MICHAEL NEUDER

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EDUCATION

University of Colorado, College of Arts and Sciences 2015 - 2020
Bachelor's in Computer Science, Bachelor's in Mathematics *Boulder, CO*

- Overall GPA: 3.85/4.0
- Computer Science GPA: 3.97/4.0
- Senior Thesis (*tenative title*): Image quality evaluation using deep learning.

University of Oxford, Mansfield College 2018
Visiting Student *Oxford, UK*

- Coursework in Statistics, Probability, Macroeconomics, and Numerical Analysis.
- Visited for Hilary and Trinity terms (January - June).
- Averaged First Class marks.

RESEARCH EXPERIENCE

Parkes Lab, 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.
- Explored 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*

- Created algorithms to extract animal trajectories from drone footage under the challenge of small animal size and camouflage with background.
- Explored the research space of object tracking 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 nets to analyze information content of text and predict human reading time with the goal of use in automated scrolling systems.
- Created convolutional neural network architectures 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 computing 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.

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

- Built an automated pipeline that collects data, trains a machine learning model, and deploys the model to an internal recommendation server.
- Integrated natural language processing 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 applications using the Qt and ncurses frameworks in Python and C++.
- Developed automated graphical application testing suites using EggPlant Functional software and the SenseTalk language.

PUBLICATIONS

- **M. Neuder**, D. J. Moroz, R. Rao, D. C. Parkes, "Selfish Behavior in the Tezos Proof-of-Stake Protocol," submitted, *Cryptoeconomic Systems (CES) Conference 2020*. https://arxiv.org/abs/1912.02954.
- 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://arxiv.org/abs/1806.10936.
- 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/abs/1811.01272.
- **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 in the 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 during a full time semester.

TECHNICAL STRENGTHS

Languages	C++11, Python, Perl, Java, MATLAB, R
Frameworks	git, TensorFlow, Keras, gRPC, protocol bufffers, Linux, Jupyter, LaTeX, CUDA
Techniques	dependency injection, multithreading, object-oriented programming, factory methods

ADDITIONAL

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