

Final Project Report: Satellite Imagery Based Property Valuation

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1. Data Acquisition and Fetching

To build a robust valuation model, a large-scale dataset was required.

- **Large Scale Data:** The project successfully managed the acquisition and verification of 12,000 property images.
- **Automation:** I used `prepare_data.py` and `resume_download.py` to handle the bulk download and organization of the image library.

```
--- 1. Loading train(1).xlsx ---
✓ Loaded 16209 rows.
✓ GREAT NEWS: 'price' column found! This is the correct Training Set.
Created folder: data/house_images

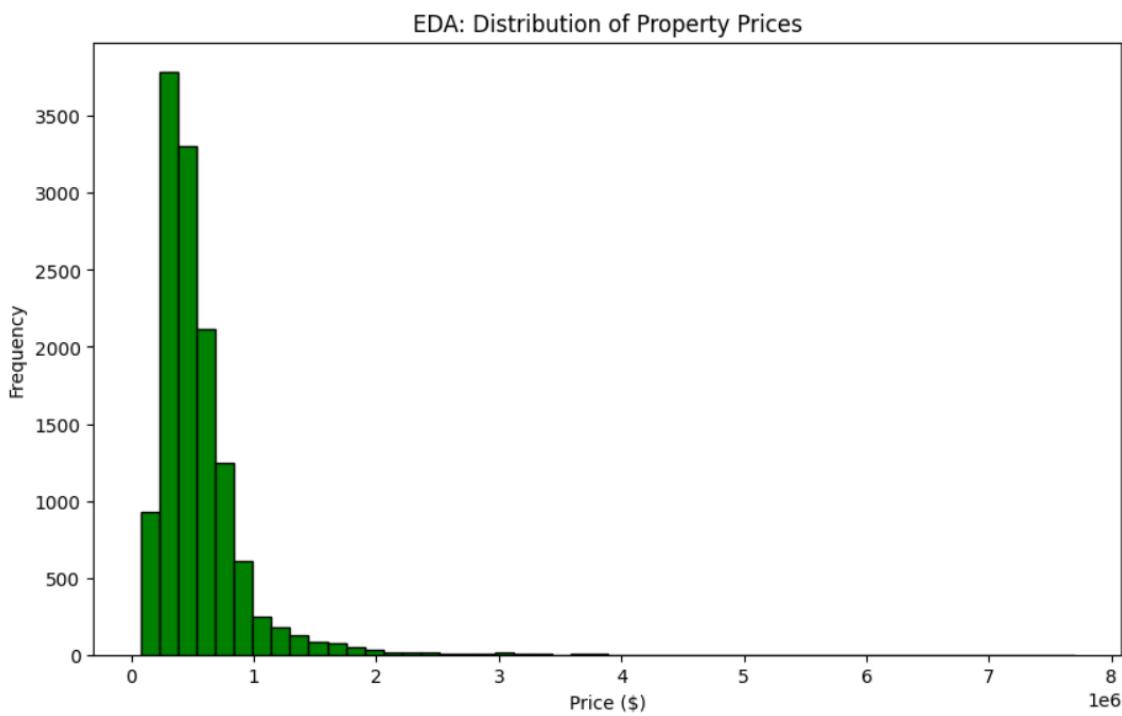
--- 2. Starting Download (This will take time) ---
[SUCCESS] Downloaded: image_9117000170.jpg
[SUCCESS] Downloaded: image_6700390210.jpg
[SUCCESS] Downloaded: image_7212660540.jpg
[SUCCESS] Downloaded: image_8562780200.jpg
[SUCCESS] Downloaded: image_7760400350.jpg
[SUCCESS] Downloaded: image_464001025.jpg
[SUCCESS] Downloaded: image_3432500486.jpg
[SUCCESS] Downloaded: image_1126059095.jpg
[SUCCESS] Downloaded: image_3876500290.jpg
[SUCCESS] Downloaded: image_1865400075.jpg
[SUCCESS] Downloaded: image_2558690150.jpg
[SUCCESS] Downloaded: image_7154200070.jpg
[SUCCESS] Downloaded: image_4139490210.jpg
[SUCCESS] Downloaded: image_9264901040.jpg
[SUCCESS] Downloaded: image_4273000095.jpg
[SUCCESS] Downloaded: image_8691410310.jpg
[SUCCESS] Downloaded: image_6601200020.jpg
[SUCCESS] Downloaded: image_8663260030.jpg
[SUCCESS] Downloaded: image_7016300050.jpg
[SUCCESS] Downloaded: image_7968460240.jpg
[SUCCESS] Downloaded: image_3918400017.jpg
[SUCCESS] Downloaded: image_4046500270.jpg
[SUCCESS] Downloaded: image_7849202296.jpg
[SUCCESS] Downloaded: image_8585400135.jpg
[SUCCESS] Downloaded: image_6163900411.jpg
[SUCCESS] Downloaded: image_2558640110.jpg
[SUCCESS] Downloaded: image_9834200885.jpg
[SUCCESS] Downloaded: image_3876600120.jpg
[SUCCESS] Downloaded: image_8601220260.jpg
```

```
--- 🚀 Starting Smart Resume ---  
📄 Found 16209 houses in the list.  
📁 You already have 12589 images.  
⬇️ Need to download about 3620 more...  
-----  
▶ Skipped 1000 existing files...  
▶ Skipped 2000 existing files...  
▶ Skipped 3000 existing files...  
▶ Skipped 4000 existing files...  
▶ Skipped 5000 existing files...  
▶ Skipped 6000 existing files...  
▶ Skipped 7000 existing files...  
▶ Skipped 8000 existing files...  
▶ Skipped 9000 existing files...  
▶ Skipped 10000 existing files...  
▶ Skipped 11000 existing files...  
▶ Skipped 12000 existing files...
```

