Chester Holtz

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Interests Machine learning, optimization, data science, signal processing, and deep learning: algorithms and applications

Education

University of California San Diego, La Jolla, CA
PhD in Computer Science, advised by Dr. Chung-Kuan Cheng Expected 2022-2023

University of Rochester, Rochester, NY
B.S. in Computer Science May 2017

Employment

Doctoral Researcher October 2018 -
University of California San Diego, La Jolla, CA
- Analysis of robust neural network classifiers and generative models
- Machine learning & optimization for graph embedding and IC layout design
- Placement algorithms for the Open Road Project (2018-2020)

Quantitative Research Intern, Systematic options alpha June - September 2022
Citadel Securities, Chicago, IL

Machine Learning Intern, GSOC-ML (ML group) June - September 2019
Qualcomm, San Diego, CA
- Hierarchical graph classification

Machine Learning Intern, Intelligent Systems (JHU/APL) June - September 2018
Johns Hopkins University, Applied Physics Laboratory, Laurel, MD
- Improving convergence of networks via decorrelation
- Deep learning-based segmentation and label aggregation algorithms

Research Assistant December 2014 - August 2017
University of Rochester, Rochester, NY
- Statistical and neural machine translation
- Assisted in development of ML framework to recover text from damaged manuscripts
- Developed & implemented algorithms for character segmentation, classification, non-maximum suppression, text correction

Risk and Quantitative Technologies Intern June - August 2016
JP Morgan Chase, New York, NY

Publications

- Chen [et al, incl. **C. Holtz**][1], "*Placement Initialization via Sequential Subspace Optimization with Sphere Constraints*", International Symposium on Physical Design (ISPD), 2023 **(best paper nomination)**.
- **Chester Holtz**, Gal Mishne, and Alexander Cloninger, "*Evaluating Disentanglement in Generative Models Without Knowledge of Latent Factors*", Topology, Algebra, and Geometry in Machine Learning @ ICML, 2022.
- Chen [et al, incl. **C. Holtz**][1], "*Placement Initialization via a Projected Eigenvector Algorithm*", Design Automation Conference (DAC), 2022.
- Cheng [et al, incl. **C. Holtz**][1], "*DAGSizer: A Directed Graph Convolutional Network Approach to Discrete Gate Sizing of VLSI Graphs*", Transactions on Design Automation of Electronic Systems (TODAES), 2022.
- Cheng [et al, incl. **C. Holtz**], "*Machine Learning Prediction for Design and System Technology Co-Optimization Sensitivity Analysis*", VLSI, 2022.
- Cheng [et al, incl. **C. Holtz**][1], "*Net Separation-Oriented Printed Circuit Board Placement via Margin Maximization*", ASP-DAC, 2021 **(best paper award)**.

[1] corresponding author, authors listed alphabetically following convention

- Changhao Shi, **Chester Holtz**, and Gal Mishne, "*Online Adversarial Purification based on Self-supervised Learning*", International Conference on Learning Representations (ICLR), 2021.
- Chung-Kuan Cheng, Chia-Tung Ho, and **Chester Holtz**, "*SPICE*", Encyclopedia of RF and Microwave Engineering, 2021.
- Cheng [et al, incl. **C. Holtz**], "*Design and System Technology Co-Optimization Sensitivity Prediction for VLSI Technology Development using Machine Learning*", Workshop on System Level Interconnect Prediction (SLIP), 2021.
- Lin [et al, incl. **C. Holtz**], "*A Unified Printed Circuit Board Routing Algorithm With Complicated Constraints and Differential Pairs*", ASP-DAC, 2021.
- Park [et al, incl. **C. Holtz**], "*Grid-based Framework for Routability Analysis and Diagnosis with Conditional Design Rules*", IEEE TCAD, 2020.
- Tavenard [et al, incl. **C. Holtz**], "*tslearn, A Machine Learning Toolkit Dedicated to Time-Series Data*", Journal of Machine Learning Research (JMLR), 2020.
- **Chester Holtz**, Onur Atan, Ryan Carey, and Tushit Jain, "*Multi-Task Learning on Graphs with Node and Graph Level Labels*", Workshop on Graph Representation Learning @ NeurIPS, 2019.
- Po-Ya Hsu, **Chester Holtz**, "*A Machine Learning-based Approach to Early Detection of Sepsis From Clinical Data*", Computing in Cardiology, 2019.
- **Chester Holtz**, Chuyang Ke, and Daniel Gildea, "*University of Rochester WMT'17 Neural Machine Translation System*", Conference on Statistical Machine Translation, 2017.
- Jianbo Yuan, **Chester Holtz**, Tristam Smith, and Jiebo Luo, "*Autism Spectrum Disorder Detection from Semi-structured and Unstructured Medical Data*", Eurasip Journal on Bioinformatics and Systems Biology, 2017.

