

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)
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RESEARCH EXPERIENCE

Publications and Conference Papers

- "An Inverse Modelling Study on the Local Volume Changes During Early Growth of the Fetal Human Brain." *Brain Multiphysics*. (Revised and Resubmitted)
- "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
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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
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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