CAPSTONE PROJECT

POWER SYSTEM FAULT DETECTION AND CLASSIFICATION

Presented By:

1. Student Name-Devam Vinod Suryawanshi
2. College Name-MIT Academy Of Engineering
3. Department-Computer Engineering

edunet foundation

OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

PROBLEM STATEMENT

Electric power distribution networks often encounter various types of faults such as line-to-ground, line-to-line, and three-phase faults. Timely and precise identification of these faults is essential to reduce downtime and ensure the stability of the power grid. However, conventional protection mechanisms face challenges in accurately classifying faults in real time, particularly in complex or dynamic system conditions.

PROPOSED SOLUTION

The proposed system uses machine learning techniques on IBM Cloud to classify faults in power distribution networks. It processes real-time electrical measurements (voltage and current phasors) to distinguish:

•Normal conditions
•Line-to-ground faults
•Line-to-line faults
•Three-phase faults

Key Components:
•Data Collection (Phasor measurements)
•Feature Extraction (Signal processing)
•Model Training (ML algorithm)
•Real-time Fault Classification
•Cloud Deployment (IBM Cloud services)

SYSTEM APPROACH

The "System Approach" section outlines the overall strategy and methodology for developing and implementing **the Power system Fault Detection and Classification**. Here's a suggested structure for this section:

- **System requirements**

  IBM Cloud

  IBM Watson studio for model development and deployment

  IBM cloud object storage for dataset handling

ALGORITHM & DEPLOYMENT

- **Algorithm Selection:**

  Random Forest Classifier (or SVM based on performance)

