NOAH GRAYSON LUNA

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SUMMARY OF QUALIFICATIONS

Recent M.S. Graduate from Top-tier University with experience developing and implementing Deep Neural Networks, processing and handling time-series data, developing algorithms, high performance computing, scientific analysis, international collaborative research, and professional work-experience at a renowned Seismological Laboratory. Seeking opportunities to propel data-driven research using various Machine Learning models, implement new algorithms for computer efficiency, and master software used for industry in a collaborative environment. **Developed Understanding in:**

Machine Learning · Deep Neural Networks · Transfer Learning · Python · Pandas · TensorFlow · Keras
Version Control · Processing Data · Time-Series Data · Data Analysis · Scientific Programming
Quick Learner · Team Player · Self-motivated · Communication

EDUCATION

Master of Science in Geophysics Graduated: August 2019
Joint degree from Ludwig-Maximilians-University &
Technical University of Munich

Bachelor of Arts in Geophysics Graduated: December 2014
University of California, Berkeley

PROFESSIONAL EXPERIENCE

Assistant Scientist, Ludwig Maximilians University 01.2018 – 01.2019

Machine Learning Speaker for Munich Earth Science School Conference

- Presented a talk and held a Python Jupyter Notebook programming session on recurrent neural networks to professors, post-docs, and Ph.D students from around the world.
- Developed Jupyter Notebooks on Recurrent Neural Networks for programming session.

Student Aid - Earthquake Rupture Simulation of the ’94 NorthRidge Event on HPCs

- Ran simulations using pre-existing mesh, velocity, and rupture parameters using SiesSol software on high performance computers.
- Analyzed synthetics created from simulation with real recorded strong ground motion data.
- Based on discontinuous Galerkin method. We took advantage of tetrahedral elements of varying sizes in order to handle complex geographic geometries.

Research Associate, UC Berkeley Seismology Lab 25.06.2015-21.09.2017

Provided immediate support to IT, Operational, and Engineering Staff of the Berkeley Seismological Laboratory and its various seismic networks. Aided in web development tasks.

Seismic Data Analysis

- Provided timely and accurate information to state and federal agencies, media, and the public by reviewing results for fit and robustness of the automated moment tensors produced by the lab.
- Remotely re-centered and calibrated inertial masses of Streckeisen Broadband Seismometers (STS-1 and STS-2).

Berkeley Seismological Laboratory Website

- Developed web pages for the Berkeley Seismology Lab.
- Updated and created new webpage for the California Integrated Seismic Network (CISN) using Bootstrap library framework.

ONGOING MACHINE LEARNING WORK

Denoising Seismic Data with Deep Neural Network Autoencoders

Improve the signal to noise ratio (SNR) of broadband seismic stations in Germany using a Deep Learning approach.

- Seismic (time-series) data is contaminated with noise from traffic, Earth tides, pressure variations, etc. It is common practice to apply filters. However, filters can remove relevant information from the signal.
- This is where Deep Learning might help. We are using denoising autoencoder architectures (i.e. Convolutional Neural Networks) and Transfer Learning (we are training on data from California first).

Collaborator: Dr. Qingkai Kong, Assistant Data Science Researcher at UC Berkeley Seismology Lab & Berkeley Divisions of Data Science

Single Station Location with 4 DoF Seismometers with Convolutional Neural Networks

Identify phase arrivals found in recorded time-series recordings for future single station earthquake locations.

- Our data set consists of rotational and translational motions (6 Degrees of freedom). 6Dof can be used to earthquakes using a single seismic station.
- Dataset consists primarily of synthetic waveforms generated by an online database of source functions.
- Given the success in their in the field of computer vision and time-series data, we chose CNN.

Collaborator: Dr. Heiner Igel, Professor of the Department of Earth and Environmental Sciences Ludwig-Maximilians-University

PUBLIC SPEAKING/SEMINAR TALKS ON ML

"Applications of Deep Neural Networks in Seismology" 23.07.2019
Master Thesis Defense, Ludwig Maximilian University of Munich

"Recurrent Neural Networks: The Why, What, and How?" 17-22.02.2019
Munich Earth Science School hosted by the Ludwig Maximilian University of Munich.

"Deep Neural Networks and Seismology" 05.12.2018
Master Thesis Topic Proposal, Ludwig Maximilian University of Munich

"Deep Artificial Neural Networks as a Tool for the Analysis of Seismic Data" 14.05.2018
Paper Review for Seismology Group Meeting, Ludwig Maximilian University of Munich

COMPUTING SKILLS

- Strong in Python3.
- Frequently uses libraries necessary for machine learning, scientific programming, and working with time-series data such as: Sklearn, Keras, Tensorflow, Pandas, NumPy, SciPy, Matplotlib, and ObsPy.
- Experience using High-Performance Computers (HPC)
- Operating system of choice is Mac OS X and Linux.
- Familiar with MATLAB and Fortran 77.
- Uses GitHub for version control of code and MLFlow to track Machine Learning lifecycle.
- Currently learning C++

ACCOMPLISHMENTS/OTHER

Utmost Recognition, Science Workshsop on Machine Learning in Geophysics 03.2019

- Recognition for teaching at the Munich Earth Science School on Machine Learning

First place in Informative Speech at Paul Winter's Invitational 11.2011

- First place in the Paul Winter's Speech and Debate Invitational Tournament at the University of the Pacific for Novice Informative Speech.

Understands Spanish fully and speaks at a working level.

ONLINE CLASSES CURRENTLY AUDITING FOR SELF-IMPROVEMENT

Algorithms Specialization Offered by Stanford via Coursera

Auditing this course in order to improve efficiency (both memory and time-wise) of code.

Topics covered: Divide & Conquer, Sorting and Searching, and Randomized Algorithms, Graph Search, Shortest Path, and Data Structures, Greedy Algorithms, Minimum Spanning Trees, and Dynamic Programming, NP-Complete Problems

Deep Learning Specialization Offered by deeplearning.ai via Coursera

Taking this course for review only.

Topics covered: Neural Networks, Deep Learning, How to Improve Deep Neural Networks (hyperparameter tuning, regularization, and optimization), Structuring Machine Learning Projects, CNN, Sequence Models