Jonathan Huml

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Education

- **Columbia University** 2024-present
  Statistics (Ph.D.)
- **Harvard University** 2021-2023
  Master's in Computational Science and Engineering (M.E.), GPA: 4.0
  Thesis (supervised by Dr. Demba Ba): Geometry-Aware Sparse Coding
- **University of North Carolina-Chapel Hill** 2016-2020
  Mathematics (B.A.), Statistics (B.S.), GPA: 3.7
  Thesis (supervised by Dr. Michael Aguilar): Nonparametric Markowitz Optimization

Experience

- **Mortimer B. Zuckerman Mind-Brain Behavior Institute** 2024
  Research Staff Assistant
  - **Research**: Scaling state-space models with computational and statistical uncertainty quantification
  - **Lab Duties**: Software engineering, writing and submitting work
- **Computation, Representation, and Inference in Signal Processing Group @ Harvard** 2021-2023
  Research Assistant
  - **Research**: Deep learning theory and programming, especially PyTorch with CUDA
  - **Lab Duties**: Presenting research papers during group meetings, preparing slides for personal meetings with principal investigator (Dr. Demba Ba), writing and submitting publications
- **Drug Information Association Adaptive Design Scientific Working Group** 2020-2021
  Research Associate
  - **Research**: Formulate a patient-centered statistical basis for regulatory guidance when designing adaptive clinical trials. Our work culminated in a book chapter (see publications)
- **IQVIA** 2019
  Data Science Intern
  - **Project**: Text analysis program to automate quality report classification
  - **Tasks**: Build an application to allow users to upload documents and route quality assurance reports to the correct departments with machine learning (using `Keras`)
- **Grant Lab @ North Carolina State University** 2019-2020
  Undergraduate Researcher
  - **Project**: Build an autonomous wheelchair
  - **Tasks**: In contrast to work at UNC, this work was much more software focused. Used Raspberry Pi and `TensorFlow` framework for neural computer vision tasks
- **UNC Makerspace and Machine Shop** 2017 - 2019
  Builder
  - **Project**: Budgeted, managed a project to build a high performance, low-cost wheelchair
  - **Tasks**: Build hardware systems (motors, boards, etc.), write software for microcontrollers, implement computer vision algorithms to make the wheelchair capable of detecting and avoiding objects

Workshop and Conference Papers

1. **JR Huml**, W. Pan, F. Doshi-Velez. "Which Off-Policy Evaluation (OPE) Method, and When?" *Reinforcement Learning at Harvard*. 2022.
2. **JR Huml**, A. Tasissa, D. Ba. "Local Geometry Constraints in V1 with Deep Recurrent Autoencoders." *Shared Visual Representations in Human & Machine Intelligence (NeurIPS)*. 2022.
3. **JR Huml**, A. Tasissa, D. Ba. "Sparse, Geometric Autoencoder Models of V1." *Symmetry and Geometry in Neural Representations (NeurIPS)*. 2022.
4. **JR Huml**, A. Tasissa, D. Ba. "Clustering Inductive Biases with Unrolled Networks." *Computational and Systems Neuroscience (COSYNE)*. 2023.
5. **JR Huml**, Jonathan Wenger, JP Cunningham. "Computation-Aware State-Space Models." *Statistical Analysis of Neural Data (SAND)*. 2025.

Journal Publications

1. Z. Antonijevic, RA Beckman, **JR Huml**, Y. Liu, C. Mayer, G. McMillan, RS Tang. "Patient Benefits from Innovative Designs in Rare Diseases." *Rare Disease Drug Development*. Springer. 2021.

2. RA Huml, J. Dawson, M. Bailey, N. Nakas, J. Williams, M. Kolochavina, **JR Huml**. "Accelerating Rare Disease Drug Development: Lessons Learned from Muscular Dystrophy Patient Advocacy Groups." *Therapeutic Innovation & Regulatory Science*. 2021.

3. RA Huml, J. Dawson, K. Lipworth, L. Rojas, EJ Warren, C. Manaktala, **JR Huml**. "Use of Big Data to Aid Patient Recruitment for Clinical Trials Involving Biosimilars and Rare Diseases." *Therapeutic Innovation & Regulatory Science*. 2020.

Invited Talks

1. "The Ripple Effect." *Kempner Institute for the Study of Artificial and Natural Intelligence Launch Event.* Harvard University. September 2022.

2. "Topography of the Primary Visual Cortex." *Kanwisher Lab.* Massachusetts Institute of Technology. November 2022.

Teaching

- **Teaching Assistant**: Advanced Machine Learning (F24), Interpretable Machine Learning (S25)

Academic Service

- **Reviewer**: Shared Visual Representations in Human & Machine Intelligence (NeurIPS Workshop)
- **Reviewer**: Symmetry and Geometry in Neural Representations (NeurIPS Workshop)

Honors and Awards

- **Harvard IACS Student Scholarship (2022)**: Awarded for top master's thesis proposals
- **NC Summer Scholarship (2020)**: Awarded for mathematics studies and research at UNC-CH
- **Eagle Scout**: Earned the highest Boy Scouts of America rank at age 13, making me the youngest out of the 40 Eagles awarded in Troop 424's history

Skills Summary

- **Languages**: `Python` (Pytorch, any scientific computing package, Django framework), `Matlab`, `HTML/CSS`
- **Sample of courses**: Real Analysis I & II, Differential Geometry, Mathematical Statistics, Numerical Analysis, Neural Computation, Stochastic Modeling, Sequential Decision Making, Data Science, Scientific Programming, Differential Privacy