- **Data Input:**

  Voltage, Current, and phasor measurments from the dataset

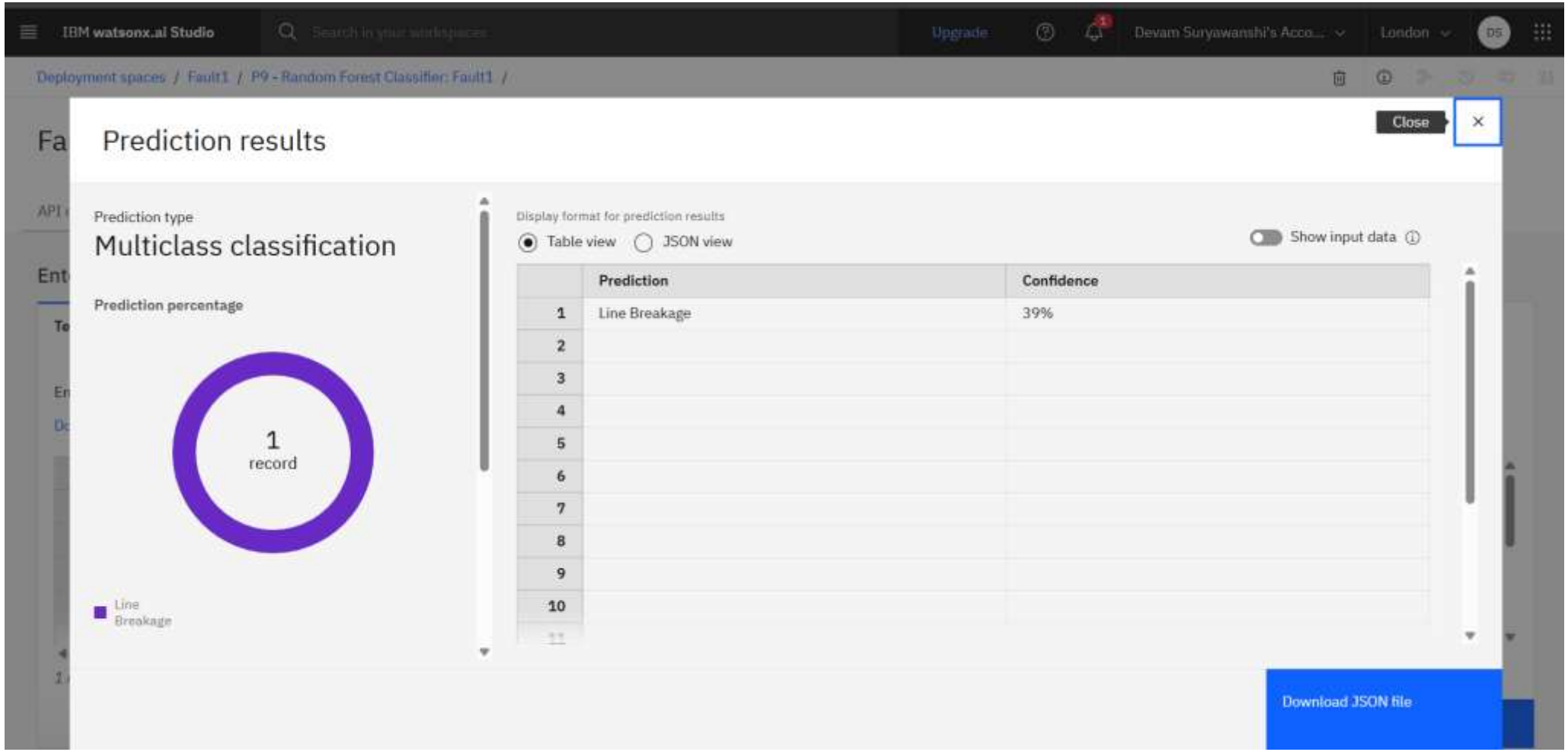
- **Training Process:**

  Supervised learning using labelled fault types

- **Prediction Process:**

  Model deployed on IBM watson studio with API endpoint for real-time predictions

RESULT



CONCLUSION

- The ML-based fault classification system significantly improves accuracy and response time over traditional protection methods. Real-time analysis helps utilities reduce outage time and improve grid resilience.

GITHUB LINK:

https://github.com/DevamSuryawanshi/Power-System-Fault-Detection-and-Classification/tree/main

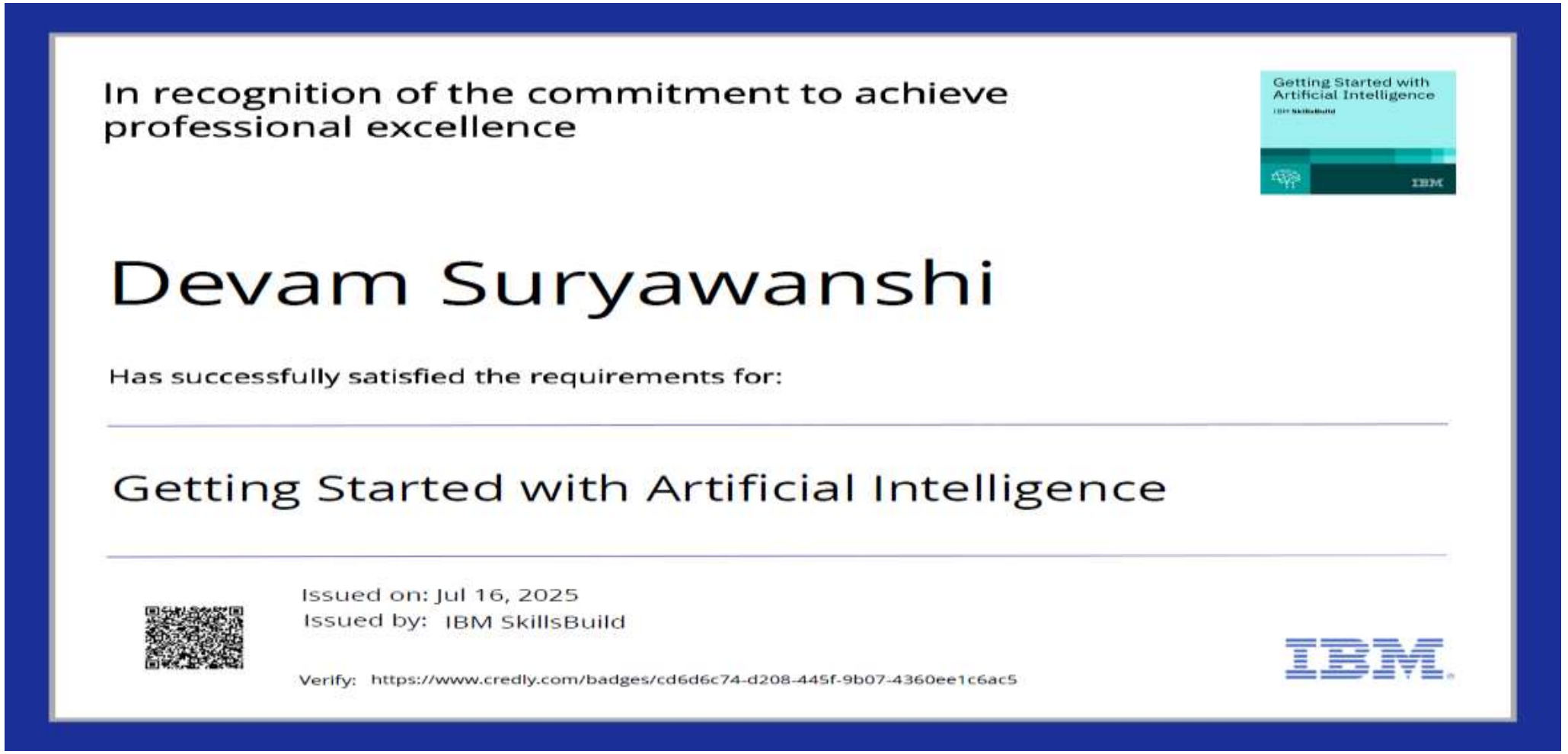
FUTURE SCOPE

- Expand to transmission grid faults
- Integrate with real-time IoT sensor networks
- Use deep learning models (e.g., LSTM) for better temporal pattern detection
- Add predictive maintenance features

