IBM PROJECT

POWER SYSTEM FAULT DETECTION AND CLASSIFICATION USING MACHINE LEARNING

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OUTLINE

- Problem Statement
- My solution
- IBM cloud services used
- Algorithm and deployment
- Result
- Conclusion
- Git-hub Link
- IBM Certifications



PROBLEM STATEMENT

Design a machine learning model to detect and classify different types of faults in a power distribution system. Using electrical measurement data (e.g., voltage and current phasors), the model should be able to distinguish between normal operating conditions and various fault conditions (such as line-to-ground, line-to-line, or three-phase faults). The objective is to enable rapid and accurate fault identification, which is crucial for maintaining power grid stability and reliability.



MY SOLUTION

I constructed a machine learning model for recognition and classification of power system events using voltage and current phasor data.

I carried out data preprocessing, model training, and performance evaluation with Random Forest Models in IBM Watson Studio.

The dataset included normal fault types.

Real-time predictions were made once the model was trained and deployed using IBM Watson Machine Learning.

The data was stored in IBM Watson Cloud Object Storage.



IBM CLOUD SERVICES USED

- IBM Watsonx Al Studio
- IBM Cloud object storage
- IBM watson machine learning

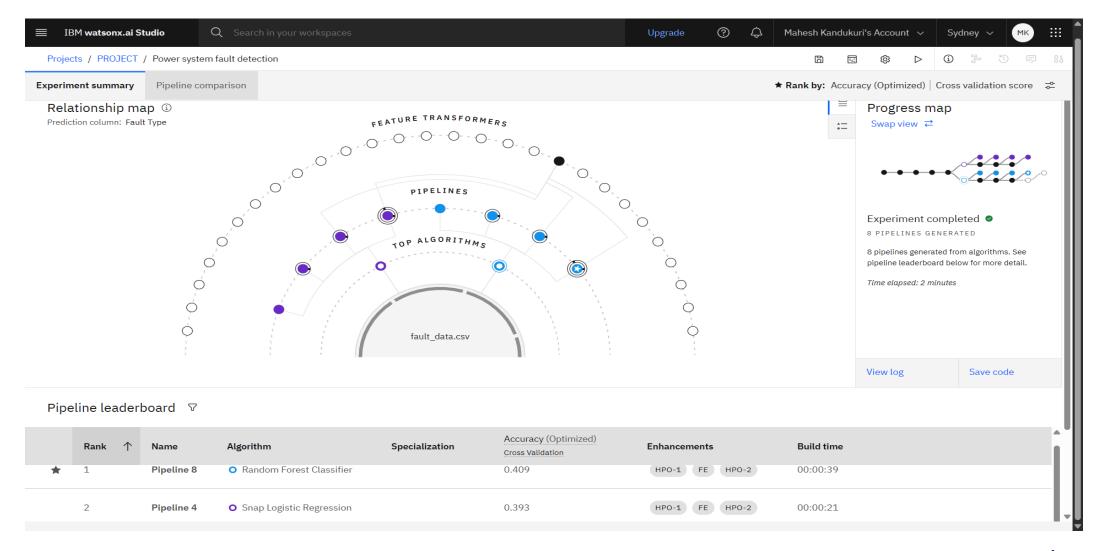


ALGORITHM AND DEPLOYMENT

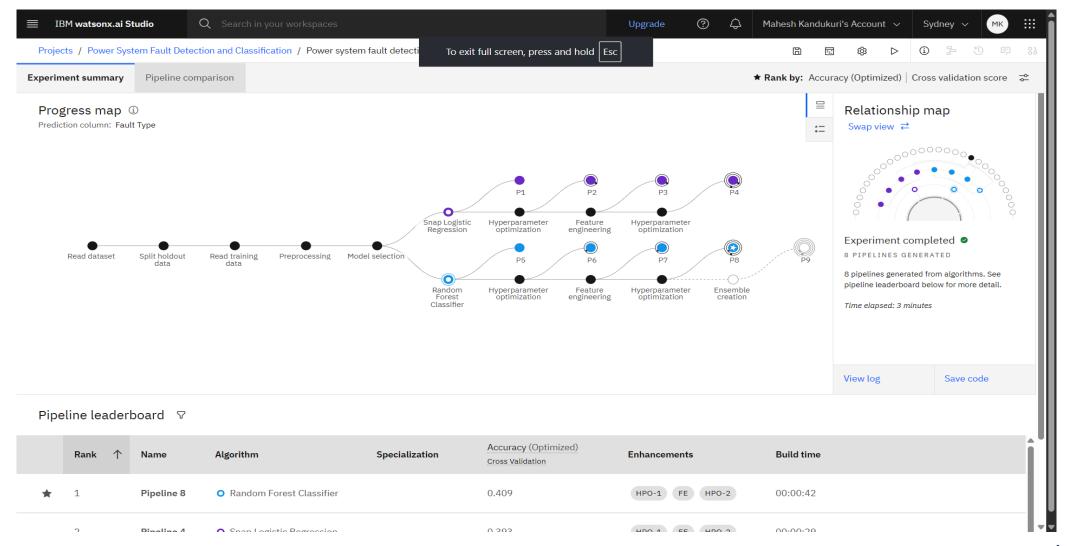
Random Forest Classifier

- Used as supervised learned model for classifying the fault type.
- Uses as input the features of the system such as the voltage/current magnitudes, phase angles, and sequence components.
- This model was selected due to its high accuracy, resilience to noisy data, and its performance in multi-class classification tasks