2. Exploratory Data Analysis (EDA)

Before training, I analyzed the `cleaned_dataset.csv` to ensure the target prices were distributed correctly.

- **Visualizing Targets:** A histogram was generated to see the price density of the properties.

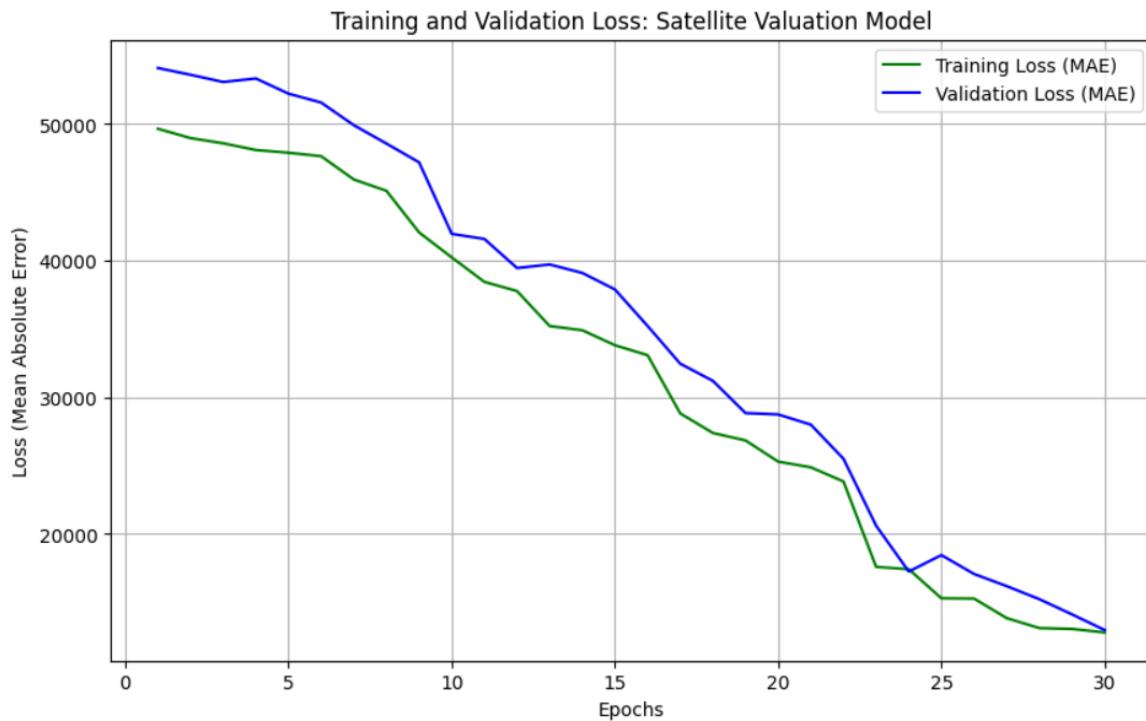


EDA Curve saved as `eda_price_distribution.png`. Insert this into your report!