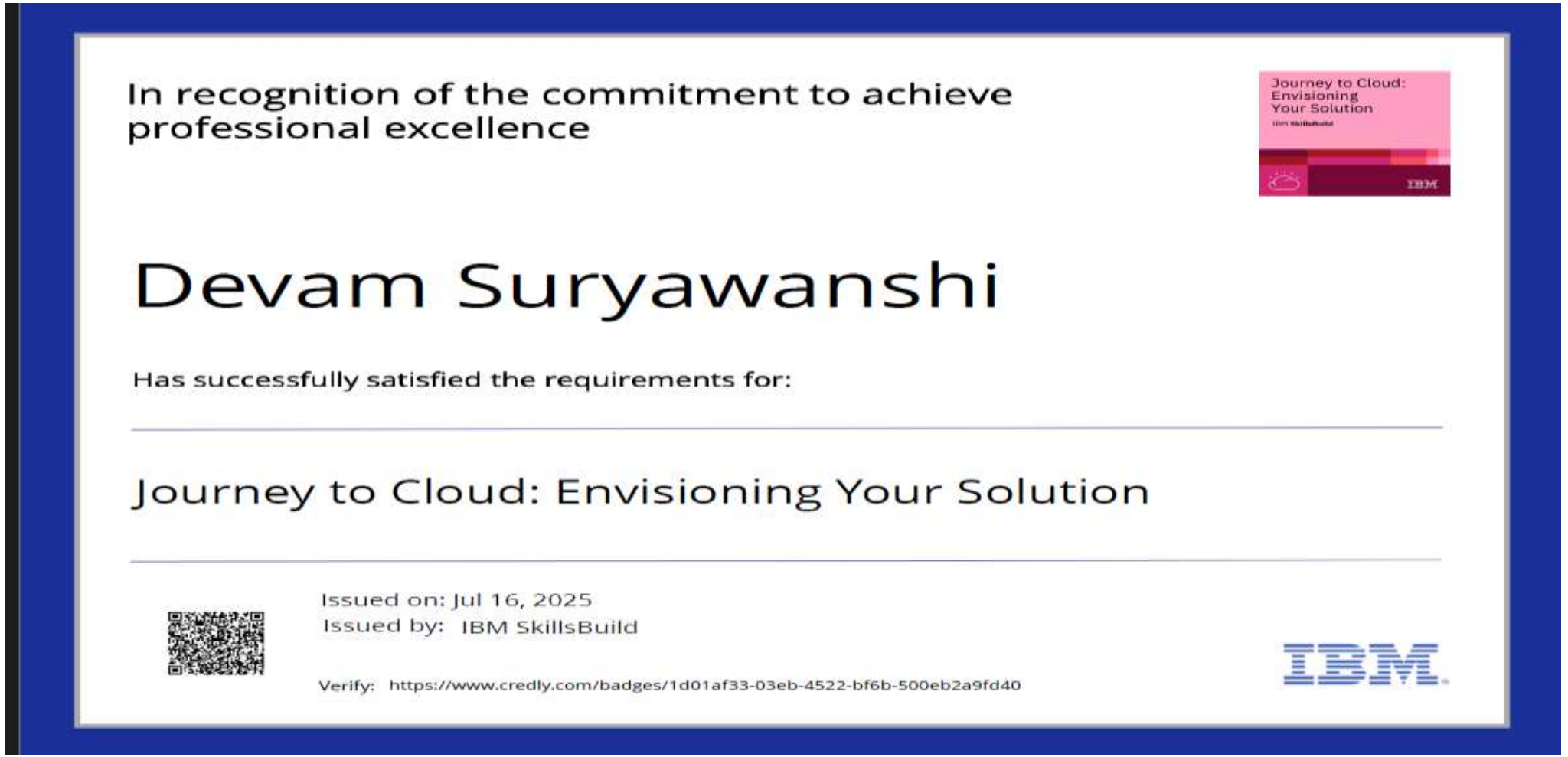
REFERENCES

- IEEE papers on power system fault detection
- IBM Cloud documentation
- Scikit-learn, TensorFlow libraries
- Research on phasor measurement-based fault analysis

IBM CERTIFICATIONS



IBM CERTIFICATIONS



In recognition of the commitment to achieve professional excellence

Journey to Cloud: Envisioning Your Solution

IBM

Devam Suryawanshi

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution

Issued on: Jul 16, 2025
Issued by: IBM SkillsBuild

Verify: https://www.credly.com/badges/1d01af33-03eb-4522-bf6b-500eb2a9fd40

IBM

IBM CERTIFICATIONS

IBM **SkillsBuild** Completion Certificate

This certificate is presented to

Devam Suryawanshi

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

edunet foundation

THANK YOU

edunet foundation