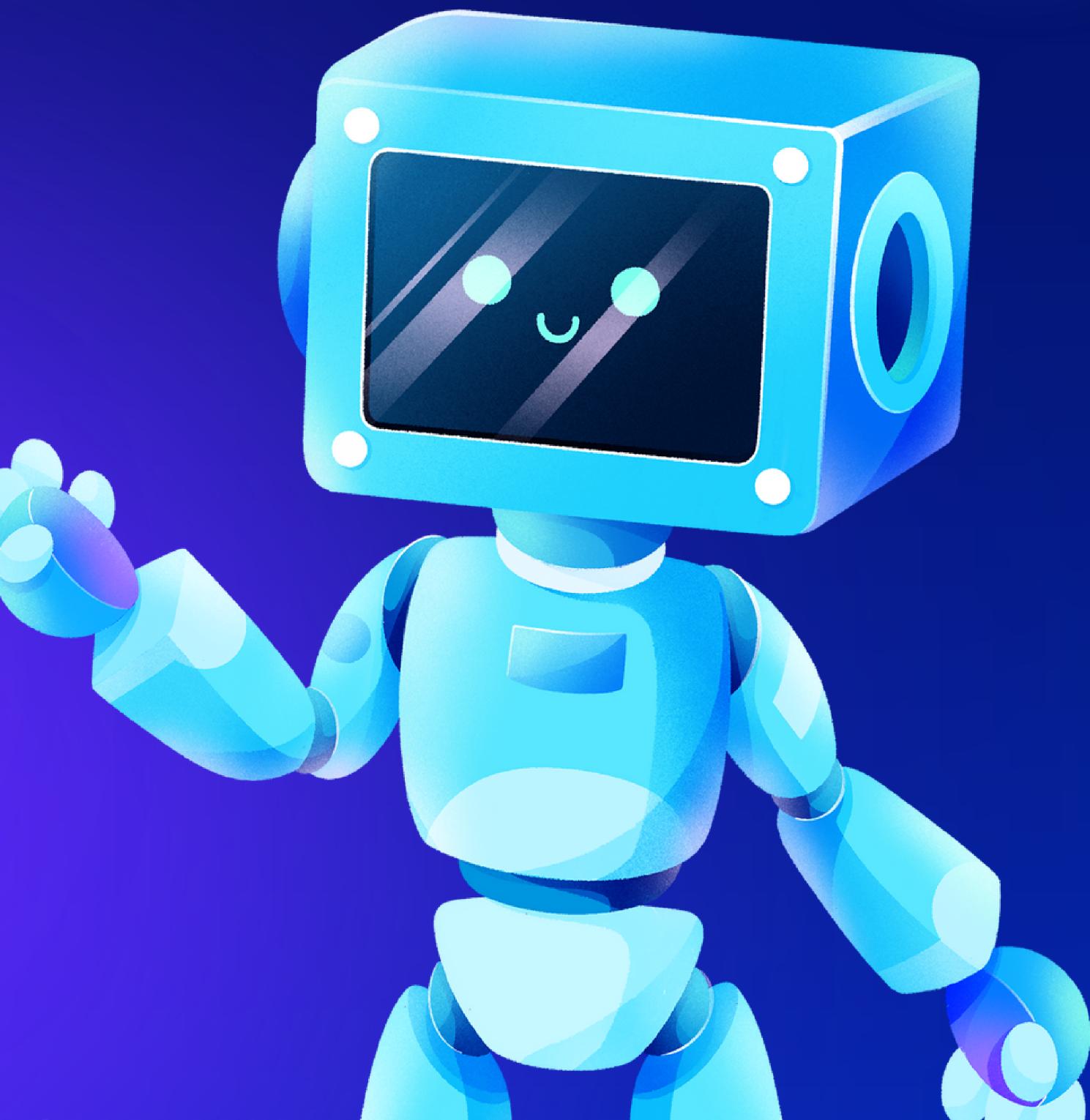


PROJECT 4 - GROUP 1  
FANNY  
JORGE  
KAMAL  
TANIA

# TORONTO REAL ESTATE PRICE PREDICTOR

FEB. 12TH 2024



# PROJECT OVERVIEW

This project focuses on predicting real estate prices in Toronto based on various features.

