Urban Navigator

Urban Navigator aims to revolutionize India's urban mobility through machine learning-powered metro stop prediction. It analyzes historical data and real-time factors to predict metro stations with greater accuracy, reducing commuter frustration and inefficiencies.

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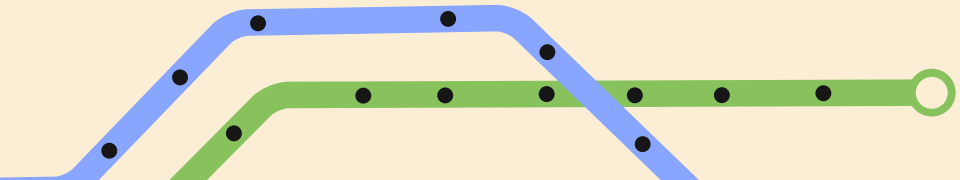


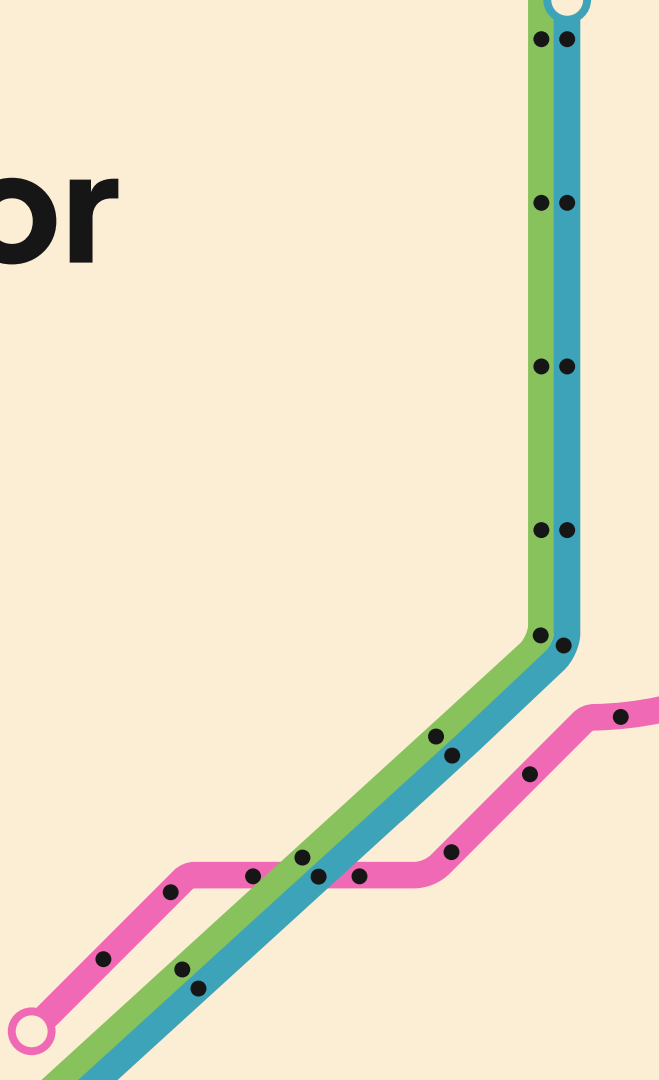
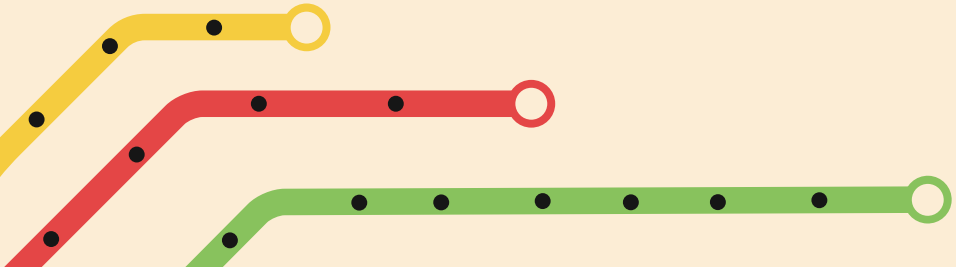


