

Development of A Hybrid Predictive Model by Using Images and Digital Data for Real Estate Market Value Estimation with Artificial Intelligence



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(Introduction)

“Real estate valuation plays a critical role in investment and decision-making. However, traditional methods rely mainly on numerical data and often ignore important visual factors such as property condition and design. This project proposes a hybrid AI model that combines both digital data and property images to deliver more accurate, transparent, and intelligent property value estimation.”

Short idea (Introduction)

Imagine someone
in Riyadh who wants
to buy a house...

Which price
is accurate?
What is the real
value?



 Riyadh Homes 



Al Yasmin District
Villa - 300 m²

2,450,000 SAR

[View Details](#)

 Aqar Online 



Al Yasmin District
Villa - 300 m²

1,850,000 SAR

[View Details](#)

 Home Finder 



Al Yasmin District
Villa - 300 m²

2,100,000 SAR

[View Details](#)

Different prices for the same area...

Which one is right?

Problem Definition

Real estate valuation is critical for investment decisions and economic stability, yet current models remain limited in accuracy. Despite advances in AI-based Automatic Valuation Models (AVMs), three key issues persist:

- **Lack of qualitative data** – Most models rely only on numerical factors (size, location, rooms), ignoring visual and contextual property features that influence real value.
- **Poor multimodal integration** – Images and structured data are often processed separately, preventing a unified understanding of property condition and characteristics.
- **Black-box limitation** – Advanced AI models often lack transparency, making it difficult to understand how valuation outputs are generated.
- **Overall**, existing valuation systems fail to effectively combine quantitative and qualitative information, leading to inconsistent and sometimes inaccurate pricing estimates. The research aims to address this gap by developing an integrated model that combines both data types for more reliable valuation.

problem summarization

Valuation models tend to lack an encompassing structure in linking property's quantitative aspects with its qualitative features. The absence of integration between these two aspects makes it difficult to interpret valuation figures as well as increases their inaccuracies. The present study seeks to bridge this gap by introducing a valuation model that incorporates both types of variables into the forecasting process.

The problem is not a lack of data... but rather that it leads to a negative impact







“This project develops a hybrid AI model that predicts real estate market value using both structured data—like location, size, and number of rooms - and visual data from property images.

The system doesn’t just rely on numbers... it visually understands the property to produce a more accurate valuation.”



I will use Houses Dataset in my project

HOUSES DATASET



RECLEDET



What does the system actually do?

Takes input from two sources:

 Digital data (price history, area, location, rooms...)

 Images (interior, exterior, finishing quality)

Processes them using AI:

Machine Learning model → analyzes numbers

Deep Learning (CNN) → analyzes images

Combines both (Hybrid Model):

Merges insights from data + images

Outputs:

 Predicted property price

 Confidence level

 Key factors affecting value

- ✓ Hybrid Model
- ✓ Explainable AI
- ✓ Human-like valuation

Input input



Digital data

Digital data		
Price data		
Area	Location	20%
Area		30%
rooms		
Susttion		
rooms...		

Presterypsystem



Exteroe
Sunfying Quality



Exteroe
Finishing Quality

AI- does prices



Machine Learning
Numbre data



Deep Learning (CNN)
Hybrides Model

PArogne bods



Merge insights both
images



Keys factors +
affecting value

My Project name (Clarivision) (كلاريفيجن)

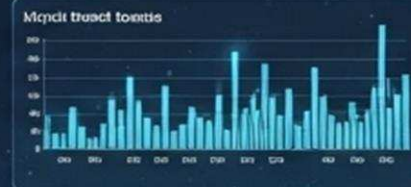
Clarivision System

AI



Hybrid Predictive Model Market Value Estimation

- Dashboard
- Analysis
- Report
- Setting
- Notification
- Help
- Logout
- Profile
- Feedback



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18.90%

19.30%

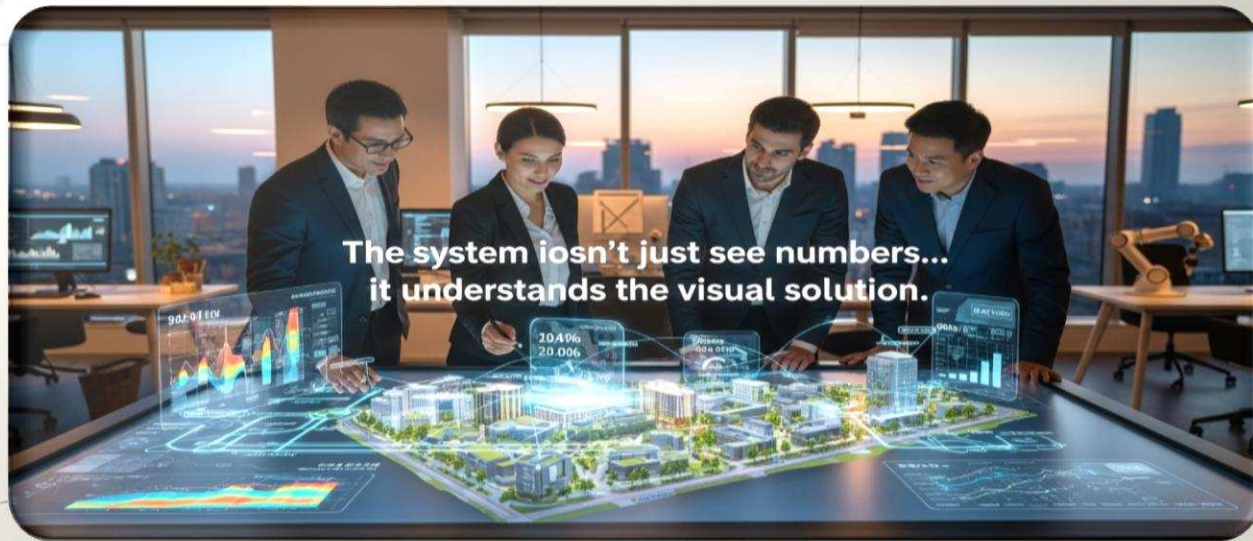
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Carivision

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- 96. Key Figures
- 97. Key Statistics
- 98. Key Data
- 99. Key Information
- 100. Key Details

why **Clarivision** system ?

