY   May 2019
MS in Computer Science, GPA: 3.97/4.00
- *Relevant Coursework:* Advanced Machine Learning, Artificial Intelligence, Computer Vision, Deep Learning, Graphical Processing Units, Machine Learning, Mathematics of Deep Learning, Predictive Analytics

UNIVERSITY OF PENNSYLVANIA – COLLEGE OF ARTS AND SCIENCES, Philadelphia, PA   May 2014
BA Summa Cum Laude with Distinction in Economics, GPA: 3.93/4.00
- *Academic Honors:* Phi Beta Kappa, Dean's list 2010-2014

RESEARCH AND PUBLICATIONS

PUBLICATIONS

Caduceus: Bi-Directional Equivariant Long-Range   ICML 2024
DNA Sequence Modeling
Yair Schiff, *Chia-Hsiang Kao, Aaron Gokaslan, Tri Dao, Albert Gu, Volodymyr Kuleshov*

DySLIM: Dynamics Stable Learning by Invariant Measure for Chaotic Systems   ICML 2024
Yair Schiff, *Zhong Yi Wan, Jeffrey B. Parker, Stephan Hoyer, Volodymyr Kuleshov,*
Fei Sha, Leonardo Zepeda-Núñez

InfoDiffusion: Representation Learning   ICML 2023
Using Information Maximizing Diffusion Models
Yingheng Wang, ***Yair Schiff,*** *Aaron Gokaslan, Weishen Pan, Fei Wang,*
Christopher De Sa, Volodymyr Kuleshov

Semi-Autoregressive Energy Flows: Exploring Likelihood-Free   ICML 2023
Training of Normalizing Flows
Phillip Si, Zeyi Chen, Subham Sekhar Sahoo, ***Yair Schiff,*** *Volodymyr Kuleshov*

Learning with Stochastic Orders   ICLR 2023
Carles Domingo-Enrich, ***Yair Schiff,*** *Youssef Mroueh*   *(Notable Top 25% acceptance)*

Semi-Parametric Inducing Point Networks and Neural Processes   ICLR 2023
Richa Rastogi, ***Yair Schiff,*** *Alon Hacohen, Zhaozhi Li, Ian Lee, Yuntian Deng,*
Mert R. Sabuncu, Volodymyr Kuleshov

Cloud-Based Real-Time Molecular Screening Platform
with MolFormer
Brian Belgodere, Vijil Chenthamarakshan*, Payel Das*, Pierre Dognin*,
Toby Kurien*, Igor Melnyk*, Youssef Mroueh*, Inkit Padhi*, Mattia Rigotti*,
Jarret Ross*, Yair Schiff*, Richard A. Young**

[ECML PKDD 2022 Demo Track](#)
*(*alphabetical order
equal contribution)*

Optimizing Functionals on the Space of Probabilities with
Input Convex Neural Networks
David Alvarez-Melis, Yair Schiff, Youssef Mroueh

[Transactions of Machine Learning Research](#)

Augmenting Molecular Deep Generative Models with
Topological Data Analysis Representations
Yair Schiff, Vijil Chenthamarakshan*, Samuel Hoffman*,
Karthikeyan Natesan Ramamurthy*, Payel Das**

[ICASSP 2022](#)
(*equal contribution)

Predicting Deep Neural Network Generalization with Perturbation Response Curves
Yair Schiff, Brian Quanz, Payel Das, Pin-Yu Chen

[NeurIPS 2021](#)

Tabular Transformers for Modeling Multivariate Time Series
*Inkit Padhi, Yair Schiff, Igor Melnyk, Mattia Rigotti, Youssef Mroueh, Pierre Dognin,
Jarret Ross, Ravi Nair, Erik Altman*

[ICASSP 2021](#)

Image Captioning as an Assistive Technology: Lessons Learned from
VizWiz 2020 Challenge
Pierre Dognin, Igor Melnyk*, Youssef Mroueh*, Inkit Padhi*, Mattia Rigotti*,
Jarret Ross*, Yair Schiff*, Richard Young, Brian Belgodere*

[Journal of AI Research](#)
*(*alphabetical order
equal contribution)*

WORKSHOPS

Advancing DNA Language Models: The Genomics Long-Range Benchmark
*Evan Trop, Chia-Hsiang Kao, Mckinley Polen, Yair Schiff, Bernardo P. de Almeida,
Aaron Gokaslan, Thomas Pierrot, Volodymyr Kuleshov*

[AAAI Workshop 2024](#)
[ICLR Workshop 2024](#)

Optimizing Functionals on the Space of Probabilities with
Input Convex Neural Networks
David Alvarez-Melis, Yair Schiff, Youssef Mroueh

[NeurIPS Workshop 2021](#)
Spotlight presentation

Gi and Pal Scores: Deep Neural Network Generalization Statistics
Yair Schiff, Brian Quanz, Payel Das, Pin-Yu Chen

[ICLR Workshop 2021](#)

Characterizing the Latent Space of Molecular Deep Generative Models
with Persistent Homology Metrics
Yair Schiff, Vijil Chenthamarakshan, Karthikeyan Natesan Ramamurthy, Payel Das

[NeurIPS Workshop 2020](#)
Spotlight presentation

Alleviating Noisy Data in Image Captioning with Cooperative Distillation
Pierre Dognin, Igor Melnyk*, Youssef Mroueh*, Inkit Padhi*, Mattia Rigotti*,
Jarret Ross*, Yair Schiff**