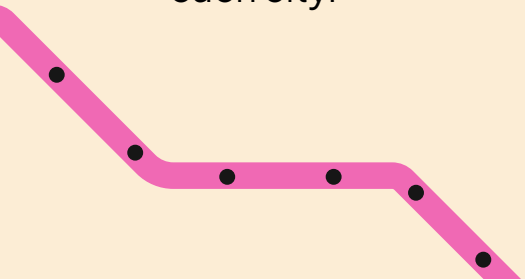
Table of contents

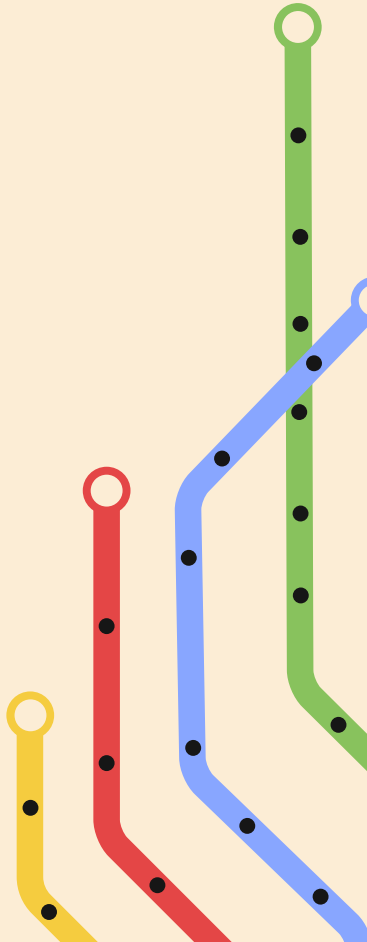


Project Overview

The proposed approach, designated "Urban Navigator," utilizes data on existing metro infrastructure across various Indian cities. This data, meticulously acquired through both manual compilation and web scraping techniques, is organized into comprehensive datasets specific to each city.

Furthermore, each dataset incorporates a dedicated target column signifying the presence or absence of a metro stop at specific geographic coordinates, serving as the foundation for subsequent model development and evaluation.





Need Analysis

The proposed project, Urban Navigator, addresses a pressing need for efficient urban transportation planning in Indian cities. With rapid urbanization and population growth, there is a critical demand for reliable and sustainable transportation infrastructure, such as metro systems.

Urban Navigator aims to fill this gap by leveraging machine learning techniques to predict optimal locations for new metro stops

Related Work

Delhi Metro Rail Corporation, one of the widely used metro organizations has been based upon utilizing mathematical modelling methods such as gravity modelling.

DMRC

01

02

OpenStreetMap

Aims to transform urban areas into sustainable and technology-driven ecosystems through the implementation of innovative solutions.

Smart Cities India

03

04

Transport For London(TfL)

