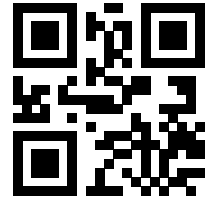


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Matt Raymond
ML, BioChem, Inverse Design



Education	University of Michigan <i>Ph.D. ECE: Signal/Image Processing & Machine Learning</i> GPA: 3.93 <ul style="list-style-type: none">• Co-advised by Dr. Clayton Scott and Dr. Angela Violi• Thesis Topic: <i>Inverse Design of Nanoparticles from Small Datasets</i>	Ann Arbor, MI 08/22–04/26
	University of Michigan <i>M.Sc. Computer Science</i> GPA: 3.91 <ul style="list-style-type: none">• Member of the VioliGroup computational biochemistry lab (3 semesters, 2 summers)• President of the Machine Learning Theory Reading Group, 1 semester	Ann Arbor, MI 08/20–04/22
	Chapman University <i>B.Sc. Computer Science, Music Minor</i> GPA: 3.86 <ul style="list-style-type: none">• Member of the Provost List, 8 semesters• Recipient of the Chancellor's Scholarship, 8 semesters• Tutor and Supplemental Instructor for Computer Science and Math, 4 semesters	Orange, CA 08/16–05/20
Papers	Domain-Agnostic Predictions of Nanoscale Interactions in Proteins and Nanoparticles 04/2023 <i>Nature Computational Science</i> <ul style="list-style-type: none">• Developed NeCLAS, a framework for predicting generalized nanoscale interactions• Implemented permutation-invariant Neural Network using Tensorflow (TF)• Migrated competitors code from TensorFlow (TF) 1 to TF 2 for testing• Paper currently in Proof stage. Code: doi.org/10.24433/CO.8157811.v1	
Work Experience	Directed Study & Summer Research <i>Dr. Scott and Dr. Violi</i> <ul style="list-style-type: none">• Performed novel research in generalized molecular representations• Advised computational biochemists on machine learning methodology and literature• Supervised student researchers; Geometric Deep Learning and Deep Gaussian Processes	01/21–09/22
	Instrument Programmer <i>Lotus Instruments</i> <ul style="list-style-type: none">• Developed controls for government-contracted, custom gas chromatography instruments• Analyzed documentation to create custom libraries for serial data transfer	Long Beach, CA 09/19–11/19
	Software Engineering Intern <i>Toyoda Gosei</i> <ul style="list-style-type: none">• Saved 2,000 man-hours and \$60,000 per year through automated purchase order tracking• Implemented a web-based asset tracking software using full-stack ASP.NET• Collaborated with Cost Management to solidify requirements and return on investment	Troy, MI 05/19–08/19
Projects	The Implicit Bias of Gradient Descent on Separable Multiclass Data <i>U-M Course: EECS 598, 559</i> <ul style="list-style-type: none">• Developed a conjecture for extending existing work to include certain groups of multiclass losses• Showed numerically that our conjecture holds for certain well-known loss functions• Currently working on a proof for this general case	Ann Arbor, MI 12/22, 05/23
	Real-Time Distributed Learning in Connected & Autonomous Vehicles (CAVs) <i>U-M Course: EECS 571</i> <ul style="list-style-type: none">• Designed distributed learning protocol for sparse gradient propagation• Implemented simulated learning environment in Tensorflow	Ann Arbor, MI 12/21

- Demonstrated superior generalization, with fewer assumptions than Federated Learning

Domain Exploration Through Artificial Curiosity

Ann Arbor, MI

U-M Course: EECS 545

12/20

- Developed simulated Martian terrain as a domain
- Beginning with Shmidhuber's theoretical basis for artificial curiosity, developed an implementation using convolutional auto-encoders
- Defined heuristic "Explorational Value" for evaluating path explored by model
- Performed evaluation against naive models to illustrate effectiveness of artificial curiosity

Needlecast: On-the-Fly Reconfiguration of Spacecraft Flight Software

Ann Arbor, MI

U-M Course: EECS 587

12/20

- Collaborated with NASA staff to draft specifications for protocols
- Designed a library for booting NASA core Flight System (cFS) applications on-the-fly
- Implemented Needlecast as a plug-and-play header file for NASA core cFE
- Developed a simulated network switch and web interface for straightforward debugging

AI-Driven Contemporary Archaeology for The International Space Station

Orange, CA

U-M Course: EECS 587

01/20

- Analyzed project requirements with Dr. Walsh (co-PI of ISS Archeology)
- Compiled facial training dataset for 240 ISS astronauts
- Utilized convolutional neural networks to label astronauts' faces in NASA photo archives