Blake Martin

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EDUCATION

University of Michigan | Ann Arbor, MI | 4.00/4.00 GPA   Expected Graduation: May 2021
B.S.E. in Data Science with Mathematics Minor

- Deep Learning for Computer Vision (EECS 498)
- Introduction to Machine Learning (EECS 445)
- Data Structures and Algorithms (EECS 281)
- Conversational AI (EECS 498)
- Linear Regression (STATS 413)
- Numerical Methods (MATH 471)

RESEARCH EXPERIENCE

Publications and Manuscripts
- "An Inverse Modelling Study on the Local Volume Changes During Early Growth of the Fetal Human Brain." *Brain Multiphysics*. (Revise and Resubmit)
- "Machine Learning Can Identify Abnormal Chromosomes to Facilitate Initial Screening in the Cytogenomics Laboratory" [Abstract]. *College of American Pathologists (CAP20)*. September 2020.

Computational Physics Group Research (University of Michigan)   October 2018 – Present
- Developed 3D Convolutional Neural Networks that predict effective diffusivity of microstructures in batteries given volumetric image representations
- Implemented gradient descent and physics-based L-BFGS-B optimization to analyze MRI scans and model mechanics that govern brain folding in development
- Integrated Open MPI for parallel computation on high performance computing clusters

CytogeneticsAI Research (Beaumont Health System – Royal Oak)   April 2019 – Present
- Created a Convolutional Neural Network model that can predict between eight classes of normal and abnormal chromosomes associated with myeloid leukemia at 94% accuracy
- Implemented k-means clustering to extract individual chromosome pairs from karyotype images

WORK EXPERIENCE

ML Instructional Aide (EECS 445) | University of Michigan   September 2020 - Present
- Lead discussions, design assignments, and provide help in office hours regarding ML concepts
- Provide solutions to new accessibility challenges posed by the virtual semester
- Instruct on topics including SVMs, neural networks, decision trees, boosting, and clustering

ML Algorithms Intern | KLA   June 2020 – August 2020
- Performed self-supervised representation learning with autoencoders and simCLR in TensorFlow
- Developed algorithms that produce encodings of large images 3x faster than with previously used methods in transfer learning tasks while maintaining downstream predictive power

Advanced Engineering Intern | Gentherm   May 2019 – August 2019
- Extracted accurate predictions of occupant weight, height, gender, and clothing insulation from their car seat pressure distribution using scikit-learn while reducing sensor area required by 98%
- Visualized statistics and time dependencies of participant sensation, thermal comfort, and reported uncomfortable body parts from test drive data with Python's Pandas and Matplotlib libraries

SKILLS

Programming Languages: Python, C++, R, SQL, MATLAB
ML and Data Mining Libraries: PyTorch, TensorFlow, scikit-learn, OpenCV, NumPy, Pandas, Matplotlib
Technical Proficiencies: VS Code, WSL, Git, Jupyter Notebooks, Azure DevOps