INTELLIGENT CLASSIFICATION OF RURAL INFRASTRUCTURE PROJECTS

CAPSTONE PROJECT

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OUTLINE

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PROBLEM STATEMENT

Manual classification of rural road/bridge projects into PMGSY scheme types (PMGSY-I, PMGSY-II, RCPLWEA, etc.) is time-consuming, error-prone, and not scalable.

With thousands of infrastructure projects across India, there's a critical need to automate this classification process based on physical and financial project attributes.

PROPOSED SOLUTION

We propose a machine learning-based classification system to predict the PMGSY scheme type for any given project.

Using attributes like road length, cost, expenditure, and region, the system will learn patterns to auto-classify new projects.

It will improve decision-making, transparency, and reduce manual workload.

SYSTEM DEVELOPMENT APPROACH

- Dataset from AI Kosh & Dataful: project-level cost, length, and scheme type
- Tools: Python, Pandas, scikit-learn, IBM Watson Studio
- IBM Cloud Lite: model development and hosting
- Preprocessing: missing value handling, label encoding
- Feature Selection: cost, length, location, etc.

ALGORITHM & DEPLOYMENT

• ML Model: Random Forest Classifier

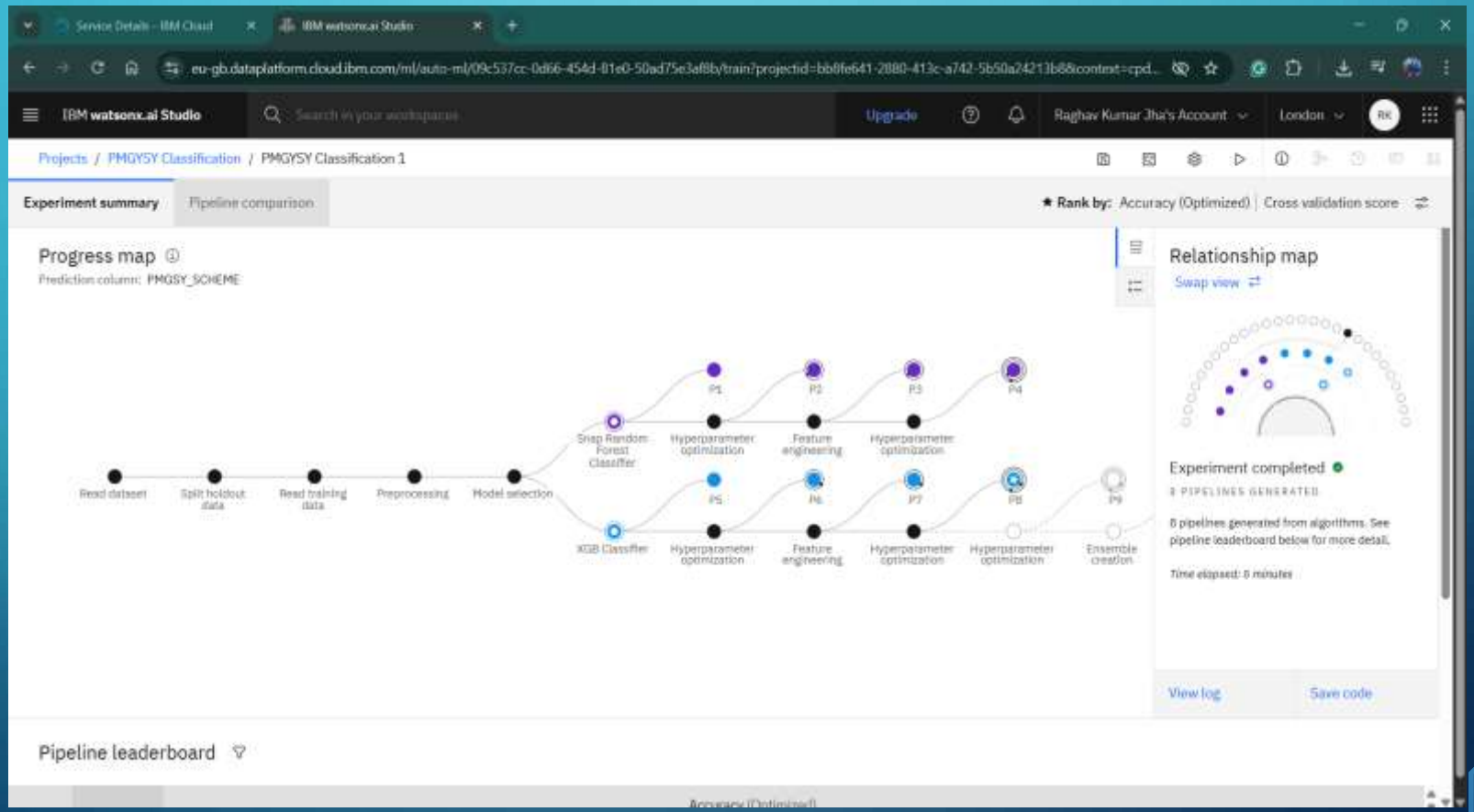
• Input: project attributes (cost, length, district/state)