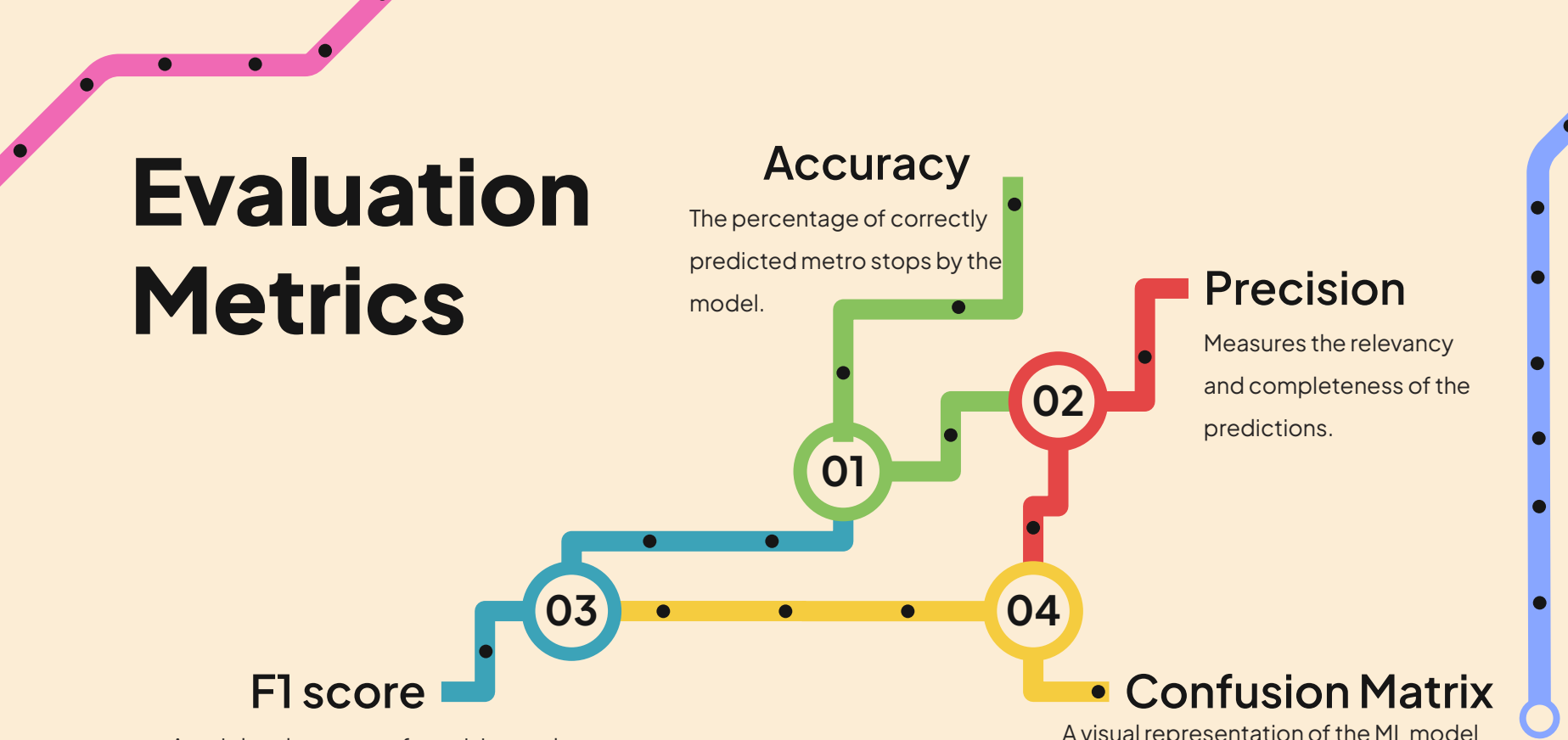
Objectives

- Develop a platform or website to extract data from the homegrown dataset to serve as a comprehensive repository of geospatial information about the city in question.
- Validate robust machine learning models for predicting optimal metro stop locations. The accuracy and reliability of these predictive models should be ensured through rigorous training and validation processes.
- Foster collaboration and knowledge sharing within relevant communities. Through initiatives such as open-source projects, workshops, and publications.
- Evaluate effectiveness through comparisons with various machine learning models.

Methodology

Data Collection	Gather comprehensive datasets for each city, including urban characteristics, existing metro stops, and relevant geographical information, followed by Feature Engineering and Pre-Processing
Model Selection	Train and validate machine learning models using the prepared datasets to predict optimal metro stops.
Training Process	Preparing the data for training, splitting it into training and validation sets. Iterating through different hyperparameters and algorithms to optimize performance.

Evaluation Metrics



Accuracy

The percentage of correctly predicted metro stops by the model.

Precision

Measures the relevancy and completeness of the predictions.

F1 score

A weighted average of precision and recall, balancing false positives and false negatives.

Confusion Matrix

A visual representation of the ML model performance showing true negatives, false positives, false negatives, and true positives.

Outcomes

Models

Robust Machine Learning Models predicting optimal metro locations.

Collaboration on Platforms

Knowledge-sharing initiatives within the urban planning and data communities.

Evaluation Reports

Evaluation reports to assess the effectiveness of the predictive mapping technology.

Archive

Develop a platform to facilitate long-term storage and retrieval of the collected information.

Work Plan

Sr.No	Activity	Month	Mar	April	May	June	July	Sept	Nov	Dec
1	Planning of project									
2	Literature Survey									
3	Deciding Attributes									
4	Data Collection									
5	Normalizing Data									
6	Devising Models									
7	Model Calibration									
8	Results Evaluation									
9	Final Report									

Role Playing

Vikram Maram	• Project Planning • Deciding Attributes • Data Collection
Rahul Divi	• Data Collection • Literature Survey • Devising Models
Swaroop Kuchi	• Normalizing Data • Data Collection • Model Calibration
Harsha Vardhan Reddy	• Deciding Attributes • Devising Models • Documentation