

Education

- University of Washington** Seattle, WA
Ph.D. in Computer Science and Engineering *August 2021*
 - Advised by Sham M. Kakade (joint Computer Science & Statistics) and Zaid Harchaoui (Statistics).
 - Doctoral Committee: Sham M. Kakade Zaid Harchaoui, Noah A. Smith, Sewoong Oh, Lalit Jain.
 - Dissertation: Leveraging Generative Models for Music and Signal Processing.
- University of Washington** Seattle, WA
M.Sc. in Computer Science and Engineering *December 2017*
 - Coursework in Optimization, Algorithms, Learning Theory, Information Theory, Reinforcement Learning.
- Brown University** Providence, RI
Sc.B. Magna cum Laude with Honors in Applied Mathematics *May 2013*
 - Advised by Björn Sandstede and Eugene Charniak.
 - Coursework in Machine Learning, Computer Vision, Natural Language Processing, Probability Theory, Stochastic Processes, Real and Complex Analysis, Operator Theory.
 - Associate Member, Sigma Xi Scientific Honor Society.
- Hamilton College Bridge Program** Clinton, NY
(High School Credit) *2005-2007*
 - Coursework in Programming Languages, Computer Architecture, Operating Systems, Abstract Algebra.

Major Grants and Awards

- Stanford HAI Google Cloud Credits Grant: \$15,000 (2022).
- Neurips Outstanding Paper Award: 6 / 9122 paper submissions (2021).
- Qualcomm Innovation Fellowship: \$100,000 (2020).
- NSF Graduate Research Fellowship: \$138,000 (2017-2019).
- Brown University Distinguished Senior Thesis Award (university-wide award, 2013).

Teaching

- CSE599i: [Generative Models](#) (Autumn, 2020). Predoctoral Instructor (Instructor of Record).
 - Created a new course offering covering advances in generative modeling from 2010-2020.
 - Developed course materials from scratch including lecture notes, slides, and homework.
 - Top-decile teaching reviews: 4.9/5.0 overall course quality with a 53% response rate (16/30 students).
- CSE490: An Introduction to Deep Learning (Autumn, 2018). Guest Lecturer.
- CSE546: Machine Learning (Spring 2018). Guest Lecturer.
- CSE547: Machine Learning for Big Data (Spring, 2016). Teaching Assistant, Guest Lecturer.
- CSE546: Machine Learning (Autumn, 2015). Teaching Assistant.

Work Experience

- Stanford University** Palo Alto, CA
Postdoctoral Scholar - Stanford Artificial Intelligence Laboratory *September 2021 - Present*
 - Advised by Percy Liang (joint Computer Science & Statistics).
- University of Washington** Seattle, WA
Ph.D. Candidate - Computer Science and Engineering *September 2015 - August 2021*

- Built a track-record of machine learning research with publications at ICML, Neurips, ICLR, ICASSP, ISMIR.
- Created the current best music transcription model in the MIREX Multi-F0 Challenge.
- Designed, built, and administered a GPU computing cluster to support two research groups (~ 40 GPUs).

• **Amazon**

Seattle, WA

• *Applied Science Intern - Amazon Music Machine Learning*

June 2019 – Aug. 2019

- Hosts: Ted Sandler, Ben London.
- Built a recommendation model using deep contextual bandits to sequence tracks on Amazon Music stations.
- Used counterfactual risk minimization to train models off-policy from logged user interaction data.

• **Bracebridge Capital - Fixed Income Arbitrage Hedge Fund**

Boston, MA

• *Quantitative Developer (Lead Developer) - Quantitative Research*

July. 2013 – May 2015

- Led and mentored a team of three software engineers developing C++ software infrastructure.
- Maintained models governing a billion dollar asset backed structured product portfolio.
- Architected front-office data acquisition, coordinating between research, vendors, the trading floor, and IT.
- Built in-house models of implied volatilities and sensitivities, with applications to rates products.

• **Bracebridge Capital**

Boston, MA

• *Summer Analyst - Quantitative Research*

June 2012 – Aug. 2012

- Rebuilt a legacy Excel product model using modern technologies: C#, Postgres, JavaScript.
- Completed a quant training course on valuation and risk models, with a focus on fixed income products.

• **Sirius Software - Database Vendor**

Cambridge, MA

• *Software Engineer - Systems Software Engineering*

Jan. 2008 – May 2012

- Built modern language features into the Model 204 database bytecode query language compiler.
- Designed and implemented system libraries for reporting, parsing, and web-communication.
- Linux systems administration: DNS, internal services, backups, software updates, security, documentation wiki.

Other Experience

• **Panjandrum.ai - Virtual Avatar Music**

Seattle, WA

• *Advisor*

June 2020 - Present

- Provided advice and technical strategy for applications of machine learning to music and visual production.

Advising and Mentoring

- Harsh Verma, (undergraduate) University of Washington, Class of 2019.
 - Masters student at Concordia University.

Service

- Reviewer:
 - International Conference on Learning Representations 2022.
 - IEEE Signal Processing Letters 2022.
 - Transactions of the International Symposium on Music Information Retrieval 2021.
 - International Conference on Machine Learning 2018, 2021, 2022.
 - Advances in Neural Information Processing Systems 2016, 2020, 2021, 2022.
- Panelist:
 - June 2021: Howard University Karsh STEM Scholars Research Panel for Incoming First-Year Students
 - March 2021: UW CSE PhD Student Experience Panel for Admitted Graduate Students
 - February 2020: CSE 142 Careers in Research Panel for First-Year Computer Science Students
- Stanford CS Undergraduate Mentoring, 2021-2022.
 - Undergraduate research mentoring for students from underrepresented backgrounds.