• Output: predicted PMGSY scheme type

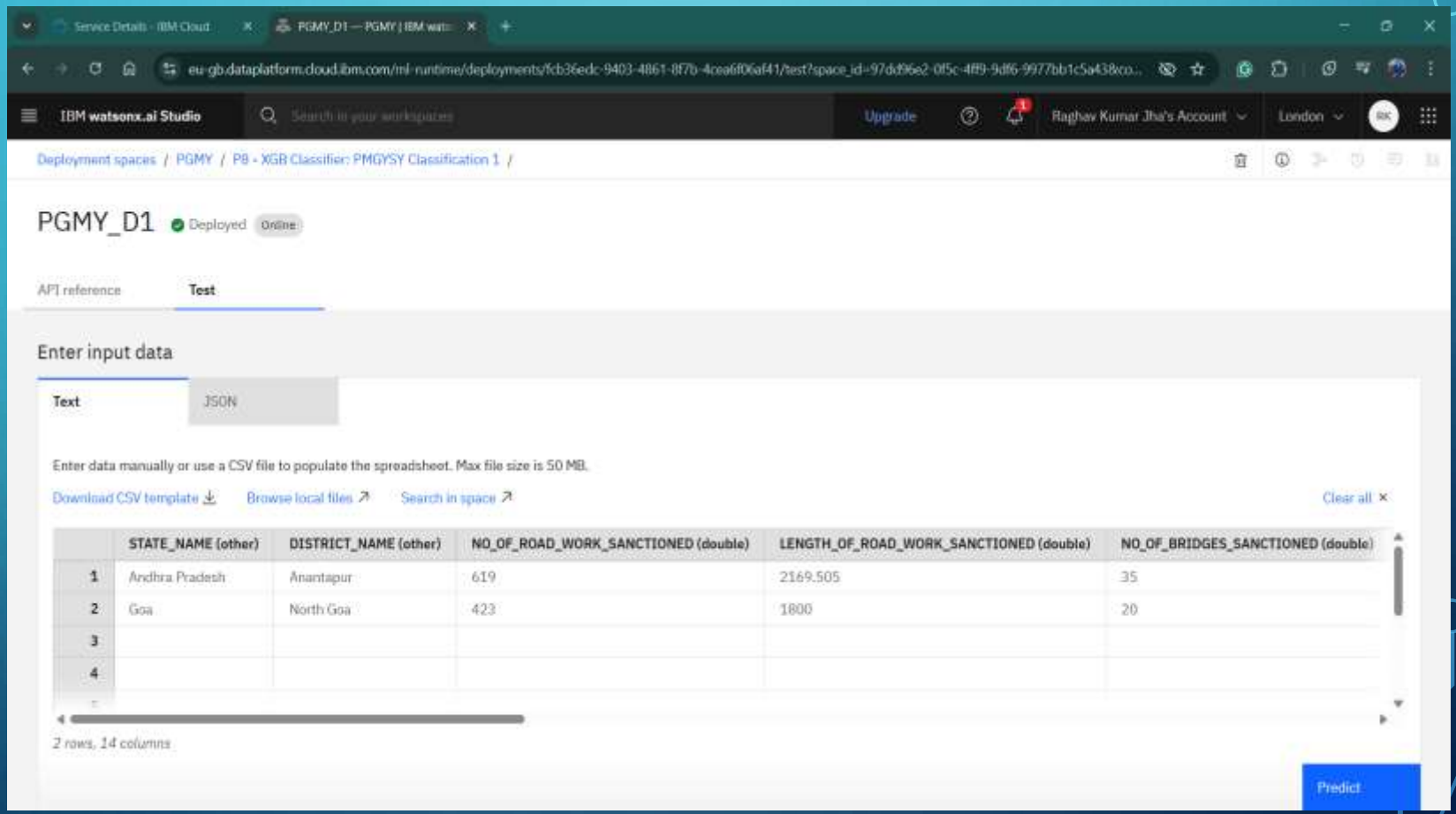
• Evaluation: accuracy, confusion matrix, classification report