[CVPR Workshop 2020](#)
*(*alphabetical order,
equal contribution)*

PREPRINTS

Cross-species plant genomes modeling at single nucleotide resolution
using a pre-trained DNA language model
*Jingjing Zhai, Aaron Gokaslan, Yair Schiff, Ana Berthel, Zong-Yan Liu, Zachary R Miller
Armin Scheben, Michelle C Stitzer, Cinta Romay, Edward S. Buckler, Volodymyr Kuleshov*

[bioRxiv](#)

Auditing and Generating Synthetic Data with Controllable Trust Trade-offs [arXiv](#)

Brian Belgodere, Pierre Dognin, Adam Ivankay, Igor Melnyk, Youssef Mroueh,
Aleksandra Mojsilovic, Jiri Navartil, Apoorva Nitsure, Inkit Padhi, Mattia Rigotti,
Jerret Ross, **Yair Schiff**, *Radhika Vedpathak, Richard A. Young*

TALKS AND PRESENTATIONS

Topological Data Analysis and Beyond Workshop [NeurIPS 2020](#)
- Presented spotlight poster "Characterizing the Latent Space of Molecular Deep Generative Models" ([video](#))

VizWiz Grand Challenge Workshop [CVPR 2020](#)
- Presented winning submission to VizWiz Grand Challenge ([video](#))
- Presented "Alleviating Noisy Data in Image Captioning with Cooperative Distillation" ([video](#))

OPEN-SOURCE CONTRIBUTIONS

Caduceus [Github.com](#)
- Authored codebase for long-range DNA sequence modeling using newly proposed Caduceus model.

swirl-dynamics [Github.com](#)
- Added a project for modeling dynamical systems using a regularized objective that aims to preserve systems' invariant measures

SPIN: Semi-Parametric Inducing Point Networks and Neural Process [Github.com](#)
- Implemented Inducing Point Neural Processes and wrote code for training and evaluation

TabFormer: Tabular Transformers for Modeling Multivariate Time Series [Github.com](#)
- Wrote code for training and evaluating GPT-like models on tabular data to generate new, synthetic data that matches the underlying distributions of the real table variables

pytorch-PPUU: Prediction and Policy-learning Under Uncertainty [Github.com](#)
- Added a new dataset on which the self-driving policy could be trained
- Enhanced the self-driving vehicle's policy to enable dynamic lane changes

PROFESSIONAL SERVICES
- ICML 2024 reviewer
- NeurIPS 2023 reviewer – [Top Reviewer Recipient](#)

WORK EXPERINCE

GOOGLE, New York, NY   May 2023 – Oct 2023
Student Researcher
- Researched new methods for stabilizing autoregressive rollouts of dynamical system models
- Contributed to internal Google and open-source libraries for modeling dynamical systems

IBM WATSON MACHINE LEARNING, New York, NY   Aug 2019 – Aug 2022
Cognitive Software Developer
- Contributed to continuous development and testing of Watson Machine Learning products
- Facilitated weekly Cloud releases, Cloud Pak for Data platform releases, and the launch of AutoAI feature engineering on relational data, AutoAI Time Series, AutoAI Notebooks, and Federated Learning products
- Published 6 medium.com articles about Watson Machine Learning product releases
- Received Outstanding Technical Achievement Award for work on the release of AutoAI feature engineering on relational data

- Received CrushIT Team Excellence Award as part of the Watson Machine Learning Training team

Research Contributor to IBM Research AI Challenges   Aug 2019 – Aug 2022
- Volunteered to contribute to IBM Research AI challenges, working with the Trusted AI Department
- Member of the first-place winning team in the 2020 VizWiz Grand Challenge: Image Captioning as an Assistive Technology for the Visually Impaired
- Co-authored with the Trusted AI team on several publications in the fields of Generative Modeling, Molecular Discovery, Deep Learning Generalization, and AI for Social Good
- Received two 2021 IBM Research Accomplishments awards for contributions to (1) trustworthy AI generative modeling and (2) deployment of large-scale transformer models on OpenShift environments

SIMON-KUCHER AND PARTNERS, New York, NY   Sept 2014 – Aug 2017
Consultant
- Advised global companies spanning various industries – including internet, media, consumer electronic goods, and chemicals – on areas for better revenue capture
- Synthesized large data sets (e.g., 300 million+ client transactions), customer research (surveys & conjoint studies sent to thousands of respondents), and secondary research to create solutions to client needs

GROUPS AND AFFILIATIONS

GRADS FOR GENDER INCLUSION IN COMPUTING, New York, NY   Present
Member
- Member of a group dedicated to combating harassment, pushing for policy change, and creating supportive spaces

STUDENT-APPLICANT SUPPORT PROGRAM, New York, NY   Present
Volunteer
- Provide feedback and support to students applying to graduate programs in Computer Science and related fields

PHD PEER MENTOR PROGRAM, New York, NY   Present
Mentor
- Meet with fellow PhD student to provide guidance about graduate school life at Cornell Tech

SKILLS

- *Programming Languages:* C++, Java, Python
- *Deep Learning Frameworks:* PyTorch, PyTorch Lightning
- *Data Tools:* Excel, Stata, Tableau
- *Foreign Languages:* Fluent in Hebrew