- UW CSE Pre-Application Mentorship Service (PAMS) 2021.
 - Mentored prospective graduate school applicants from historically marginalized groups.
- UW CSE Application Reader, PhD Admissions: 2018, 2019, 2020.
- UW ML Graduate Student Recruiting Activities Coordinator: 2018, 2019.
 - Planned and organized on-campus recruiting events and activities for prospective graduate students.
- UW CSE Graduate Social Co-Chair, 2017.
 - Organized weekly student social events for the Allen School graduate student community.
 - Worked to create inclusive activities that are accessible and appealing to our diverse community of students.
- Co-founder and organizer of the UW Machine Learning and Optimization Reading Group.
 - Organized and scheduled speakers for a weekly seminar for 5 years (2015-2020).
 - In 2020, this seminar grew into the regular meeting of [ADSI](#)/ [IFDS](#), funded by an NSF Tripods grant.

Publications and Preprints

- *Melody Transcription via Generative Pre-Training.*
In International Symposium on Music Information Retrieval (ISMIR) 2022.
Chris Donahue, John Thickstun, Percy Liang.
- *Diffusion-LM Improves Controllable Text Generation.*
Preprint Report, 2022.
Xiang Lisa Li, John Thickstun, Ishaan Gulrajani, Percy Liang, Tatsunori B. Hashimoto.
- *Reconstruction of Visual Images from Murine Retinal Ganglion Cell Spiking Activity using Convolutional Neural Networks.*
Preprint Report, 2021.
Tyler Benster, Darwin Babino, John Thickstun, Matthew Hunt, Xiyang Liu, Zaid Harchaoui, Sewoong Oh, Russell N. Van Gelder.
- *MAUVE: Measuring the Gap Between Neural Text and Human Text using Divergence Frontiers.*
In Advances in Neural Information Processing Systems (Neurips) 2021.
(Outstanding Paper Award: 6 / 9122 paper submissions)
Krishna Pillutla, Swabha Swayamdipta, Rowan Zellers, John Thickstun, Sean Welleck, Yejin Choi, Zaid Harchaoui.
- *Parallel and Flexible Sampling from Autoregressive Models via Langevin Dynamics.*
In International Conference on Machine Learning (ICML) 2021.
Vivek Jayaram, John Thickstun (equal contribution).
- *Faster Policy Learning with Continuous-Time Gradients.*
In Learning for Dynamics & Control (L4DC) 2021.
Samuel Ainsworth, Kendall Lowrey, John Thickstun, Zaid Harchaoui, Siddhartha Srinivasa.
- *Rethinking Evaluation Methodology for Audio to Score Alignment.*
ArXiv Preprint Report 2009.14374, 2020.
John Thickstun, Jennifer Brennan, Harsh Verma.
- *An Information Bottleneck Approach for Controlling Conciseness in Rationale Extraction.*
In Empirical Methods in Natural Language Processing (EMNLP) 2020.
Bhargavi Paranjape, Mandar Joshi, John Thickstun, Hannaneh Hajishirzi, Luke Zettlemoyer.
- *Source Separation with Deep Generative Priors.*
In International Conference on Machine Learning (ICML) 2020.
Vivek Jayaram, John Thickstun (equal contribution).
- *Convolutional Composer Classification.*
In International Symposium on Music Information Retrieval (ISMIR) 2019.
Harsh Verma, John Thickstun.
- *Coupled Recurrent Models for Polyphonic Music Composition.*
In International Symposium on Music Information Retrieval (ISMIR) 2019.
John Thickstun, Zaid Harchaoui, Dean P. Foster, Sham M. Kakade.

- *Invariances and Data Augmentation for Supervised Music Transcription.*
In International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2018.
John Thickstun, Zaid Harchaoui, Dean P. Foster, Sham M. Kakade.
- *Frequency Domain Convolutions for Multiple F0 Estimation.*
MIREX Abstract (Technical Report) 2017.
John Thickstun, Zaid Harchaoui, Dean P. Foster, Sham M. Kakade.
- [MusicNet](#): *Learning Features of Music from Scratch.*
In International Conference on Learning Representations (ICLR) 2017.
John Thickstun, Zaid Harchaoui, Sham M. Kakade.
- *Statistical Inference on Music with Applications to the Transcription Problem.*
Brown University Senior Thesis, 2013.
Supervisor: Eugene Charniak, Computer Science. Second Reader: Hui Wang, Applied Mathematics.

Invited Talks and Presentations

- Classifier-Guided Controllable Text Generation with Diffusion-LM - AI2 - Seattle, WA - 8/3/2022
- Generative Modeling of Classical Western Music - SAIL - Stanford University - 12/4/2020
- Source Separation with Deep Generative Priors - ICML - Vienna, Austria - 7/14/2020
- Convolutional Composer Classification - ISMIR - Delft, Netherlands - 11/6/2019
- Autoregressive Modeling of Musical Scores - ISMIR - Delft, Netherlands - 11/5/2019
- Robust Generative Modeling in Generic Problem Domains - CSE Colloquium - UW Seattle - 10/31/2019
- Neural Music Transcription - ICASSP - Calgary, Canada - 4/18/2018
- MusicNet: Learning Features of Music from Scratch - ICLR - Toulon, France - 4/25/2017
- Automatic Music Transcription - CS Department - Brown University - 5/1/2013
- Introducing the Janus XmlParser - Sirius User Group - St. Louis, Missouri - 5/2/2010
- Tokenization and Collection Objects - Centrelink - Canberra, Australia - 3/23/2010