• Deployment: IBM Watson Studio or Flask app on Render

RESULT


IBM watsonx.ai Studio
Upgrade
Raghav Kumar Jha's Account
London
Projects / PMGYSY Classification / PMGYSY Classification 1
Experiment summary
Pipeline comparison
Rank by: Accuracy (Optimized) | Cross validation score
Progress map
Prediction column: PMGSY_SCHEME
Read dataset
Split holdout data
Read training data
Preprocessing
Model selection
Snap Random Forest Classifier
XGB Classifier
Hyperparameter optimization
Feature engineering
Ensemble creation
Relationship map
Swap view
Experiment completed
8 PIPELINES GENERATED
8 pipelines generated from algorithms. See pipeline leaderboard below for more detail.
Time elapsed: 0 minutes
View log
Save code
Pipeline leaderboard

RESULT


IBM watsonx.ai Studio
Upgrade
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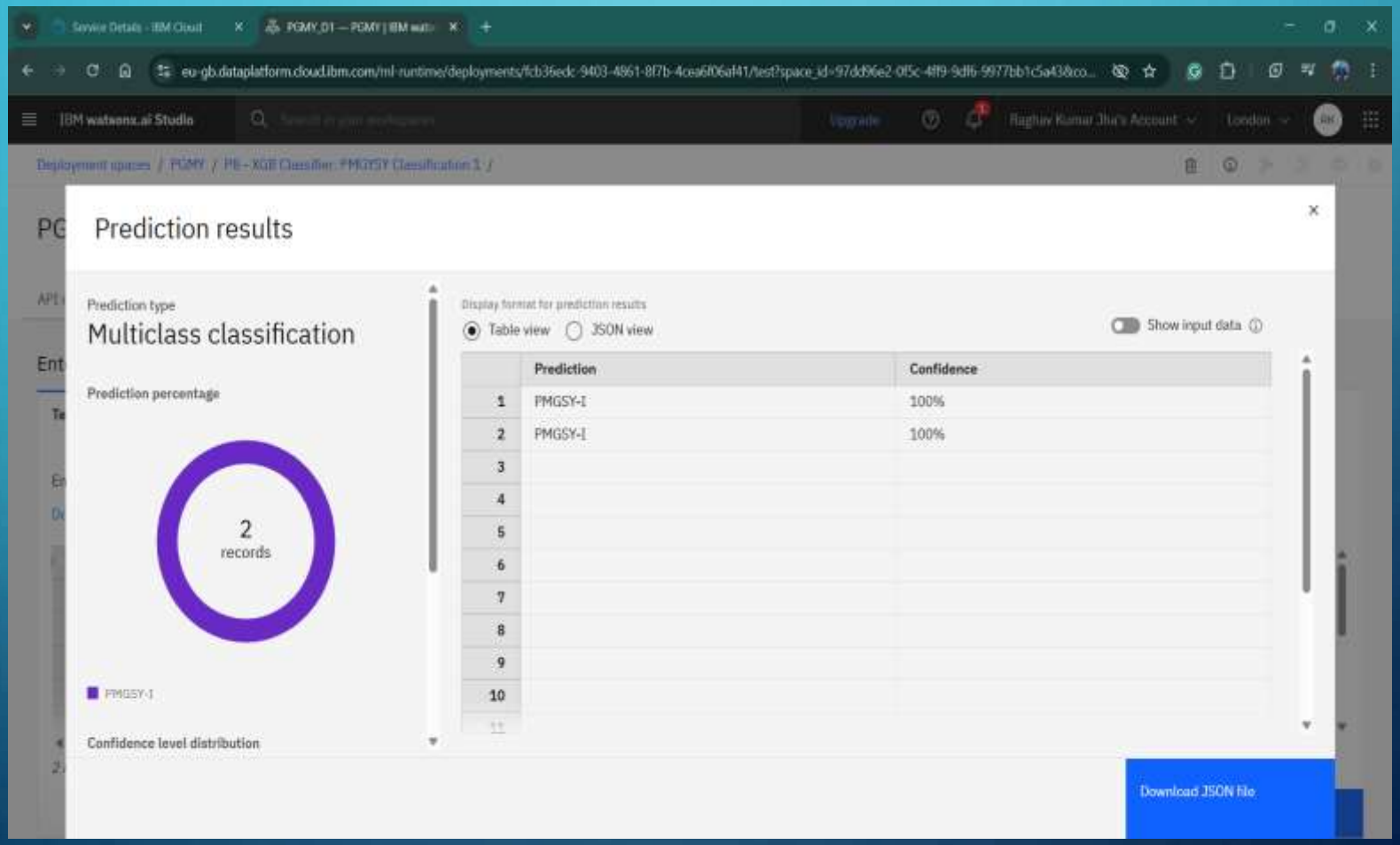
London
Deployment spaces / PGMY / P8 - XGB Classifier: PMGYSY Classification 1 /
PGMY_D1
Deployed
Online
API reference
Test
Enter input data
Text
JSON
Enter data manually or use a CSV file to populate the spreadsheet. Max file size is 50 MB.
Download CSV template
Browse local files
Search in space
Clear all
STATE_NAME (other)
DISTRICT_NAME (other)
NO_OF_ROAD_WORK_SANCTIONED (double)