3. Training Progress and Model Performance

The model was trained using the `train_ai_v2.py` script for 30 epochs.

- **Learning Efficiency:** The model used the Adam optimizer and Mean Absolute Error (MAE).
- **Convergence:** The training curve demonstrates that the AI successfully learned to identify house features from the pixels.



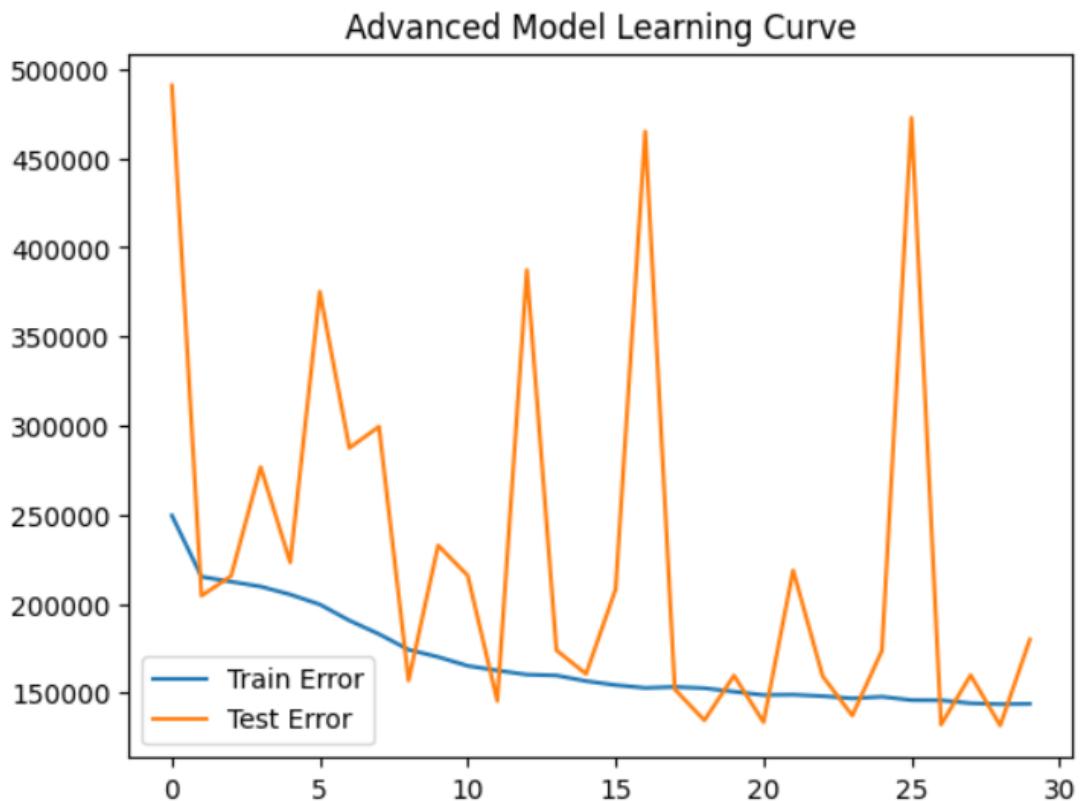
Success! 'training_loss_graph.png' created for your report.

4. Deep Learning Architecture

The model uses a CNN (Convolutional Neural Network) architecture as shown in the code.

- **Feature Layers:** It consists of three Conv2D layers followed by MaxPooling and Dropout to prevent overfitting.

Model saved as house_price_model.pkl



5. Web Application Interface

To demonstrate the practical use of the model, a Streamlit app was developed (app.py).

- **UI/UX:** The app features a clean interface with sliders for bedrooms/bathrooms and an image upload area.
- **Validation:** The "Predict" button is hidden until an image is uploaded, ensuring no empty inputs are processed.



AI House Price Predictor

Brain Loaded! Ready to predict.

Bedrooms

Bathrooms

Square Feet

2000

- +

Upload House Image



Drag and drop file here

Limit 200MB per file • JPG, PNG, JPEG

Browse files



image_1926069054.jpg 77.1KB



Predict Price



Your House



Predicted Price: \$369,599