Training Plan

Scientist Invitation Program to Korea 2025

Songkhun Boonchaisuk July 3, 2025

Summary

- machine learning to geophysics and geology
- Lineament extraction and structural mapping using Lansat and Sentinel-1 SAR data.
    - can be extended for modeling geological CO2 leakage
- DC resistivity data with borehole data and soil samples

Research Objectives and Methodology

time line (week)	focus on	topic
1-2	Foundations	o Python programming (Jupyter Notebooks, Pandas, NumPy, SQL) o Data analysis projects (data cleaning, visualization) o Essential mathematics for ML (statistics, probability, linear algebra, calculus)
3-4	Machine Learning Basics	o Core algorithms: Linear Regression, Logistic Regression, Decision Trees, Implementation from scratch and with Scikit-learn
5-6	Application to Geophysical/Geological Datasets	o Data preparation, exploratory analysis, feature engineering, and model training
7-8	Advanced Machine Learning Techniques	o Deep Learning fundamentals, random forests, gradient boosting, SVMs, Neural Networks
9-12	Final Project	o Define a research problem, gather and process data, train and evaluate models, and present results

Expected Outcomes & Impact

- Lineament extraction and structural mapping using Lansat and Sentinel-1 SAR data
  - I can apply this technique to study area in Thailand
- apply machine leaning technique to various fields especially in Geophysics and Geology datasets
- enrich my knowledge and research skills
- future collaborations among institutions across the Asia-Pacific region