LENGTH_OF_ROAD_WORK_SANCTIONED (double)
NO_OF_BRIDGES_SANCTIONED (double)
1 Andhra Pradesh Anantapur 619 2169.505 35
2 Goa North Goa 423 1800 20
3
4
2 rows, 14 columns
Predict

RESULT


Prediction results
Prediction type
Multiclass classification
Prediction percentage
2
records
PMGSY-I
Confidence level distribution
Display format for prediction results
Table view
JSON view
Show input data
Prediction
Confidence
1 PMGSY-I 100%
2 PMGSY-I 100%
3
4
5
6
7
8
9
10
Download JSON file

CONCLUSION

THE PROPOSED ML MODEL ACCURATELY PREDICTS PMGSY SCHEME TYPES USING REAL PROJECT DATA.

IT REDUCES MANUAL EFFORTS, ENHANCES TRANSPARENCY, AND IMPROVES DECISION SUPPORT FOR RURAL INFRASTRUCTURE PLANNING.

FUTURE SCOPE

Add	Add more project attributes (terrain, weather, etc.)
Improve	Improve accuracy using Deep Learning models
Build	Build user-friendly interface for government departments
Integrate	Integrate with real-time project dashboards

REFERENCES

- https://aikosh.indiaai.gov.in/

- https://cloud.ibm.com

- scikit-learn documentation

- Dataful PMGSY datasets

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According to the Adobe Learning Manager system of record

Completion date: 15 Jul 2025 (GMT)

Learning hours: 20 mins

THANK YOU