

Phiala Thouvenin, Ph.D.

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EXPERIENCE

Uroboros Innovations <i>Computer Vision Consultant</i>	August 2024 – Present <i>Chicago, IL</i>
▪ Developed end-to-end machine learning and computer vision solutions for Earth resource discovery and classification, integrating geospatial analytics with PyTorch, TensorFlow, OpenCV, and Azure ML. ▪ Architected and deployed scalable AI/ML pipelines, overseeing model development, training, validation, and operational implementation. ▪ Processed and analyzed large-scale geospatial datasets to extract actionable insights, delivering technical reports and visualizations for stakeholders and public-facing audiences. ▪ Applied deep learning, image segmentation, and spatial analysis techniques to improve automated feature detection and classification workflows.	
Purdue University <i>Research and Teaching Assistant</i>	August 2013 – July 2022 <i>West Lafayette, IN</i>
▪ Designed and executed multidisciplinary experimental and numerical research programs, resulting in multiple peer-reviewed publications and presentations at international scientific conferences. ▪ Developed advanced Python, MATLAB, and R algorithms to process, segment, and analyze scientific image time-series datasets exceeding 100 million records. Built automated data processing and visualization workflows that transformed complex experimental observations into reproducible, publication-quality analyses. ▪ Mentored more than 10 graduate students and researchers in computational methods, scientific software, and laboratory techniques, contributing to theses, dissertations, conference presentations, and journal publications. ▪ Supported and advised dozens of instructors while teaching and mentoring hundreds of students, earning multiple departmental awards for instructional and advisory excellence.	
The University of Akron <i>Graduate Research Assistant</i>	August 2011 – August 2013 <i>Akron, OH</i>
▪ Conducted and executed 200+ numerical simulations using MATLAB and open-source numerical codes, 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 <i>Ph.D., Geophysics</i>	<i>West Lafayette, IN</i>
The University of Akron <i>M.S., Geology</i>	<i>Akron, OH</i>
The University of Akron <i>B.S., Geology</i>	<i>Akron, OH</i>

TECHNICAL SKILLS

- **Programming:** Python, MATLAB, R, C/C++, Fortran, Java, SQL
- **Machine Learning:** PyTorch, TensorFlow, scikit-learn, Keras
- **Computer Vision:** OpenCV, Image Segmentation, Object Detection
- **Geospatial:** ArcGIS, QGIS, Remote Sensing, Spatial Analysis
- **Data Science:** Pandas, Polars, NumPy, SciPy, Statistical Modeling

SELECTED RESEARCH 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 Magnetism 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