Dr. Krittanon "Pond" Sirorattanakul

Email: ksirorat@caltech.edu | Website: ksirorat.people.caltech.edu

Earth scientist looking to create data-driven solutions to problems across disciplines.

EDUCATION

Ph.D. Geophysics, minor in **Computer Science & Engineering**, California Institute of Technology **2024**
B.S. Physics; B.A. Earth & Environmental Sciences (highest honors), Lehigh University, PA, USA **2018**

EXPERIENCE

Geomechanics Specialist, *Chevron Technical Center, Houston, TX, USA* 08/24 – present

- Developing a physics-based workflow to model and forecast induced seismicity rates for various operating scenarios, including wastewater injection, oil & gas production, CO2 sequestration, and hydraulic stimulations. Delivered recommendations to mitigate seismic risks.
- Leading induced seismicity research to achieve industry leading technology, such as the investigating the impacts of thermal stress from CO2 sequestration on induced seismicity.

Graduate Research Assistant, *California Institute of Technology, Pasadena, CA, USA* 09/18 – 06/24

- Investigated the driving mechanisms of earthquake sequences by utilizing surface deformations data (GPS, InSAR) to invert for aseismic fault slip, statistics of seismicity occurrences, and stress-based earthquake nucleation models.
- Identified seasonal variations of seismicity rates in California and explained them with seasonal changes of water mass due to hydrological cycles.
- Designed laboratory experiments to measure ultraslow slip rate (10^{-12} m/s) along frictional interfaces using digital image correlation (DIC). Discovered continuous sliding behavior of interfaces even when driving stress is below the static friction threshold (published in ***Nature***). Paper Caltech News

Petroleum Engineer Intern, *Chevron Technical Center (Geomechanics)* 06/22 – 09/22, 06/23 – 09/23

- Implemented a novel method to estimate Gutenberg-Richter b-value statistics considering spatially varying detection levels and integrated it into **patent pending tools** (Link) for modeling and forecasting induced seismicity.
- Achieved stakeholder alignment on b-value ranges for Probabilistic Seismic Hazard Analysis (PSHA).

NASA-funded Education Research Intern, *Nurture Nature Center, Easton, PA, USA* 05/17 – 11/17

- Created middle-school lesson plans and developed datasets from satellite imagery for use in 3D display.

Lee Teng Intern, *Fermi National Accelerator Laboratory, Batavia, IL, USA* 06/16 – 08/16

- Designed graphical interfaces using a Java-based platform and LabVIEW for cryomodule testing.

TECHNICAL SKILLS

- Programming Languages: *MATLAB, python, UNIX/shell, CUDA C/C++, java, LabVIEW*
- Software Packages: *Tensorflow, Keras, sklearn, nltk, TextBlob, Numba, pandas, NumPy, ObsPy, GMT*
- Tools: *Google Colab, Jupyter Notebook, Git, SolidWorks (CAD), ArcGIS, QGIS, ENVI, Google Earth, Petrel, INTERSECT, ParaGeo, HyperMesh, Kinetix, KAPPA*

ACHIEVEMENTS

- Named **24 Under 24 Leaders and Innovators** in 2018 by the Mars Generation. News
- Published **7 peer-reviewed manuscripts** (Google citations = 88, h-index = 4).
- **Refereed 8 manuscripts** in various journals (Earth & Planetary Sci. Lett., Geophys. Res. Lett. etc.)
- Gave **11 invited talks and seminars** at universities (e.g., USC, UCLA, EPFL) and professional societies.
- GPS award for academic excellence in research, California Institute of Technology.
- Co-leaded **> 450 members** from **> 70 countries** in the Space Technology for Earth Applications (STEA) project group, Space Generation Advisory Council (SGAC) for 2 years.