How We Serve Power Utilities

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datasociety.com

WHAT WE DO (1 of 2):

Data Science Training

FOCUSED AND MISSION-DRIVEN DATA SCIENCE TRAINING

- Tailored program for the Advanced Analytics Group
- Designed for Data Scientists for Managers
- Broad array of advanced topics including clustering, supervised machine learning, anomaly detection, neural and feed forward networks

DATA SCIENCE ACADEMIES

- Nine-month program, including both in-person and live remote training
- Expert Instructors, teaching assistants, and coaches
- Included capstone projects that each student presented to peers and managers at the end of the program
- Trained 1,000 professionals across the client organization

Tailored Learning Objectives & Pathways

Expert Live Instruction

Knowledge Checks, Exercises, and Assessments

Coaching & Capstone Project Mentorship

Data Science Consulting and Solutions

Solutions

- Human-centered design & UX/UI
- Data visualization & dashboards
- Forecasting models and predictive analytics
- NLP & NLG
- Search engines
- Custom solutions

Consulting

- Innovation & design thinking
- Data architecting & acquisition
- Data processing & storage
- Digital insights that lead to process change and operational improvement

Most Recent Synchrophasor Work

High Current Flowing Through Underground Transmission Lines

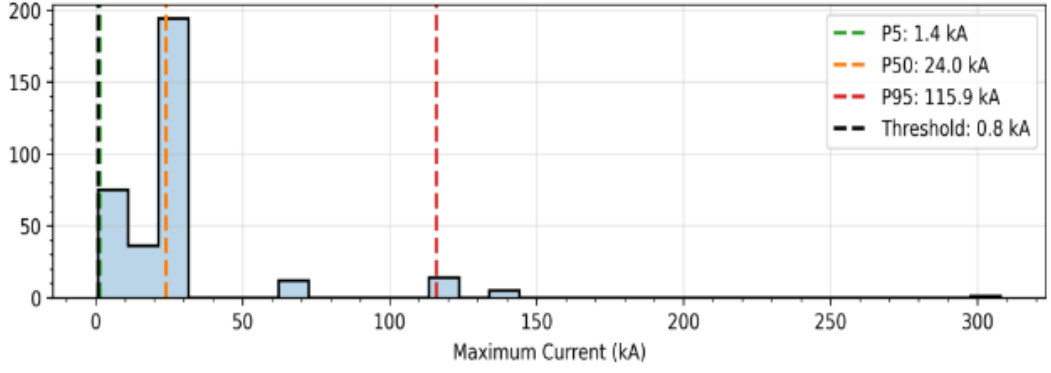
Pilot Project Overview

- **Challenge**
  - These faults often occur too fast to be caught by traditional SCADA sensors
  - Detection is important to prevent damage to the power system
- **Solution**
  - Using synchrophasor data from Digital Fault Recorders (DFRs) to monitor underground lines
- **Methodology**
  - End-to-end pipeline to gather data via the PredictiveGrid API by PingThings
  - Threshold set based on individual line's AMPS rating
  - Hierarchical search and parallelized computation implemented to account for scalability

Preliminary Findings

- **6 years' worth of data** scanned:
  - from January 1, 2019 – December 31, 2025
- **1000+** high current events detected **across different substations and lines**
  - 33 lines X 3 phases = 99 IPHM streams
- **Automated reports and visuals** to support further expert analysis and update data on daily basis
- **Extensible pipeline** that runs both on PredictiveGrid environment directly as well as leverages their newly released API

Histogram of count of events for 1 line:



Next steps

- Correlate synchrophasor events with external outage sources for deeper insight
- Refine detection algorithms based on findings to reduce false positives and improve accuracy

Data Society x Dominion Energy

- **Data Society**
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  - Alex Berry
  - Katya Mijatovic

- **Dominion Energy**
  - Richard Evans
  - Aaron Rogers
  - Robert Mason
  - Tanner Cullifer

This work wouldn't have been possible without Dominion Energy and the close collaboration between our two teams. We are looking forward for what's coming next!

For further information, please find us here. Thank you.

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