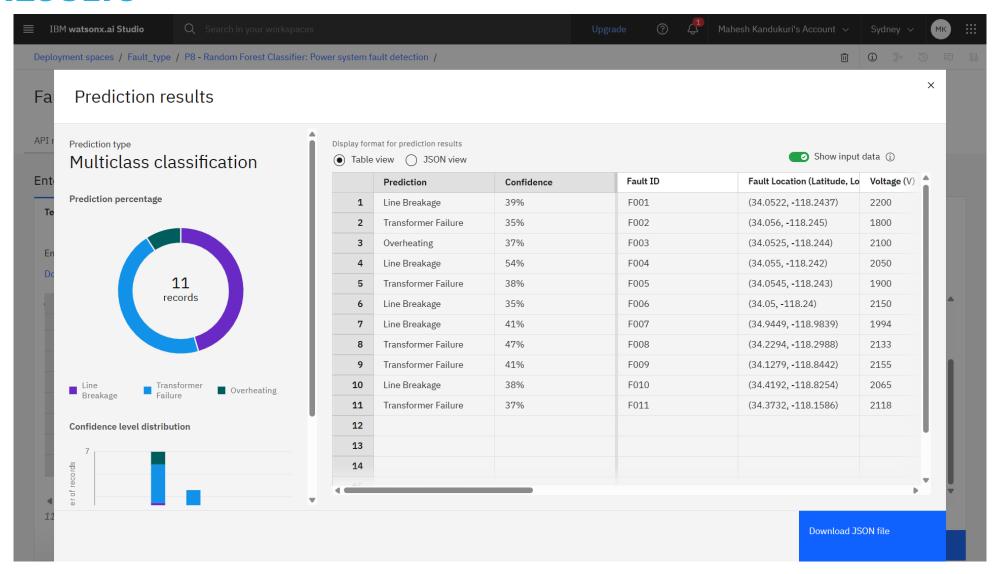




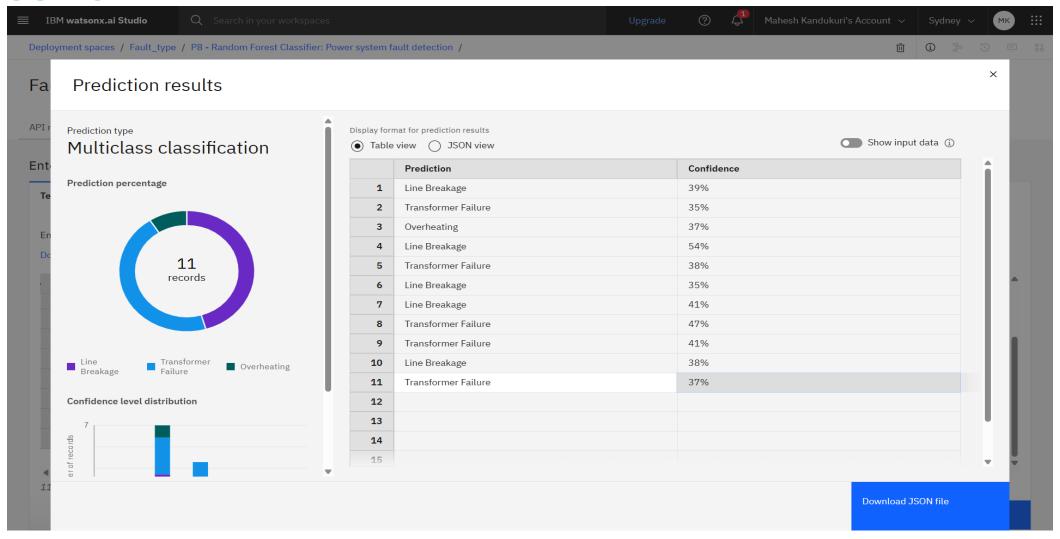














CONCLUSION

- A machine learning model was built to detect and classify power system faults using voltage and current data.
- IBM Cloud services like Watson Studio and Watson Machine Learning were used for model training and deployment.
- The solution enables fast and accurate fault identification, improving grid reliability and response time.



GITHUB LINK

Make sure that there should be readme file

https://github.com/2300080347M/-Power-System-Fault-Detection-and-Classification-using-ML



IBM CERTIFICATIONS

Screenshot/ credly certificate(getting started with AI)

In recognition of the commitment to achieve professional excellence Mahesh Kandukuri Has successfully satisfied the requirements for: Getting Started with Artificial Intelligence Issued on: Jul 17, 2025 Issued by: IBM SkillsBuild Verify: https://www.credly.com/badges/27210e7a-ac41-4f81-8d88-45f29b0d333d



Screenshot/ credly certificate(journey to cloud)





Attach your RAG LAB certificate here

IBM SkillsBuild

Completion Certificate



This certificate is presented to

Mahesh Kandukuri

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins



THANK YOU

