Hayden McTavish
Durham, NC 27705 | 206-883-3199 | hayden.mctavish@duke.edu

Education/ Academic Achievement

Duke University   2023 – present
PhD Student in Computer Science   (GPA: 4.0/4.0)

University of California, San Diego   2021 – 2023
MS in Computer Science and Engineering   (GPA: 4.0/4.0)

University of British Columbia   2016 – 2021
BS in Computer Science and Statistics   (GPA: 4.0/4.0)

Relevant Experience:

- **Graduate Student Researcher**   August 2023 – Present
  Duke University
  - Led a research project on interpretable machine learning for missing data through completion and acceptance to a top venue, Neurips '24.
  - Designed novel algorithms for decision tree optimization to reliably sample from the set of near-optimal solutions in just a few seconds

- **Graduate Student Researcher**   September 2021 – August 2023
  University of California, San Diego
  - Designed, led, and published an intersectional analysis of student engagement and anonymity in online course discussion forums - Piazza and Ed Discussion.
  - Collected, analyzed, and documented data from 8 courses and 1600 students, sourcing from the university registrar, a survey, and two different course discussion platforms.
  - Presented the publication at a premier Computing Education conference, ICER.
  - Innovated a novel, efficient framework for aggregating human preferences, bridging the disciplines of social choice, fairness in machine learning, and algorithm design.

- *Research Assistant*   *May 2019 – February 2021*
  University of British Columbia
  - Led a research investigation, from initial concepts to accepted publication, by closely collaborating with a large multi-institutional team.
  - Proved bounds for a novel approach to decision tree optimization
  - Designed and implemented a scalability improvement to a state-of-the-art method for finding Bayesian coresets, weighted subsets of data for fast and accurate inference.

Selected Publications

- [Interpretable Generalized Additive Models for Datasets with Missing Values](), Neurips, 2024. ([video]()) | Hayden McTavish*, Jon Donnelly*, Margo Seltzer, Cynthia Rudin
- [Fast Sparse Decision Tree Optimization via Reference Ensembles](), AAAI, 2022. [(video teaser)]() | [(talk)]() | [(code)]() | Hayden McTavish*, Chudi Zhong*, Reto Achermann, Ilias Karimalis, Jacques Chen, Cynthia Rudin, Margo Seltzer
- Selective Preference Aggregation, Neurips 2024 Workshops in Pluralistic Alignment, Behavioral ML. Shreyas Kadekodi*, Hayden McTavish*, Berk Ustun.
- Sparse Decision Tree Learning with Thoughtful Use of Optimal and Greedy Strategies, in submission. Varun Babbar*, Hayden McTavish*, Margo Seltzer, Cynthia Rudin.

- [Engagement and Anonymity in Online Computer Science Course Forums](#), ICER, 2023. [(slides)](#) | Mrinal Sharma*, Hayden McTavish*, Zimo Peng, Anshul Shah, Vardhan Agarwal, Caroline Sih, Emma Hogan, Ismael Villegas Molina, Adalbert Gerald Soosai Raj, Kristen Vaccaro
  *co-first authors

Honors & Awards
- 2024 Duke Research Initiation Project award (given to the top two students presenting original research at Duke's version of a qualifying examination)
- 2023 Cultural Competency in Computing (3C) fellow – two-year international professional development program tackling systemic bias in AI and academia.
- 2021 Award for Academic Excellence in Computer Science (given to the top graduating student of the Combined Major in Computer Science and Statistics)
- 2019 NSERC Undergraduate Student Research Award
- 2019 Dr. John and Barbara PETKAU scholarship (given to the top 3rd year UBC student in a statistics-related major)
- 2020 UBC Charles and Jane Banks Scholarship (institutional academic merit award)
- 2019 UBC Greer Family Scholarship (institutional academic merit award)
- 2019 UBC Shirley Snelgrove & John Yule scholarship (institutional academic merit award)
- 2018 UBC Marie Kendall Memorial Scholarship in Science (institutional academic merit award)
- 2018, 2020 UBC Computer Science Scholarship (institutional academic merit award)
- 2018, 2019, 2020 Trek Excellence Scholarship for Continuing Students (award for top 5% of continuing UBC students)
- 2017, 2018 UBC David Shum Memorial Prize in Computer Science (institutional academic merit award)
- 2013 Pokémon Scholarship (award for winning the Senior Division Video Game World Championships)

Teaching Experience:

- ***Teaching Assistant***   ***September 2022 – June 2023***
  University of California, San Diego
    o Facilitated discussions on the impact of social computing policies and algorithms.
    o Maintained, evaluated, and encrypted proofs for applied cryptography
    o Led a tutorial guiding students to develop AI solutions for 2048, leveraging my experience in search and optimization.
- ***Teaching Assistant***   ***September 2018 – April 2020***
  University of British Columbia
    o Clearly communicated statistics and data science concepts to non-experts while running tutorials, labs, and office hours for students in introductory courses.
    o Fostered effective and welcoming learning environments for statistics by placing an emphasis on sharing my own enthusiasm for the subject, and regularly encouraging questions from my students.