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## Significance of the Project

Predicting real estate prices is valuable for both buyers and sellers, aiding in informed decision-making.



# PROJECT BACKGROUND

- Toronto Real Estate Listings
- Dynamic Real Estate Market
- Challenges with Price Variability
- Diverse neighborhoods
- Fluctuating Market Trends

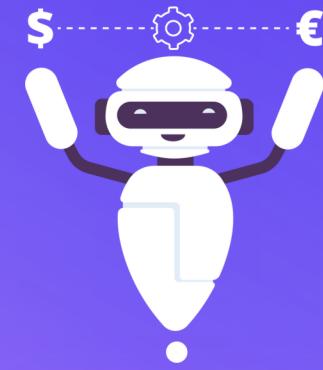


# DATA PREPROCESSING



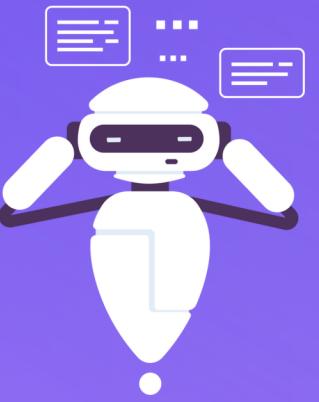
## CLEANING AND PREPROCESSING

- Outlier Removal
- Handling Missing Values



## FEATURE ENGINEERING

- Coordinates
- Luxury Listings



## DATA STORAGE

- PostgreSQL
- SQLAlchemy

# MACHINE LEARNING MODELS



## RANDOM FOREST REGRESSOR

- Robustness
- Effectiveness

## ALTERNATIVE METHODS EXPLORED

- Linear Regression
- Random Forest

# MODEL TRAINING & EVALUATION



## DATA PREPARATION

- Handling Categorical and Numerical Features



## TRAINING THE MODEL

- Random Forest Regressor
- Hyperparameter Tuning



## CROSS-VALIDATION

- Mean Absolute Error (MAE) Scores 76558
- Highest margin of error 13.49% (New Toronto neighborhood)

# WEB DEVELOPMENT

Utilized Bootstrap for styling

```
<!--Using style sheet from bootstrap5-->
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstrap.min.css" rel="stylesheet">
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/js/bootstrap.bundle.min.js"></script>
```

Key elements example: Property Type Dropdown

```
<div class="col-xs-12 col-sm-6 col-md-2">
    <label for="dropdown-property-type" class="form-label">Property type</label>
    <select id="dropdown-property-type" class="form-control">
        <option value="" selected disabled hidden>Choose here</option>
        <option value="condo_apartment">Condo Apartment</option>
        <option value="condo_townhome">Condo Townhome</option>
        <option value="freehold_townhome">Freehold Townhome</option>
        <option value="detached_home">Detached Home</option>
    </select>
</div>
```