Preprints

- **Chester Holtz**, Pengwen Chen, Alexander Cloninger, Chung-Kuan Cheng, and Gal Mishne "*Revisiting Semi-Supervised Laplacian Eigenmaps via Alignment*", in submission.
- Pengwen Chen, Chung-Kuan Cheng, and **Chester Holtz**, "*Minimizing a quadratic over Stiefel manifolds*".
- **Chester Holtz**, Yucheng Wang, Chung-Kuan Cheng, and Bill Lin, "*Evaluating Robustness and Generalization of ML-Based Congestion Predictors to Valid and Imperceptible Perturbations*", in submission.
- **Chester Holtz**, Tsui-Wei Weng, and Gal Mishne, "*Learning Sample Reweighting for Accuracy and Adversarial Robustness*", arXiv:2210.11513, 2022.
- **Chester Holtz**, Changhao Shi, and Gal Mishne, "*Provable Robustness by Geometric Regularization of ReLU Networks*".
- **Chester Holtz**, Vignesh Gokul, "*Early Forecasting of Quakes via Machine Learning*", tech. report.
- Hector Cardenas, **Chester Holtz**, Maria Janczak, Philip Meyers, and Nathaniel Potrepka, "*A Refutation of the Clique-Based P = NP Proofs of LaPlante and Tamta-Pande-Dhami*", arXiv:1612.06830, 2015.

Presentations

- DeepMath, "*Evaluating Disentanglement in Generative Models Without Knowledge of Latent Factors*", San Diego, CA, 2023.
- Citadel Securities, "*Adversarial Examples & Provable Robustness on Graph-Structured Data*", Chicago, IL, 2022.
- DAC, "*Placement Initialization via a Projected Eigenvector Algorithm*", San Francisco, CA, 2022.
- ASP-DAC, "*Net Separation-Oriented Printed Circuit Board Placement via Margin Maximization*", Remote, 2021.
- UC San Diego Optimization and Data Science Seminar, "*Adversarial Examples & Provable Robustness*", San Diego, CA, 2021.
- NeurIPS Workshop on Graph Representation Learning, 2019, "*Multi-Task Learning on Graphs with Node and Graph Level Labels*", Vancouver, Canada, 2019.

- Second Conference on Machine Translation (WMT17), "*University of Rochester WMT'17 NMT System Submission*", Copenhagen, Denmark, 2017.

Professional Service

Program Committee Member & Reviewer

- QEAPE (2018), EMNLP (2018, 2019, 2020), ACL (2018, 2019), AAAI (2020-2022), NeurIPS (2022)

Teaching Experience

Teaching assistant

• Convex Optimization Theory and Algorithms	UCSD, Fall 2020-2023
• Digital Logic	UCSD, Fall 2020-2022
• Statistical AI	UCSD, Fall 2020
• Computational Probability and Statistics	UCSD, Fall 2018
• Mathematics for Algorithms and Analysis	UCSD, Spring 2018
• Recommender Systems and Web Mining	UCSD, Fall 2017
• Machine Learning	UR, Spring 2017
• Data Mining	UR, Fall 2016, Spring 2017
• Artificial Intelligence	UR, Spring 2016
• Data Structures and Algorithms	UR, Fall 2016
• Intro. to Computer Science	UR, Spring 2016
• Intro. to Programming	Fall 2015
• Intro. to Probability	UR, Fall 2015 - Spring 2016
• Discrete Mathematics	UR, Fall 2015 - Spring 2016

Academic mentor

- UCSD Undergraduate: Aoxi Li (UCLA MS) (2 publications)
- UCSD MS: Yucheng Wang (UCSD PhD) (2 publications)

Open Source Projects

banditpylib `https://github.com/Alanthink/banditpylib`

A lightweight python library for bandit algorithms

- Implemented decentralized, stochastic linear/correlated bandits environments and algorithms

tslearn `https://github.com/rtavenar/tslearn`

A Python machine learning toolkit dedicated to time-series data [in JMLR'20]

- Improved progress reporting and data infrastructure
- Introduced support for Gaussian process regression

Honors

- Best paper award, ISPD 2023
- Best paper award, ASP-DAC 2022
- Dean's Scholarship, University of Rochester
- 1st place in data science at DandyHacks, University of Rochester, 2016

Skills

- *Languages:* Python, Matlab, Java, R, SQL, Javascript, C/C++, Julia
- *Frameworks:* Jax (numpy,scipy,cvxpy,matplotlib), PyTorch, TensorFlow, Keras

Other

- Teaching, open source science student evaluations
- Science fiction lit., cooking
- Tennis, snowboarding, swimming, hiking / backpacking