“The system doesn’t just see numbers... it understands the visual solution”



“My project solves this problem using hybrid predictive model with AI”



“The system doesn’t just see the numbers... it visually understands the property”



“An intelligent system that sees, analyzes, and predicts property value.”



A fundamental question ?



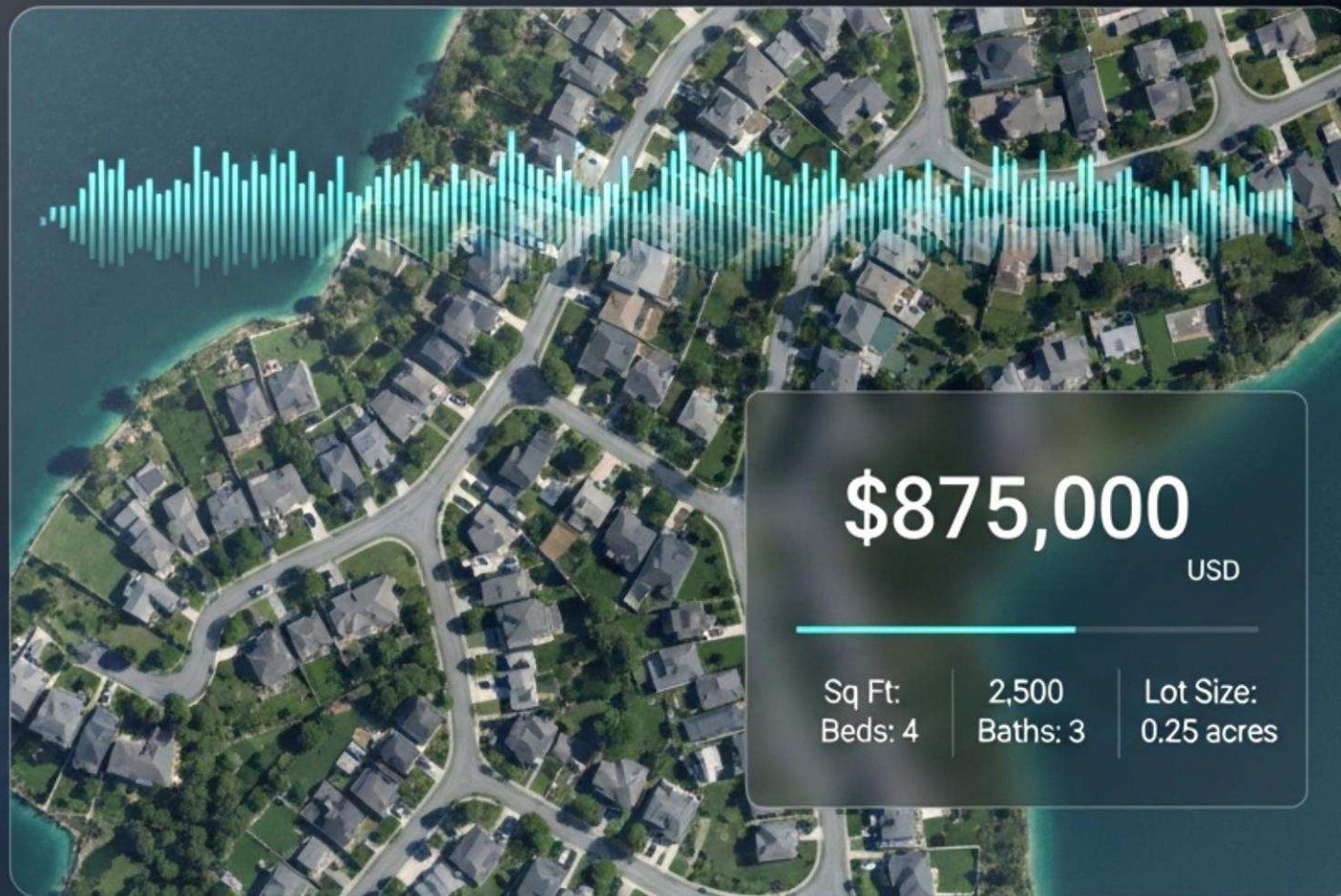
If you were offered two properties at the same price... could you make a decision within 10 seconds?



The system now analyzes the image...

and compares it to thousands of properties...

and gives the valuation within seconds



This isn't just a model...



It could be the start of
a smart real estate
appraisal that actually
implemented.

realestate



“Upon completion of the model, real-world scenarios will be simulated by introducing incomplete and noisy data. The model’s performance degradation will be evaluated to assess its robustness, and the results will demonstrate that the model maintains acceptable performance under such conditions.”



Thank you for listening and attending