MICHAEL NEUDER

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EDUCATION

Harvard University 2020 - 2022
ME in Computational Science and Engineering *Cambridge, MA*

University of Colorado, Boulder 2015 - 2020
BA in Computer Science, BA in Mathematics *Boulder, CO*

University of Oxford 2018
Visiting Student *Oxford, UK*

RESEARCH EXPERIENCE

EconCS Group, Harvard University August 2019 - December 2019
Research Assistant under supervision of Dr. David C. Parkes and Daniel Moroz *Cambridge, MA*

- Examined known incentive flaws in the Proof-of-Work consensus mechanism with classical and deep reinforcement learning algorithms.
- Discovered incentive vulnerabilities in the recently updated Proof-of-Stake protocol used by Tezos.

Santa Fe Institute June 2018 - August 2018
Undergraduate Research Fellow: Summer 2018 REU *Santa Fe, NM*

- Leveraged computer vision and machine learning algorithms to attempt to extract animal trajectories from drone footage despite camouflage and small animal size.
- Studied the research space of object tracking and image segmentation using software packages including YOLO, Mask RCNN, and Faster RCNN.

Bradley Lab, University of Colorado April 2017 - Present
Research Assistant under supervision of Dr. Elizabeth Bradley *Boulder, CO*

- Collaborated with an interdisciplinary research group to analyze high-resolution water isotope data collected from polar ice cores using information theory.
- Developed and maintained the codebase for the processing, analysis, and visualization of our data.

Mozer Lab, University of Colorado March 2017 - Present
Research Assistant under supervision of Dr. Michael Mozer *Boulder, CO*

- Implemented deep neural networks to analyze information content of text and predict human reading time with the goal of use in automated scrolling systems.
- Trained convolutional neural networks to evaluate image quality based on computer vision metrics (mainly Multi-Scale Structural Similarity).

INDUSTRY EXPERIENCE

Google May 2020 - August 2020
Software Engineering Intern – Cloud *Madison, WI*

- Incoming intern in cloud infrastructure.

Google May 2019 - August 2019
Software Engineering Intern – Flights *Cambridge, MA*

- Built and deployed a server that held internal airline data to be queried with a remote procedure call, which reduced cumulative data retrieval time by at least 50%.
- Created a multi-threaded SQL engine that improved query response time by $10x$ by returning results concurrently with iterating the remaining rows of the table.

Google September 2018 - December 2018
Software Engineering Intern – G Suite *Sunnyvale, CA*

- Built an automated system that collects data, trains a machine learning model, and deploys the model to an internal recommendation server.
- Integrated natural language processing and clustering algorithms into the Mobile Device Management system on the G Suite Platform.

Lockheed Martin & Laboratory of Atmospheric and Space Physics Feb 2017 - Oct 2017
Software Engineering Intern *Boulder, CO*

- Created user-friendly graphical interfaces using the Qt and ncurses frameworks in Python and C++.
- Developed automated graphical application test suites using the EggPlant Functional software and SenseTalk language.

PUBLICATIONS

- **M. Neuder**, D. J. Moroz, R. Rao, D. C. Parkes, "Selfish Behavior in the Tezos Proof-of-Stake Protocol," *Cryptoeconomic Systems (CES) Conference 2020*. https://arxiv.org/pdf/1912.02954.pdf.
- J. Garland, T. Jones, **M. Neuder**, J. W. C. White, E. Bradley, "An information-theoretic approach to extracting climate signals from deep polar ice cores," *Chaos: An Interdisciplinary Journal of Nonlinear Science* **29**:101105 (2019). https://doi.org/10.1063/1.5127211.
- J. Garland, T. Jones, **M. Neuder**, V. Morris, J. W. C. White, E. Bradley, "Anomaly Detection in Paleoclimate Records using Information Theory," *Entropy* **20**(12):931 (2018). https://arxiv.org/pdf/1811.01272.pdf.
- **M. Neuder**, M. Mozer, "Image Evaluation Using Deep Learning," *Colorado Journal of Applied Mathematics* **Fall 2018 Edition**:43-54 (2018).

AWARDS

- **2019-2020**. *Sieglinde Talbott Haller Scholarship in Mathematics.* Given to high performing Math majors at the University of Colorado.
- **2019**. *Honorable Mention: Computing Research Association Outstanding Undergraduate Researcher Award.* Nominated by Dr. Liz Bradley.
- **2017**. *Phi Beta Kappa.* Elected junior year for completing 100 credit hours with a GPA greater than 3.7.
- **2015-2020**. *President Joseph A. Sewall Esteemed Scholar Award.* Merit-based scholarship given to Colorado residents.
- **2015-2020**. *Dean's List.* Earned for achieving a GPA of 3.75 or greater as a full-time student.

TECHNICAL STRENGTHS

Languages	C++11, Python, Perl, Java, MATLAB, R
Tools	git, TensorFlow, Keras, gRPC, protocol bufffers, Linux, Jupyter, LaTeX, CUDA

ADDITIONAL

Club involvement	Data Science Team, Math club, Mansfield College Rowing (Oxford, UK)
Interests	rock climbing, skiing, chess, ultimate frisbee, reading, mandolin