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Hugh Chen

http://hughchen.github.io/

Curriculum Vitae

Education

PhD Computer Science	University of Washington	2018 - 2022
MS Statistics	University of Washington	2016 - 2018
BS Computer Science	University of California, Berkeley	2012 - 2016

Work Experience

Uber Machine Learning Engineer November 2022 - Present

- Experimented with methods to embed time series data including fixed feature extractors, PCA, and deep autoencoders.
- Engaging with the internal machine learning platform team to provide guidance and help design plans for explainable artificial intelligence at Uber.
- Implementing production quality forecasting models used to create earner incentives.

Google Software Engineer Intern Summer 2021

- Comprehensively reviewed literature, implemented, and tested a variety of approaches for sample level attribution using training dynamics including TracIn and Dataset Cartography.
- Proposed, designed, and created a tool for tractable explanation of tree-based models using Shapley value local feature attributions.

University of Washington Research Assistant 2016-2022

- Advised by Professor Su-In Lee. Worked on the application of machine learning to healthcare and development of explainable AI techniques.
- Created methods for Shapley value local feature attribution, including a tractable method for tree models, solving an NP-hard problem in linear time via dynamic programming.
- Created self-supervised time series embedding models for physiological signals using long short term memory networks in operating room data.

University of Washington Teaching Assistant Spring 2022

- Co-created and taught one of the first courses on Explainable Artificial Intelligence. Topics include feature attributions, counterfactual explanations, and example attributions.
- Responsibilities included co-creating the course (syllabus, lectures, and homework), presenting lectures, hosting office hours, and grading homework.

Selected Publications

- Chris Lin*, **Hugh Chen***, Chanwoo Kim, and Su-In Lee. "Contrastive Corpus Attribution for Explaining Representations." *ICLR,* 2023.
- **Hugh Chen***, Ian C. Covert*, Scott M. Lundberg, and Su-In Lee. "Algorithms to estimate Shapley value feature attributions." *Nature Machine Intelligence,* 2023.
- **Hugh Chen**, Scott M. Lundberg, and Su-In Lee. "Explaining a series of models by propagating Shapley values." *Nature communications,* 2022.
- Wei Qiu, **Hugh Chen**, Ayse Berceste Dincer, Scott Lundberg, Matt Kaeberlein, and Su-In Lee. "Interpretable machine learning prediction of all-cause mortality." *Communications Medicine,* 2022.
- **Hugh Chen**, Scott M. Lundberg, Gabriel Erion, Jerry H. Kim, and Su-In Lee. "Forecasting adverse surgical events using self-supervised transfer learning for physiological signals." *NPJ Digital Medicine,* 2021.
- **Hugh Chen***, Joseph D. Janizek*, Scott Lundberg, Su-In Lee. "True to the Model or True to the Data?." *ICML Workshop on Human Interpretability,* 2020.
- Scott M. Lundberg, Gabriel Erion, **Hugh Chen**, Alex DeGrave, Jordan M. Prutkin, Bala Nair, Ronit Katz, Jonathan Himmelfarb, Nisha Bansal, and Su-In Lee. "From local explanations to global understanding with explainable AI for trees." *Nature machine intelligence,* 2020.
- **Hugh Chen**, Scott M. Lundberg, and Su-In Lee. "Checkpoint ensembles: Ensemble methods from a single training process." arXiv preprint arXiv:1710.03282 (2017).
- **Hugh Chen**, Yusuf Erol, Eric Shen, and Stuart Russell. "Probabilistic model-based approach for heart beat detection." *Physiological Measurement, 2016*.

Selected Open Source

Interventional Tree Explainer (https://github.com/slundberg/shap)

Created, implemented, and optimized (C++ and Cython) the default algorithm to explain tree models (decision trees, random forests, and gradient boosted trees), which is one of the most popular methods in the widely used SHAP package (15.6k Github stars) [Article]

QR Image (https://github.com/hughchen/qr_image)

Client-side javascript web app to turn images into valid QR codes (446 Github stars) [Website]

Honors

- Recipient of NSF Graduate Research Fellowship
- NeurIPS Machine Learning for Health Workshop Travel Award
- High Distinction in General Scholarship at University of California, Berkeley
- President of CS Honors Society (UPE) at University of California, Berkeley
- EECS Honors Program at University of California, Berkeley