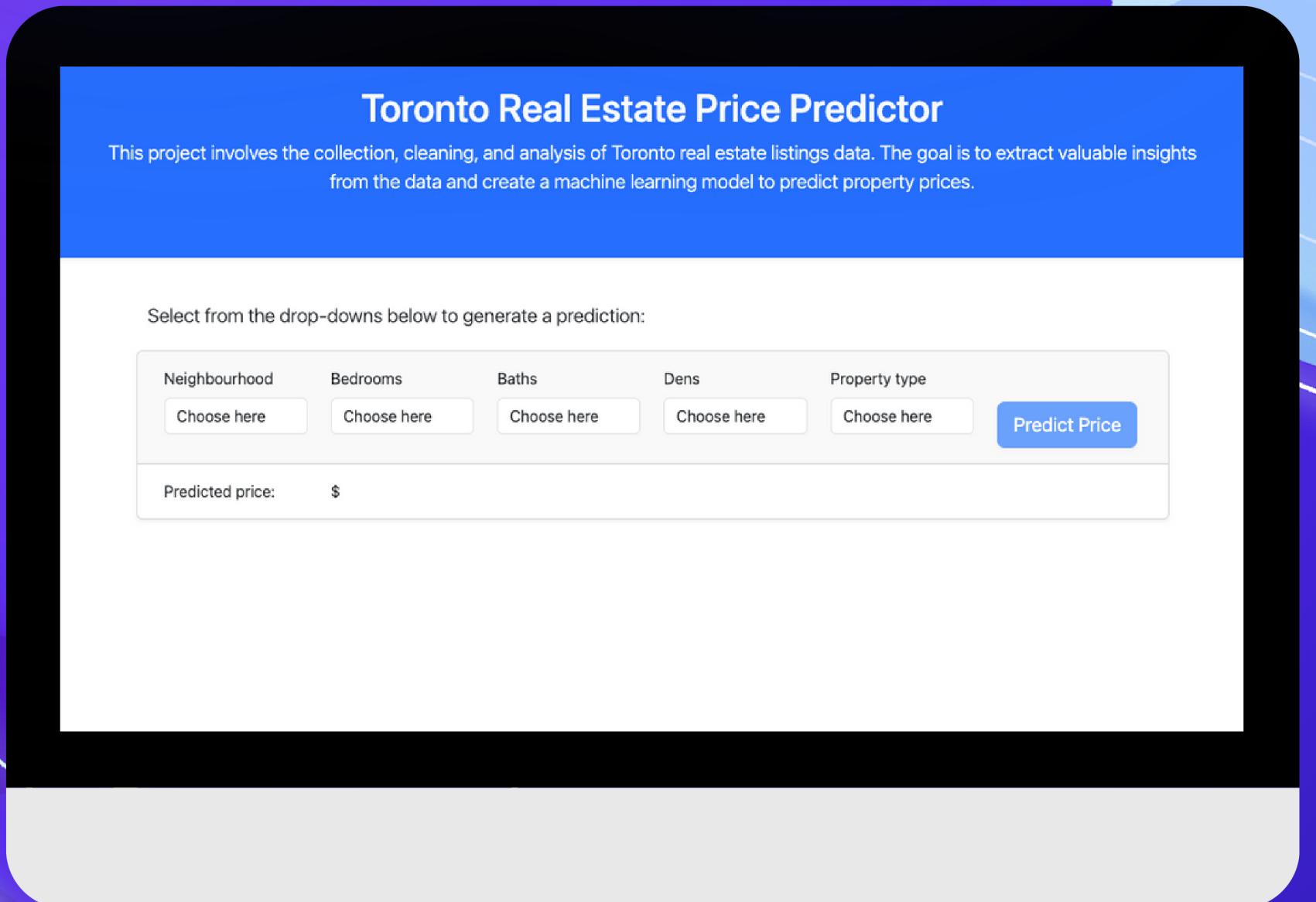
# WEB DEVELOPMENT

## ROLE OF JAVASCRIPT

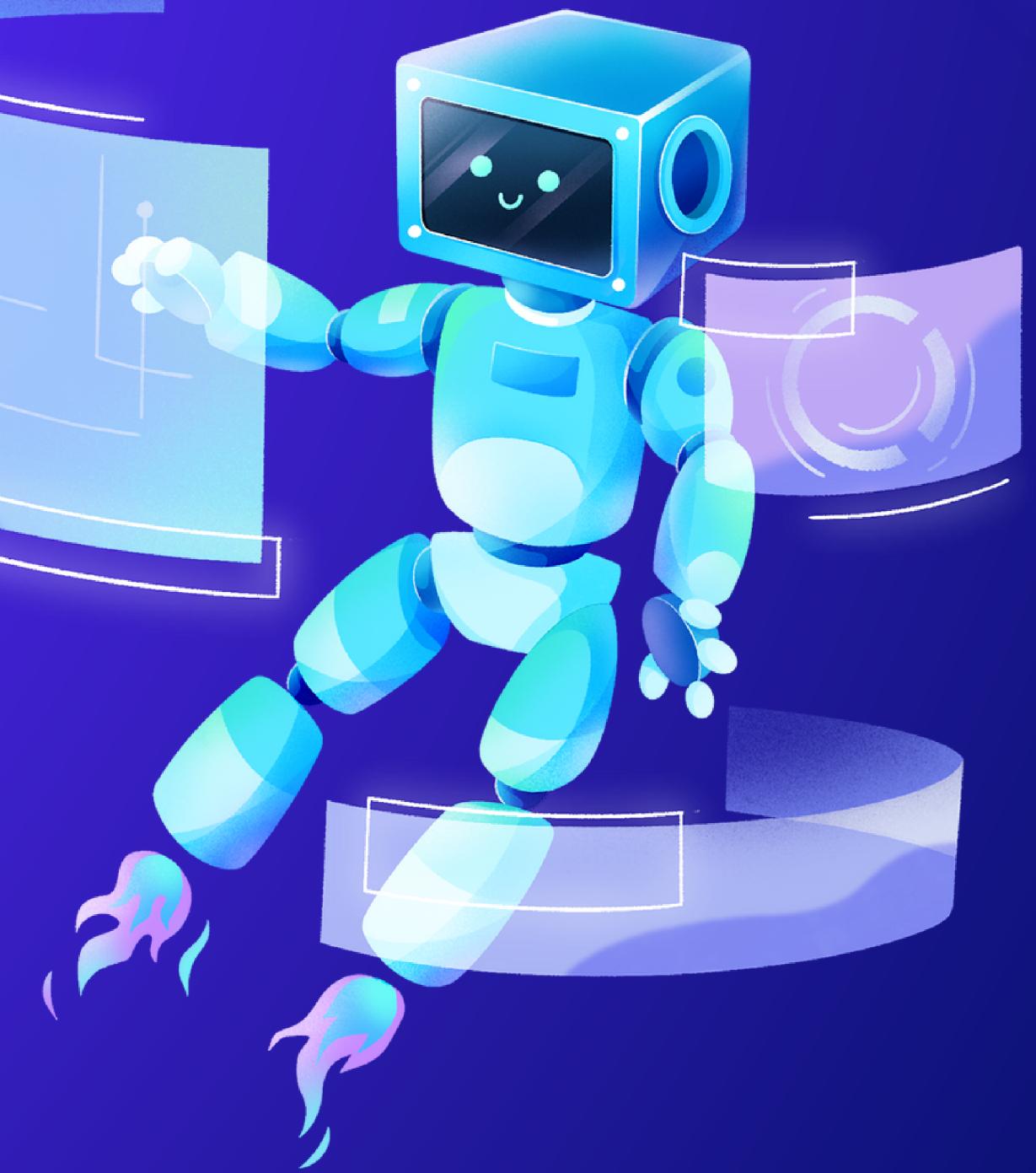
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- User interactions
- Input with machine learning model
- Updates based on predictions

# MODEL DEMO



The image shows a smartphone displaying a web-based application for predicting real estate prices. The app has a blue header with the title "Toronto Real Estate Price Predictor". Below the header, there is a descriptive text: "This project involves the collection, cleaning, and analysis of Toronto real estate listings data. The goal is to extract valuable insights from the data and create a machine learning model to predict property prices." A section titled "Select from the drop-downs below to generate a prediction:" contains five input fields: "Neighbourhood" (with a "Choose here" button), "Bedrooms" (with a "Choose here" button), "Baths" (with a "Choose here" button), "Dens" (with a "Choose here" button), and "Property type" (with a "Choose here" button). To the right of these fields is a "Predict Price" button. At the bottom of the screen, it says "Predicted price: \$" followed by a blank input field.



# CHALLENGES

- Data-Related Challenges
- Modeling Challenges
- Web Development Challenges



# FUTURE WORK

- Improvements and enhancements
  - Model Refinement
  - Feature Enhancement
- Next Steps for Further Development
  - Integration of Real-Time Data
  - User Feedback Loop
  - Collaboration with Real Estate Experts



# CONCLUSIONS

- Empowering homebuyers and sellers
- Contributing to Market Transparency
- Potential for Industry Influence



THANK YOU!

