Phiala Thouvenin, Ph.D.

phialathouvenin@gmail.com ❖ (330) 437-9363 ❖ Chicago, IL ❖ phiala.net

EXPERIENCE

Uroboros Innovations **August 2024 – Present**
Consultant *Chicago, IL*

- Fused machine learning, computer vision, and geospatial techniques, utilizing Python machine learning tools such as PyTorch and TensorFlow and computer vision tools such as OpenCV, all using Azure ML services, for Earth resource discovery and classification.
- Oversaw the creation, training, and implementation of ML/AI pipelines.
- Mined large geospatial datasets for relevant information, preparing reports for stakeholders and the public.

Purdue University **August 2013 – July 2022**
Research and Teaching Assistant *West Lafayette, IN*

- Conceptualized and carried out multidisciplinary physical/numerical scientific experiments, leading to several international conference presentations and the development of several manuscripts in collaboration with multiple researchers.
- Formulated algorithms in Python, MATLAB and R, to process, segment, and statistically analyze experimental scientific image time-series data, resulting in large (100 million row+), well-organized tabular datasets, along with detailed scientific visualizations using matplotlib and other post-processing tools.
- Provided personal mentorship to numerous (>10) students and academic researchers, guiding them in the use of scientific techniques, software, and equipment, resulting in work presented at academic presentations, in theses and dissertations, and in peer-reviewed literature.
- Advised dozens of instructors and instructed hundreds of students, enhancing the quality of teaching within the department, and resulting in the recognition of instructional/advisory excellence through several awards.

The University of Akron **August 2011 – August 2013**
Graduate Research Assistant *Akron, OH*

- Conducted and executed 200+ numerical experiments using MATLAB and open-source numerical codes in C, applying novel algorithms to organize, process, and visualize extensive scientific statistical datasets, culminating in the publication of research in peer-reviewed journals and international conference presentations.
- Secured grants from multiple public and private funding agencies, accelerating the pace of research completion. Utilized grant funding for collaborative initiatives with other scientists across the United States.

EDUCATION

Purdue University **July, 2022**
Ph.D., Geophysics *West Lafayette, IN*
The University of Akron **August, 2013**
M.S., Geology *Akron, OH*
The University of Akron **August, 2011**
B.S., Geology *Akron, OH*

SKILLS

- **Languages:** Python, MATLAB, R, C/C++, Fortran, Java, SQL
- **Developer Tools:** Git, VS Code, RStudio, Jupyter Notebooks, Spyder, PyCharm, Azure ML
- **Libraries:** Scientific Python (Pandas/Polars, NumPy, SciPy, Matplotlib, scikit-learn, PyTorch),
- **Other Skills:** Technical Writing, Data Visualization, Numerical/Statistical Modeling, GIS Tools (ArcGIS/QGIS/rasterio), Machine/Deep Learning (PyTorch/TensorFlow/Keras/sklearn), Data Cleaning/Wrangling, Big Data Tools, Linux Tools, Shell Scripting, Adobe Products, Microsoft Products

PROJECTS

Purdue University **2015 – 2022**

- DISSERTATION*: The Impact of Erosion on Exhumation and Structural Configuration in Mountain Belts: Insights from Image Velocimetry Analysis of Coulomb Wedge Models.*
    - Simulated the growth and erosion of mountain systems using tools such as MATLAB (for digital image processing) and R/Python (for data cleaning, processing, analysis, and visualization).
    - Utilized detailed visualizations and statistical inference on complex time-series data to analyze changing parameter spaces, demonstrating their impact on overall experimental behavior.

The University of Akron **2011 – 2013**

- THESIS*: The Work Budget of Rough Faults.*
    - Numerically simulated geologic fault systems with Fortran, C, and MATLAB.
    - Employed statistical tools to identify influential parameters affecting system efficiency.
- *Methamphetamine-Related Criminal Activity in Summit County, Ohio; 2002-2012.*
    - Analyzed geospatial crime-related databases in ArcGIS, Excel, and MATLAB, also employing web scraping techniques for unstructured data.
    - Determined spatial, temporal, and demographic patterns of methamphetamine-related crime statistics.
- *Orientation Determination for the Northridge Fault Using Least-Squares and Partial Derivative Methods.*
    - Examined earthquake location data in MATLAB, employing competing mathematical techniques to fit the Northridge Fault's orientation in three dimensions.
    - Determined a least-squares method as the most accurate for overall fault geometry.

The University of Akron **2009 – 2011**

- SENIOR PROJECT*: Damage Zone Cracks Formed Under Quasi-Static and Dynamic Loading Conditions: Insights from Field Observations, Experiments, and Theory.*
    - Analyzed microscopy images with Adobe products and completed numerical modeling in MATLAB.
    - Presented work at national conferences and collaborated with researchers from other universities.
- SENIOR PROJECT*: Soil Magnetics as a Function of Pollution, Place, and Time.*
    - Processed environmental pollution data using Excel and MATLAB, determining pollution levels in soil samples based on proximity to urban roads.
    - Collaborated with and presented findings to external researchers.

PUBLICATIONS (née Newman)

- NEWMAN, P. J., GRIFFITH, W. A. (2014). THE WORK BUDGET OF ROUGH FAULTS. *Tectonophysics*. doi:10.1016/j.tecto.2014.08.007

VOLUNTEERING & OUTREACH

- Indiana Horse Rescue *[Frankfort, IN]* – 2020 to 2022
    - Fed and cared for horses every weekend
- Purdue EAPS Passport Day at Imagination Station *[Lafayette, IN]* – 2017 and 2018
    - Organized volunteers and educated children on scientific topics

INTERESTS

- Writing and Performing Music
- Software development for electronic music production
- Painting
- Equestrian Activities