EJAD
FACIAL RECOGNITION FOR LOST PEOPLE IDENTIFICATION

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INTRODUCTION

Getting lost during Hajj is a major challenge due to high crowd density, diverse languages, and similar landmarks, especially in Mina and Arafat. Vulnerable groups like the elderly and children face higher risks due to fatigue and congestion. Language barriers further complicate assistance. Innovative solutions, such as mobile apps, electronic wristbands, and facial recognition, offer efficient ways to identify and guide lost pilgrims. Despite existing efforts, there’s a need for more integrated tools tailored to Hajj’s unique circumstances.

PROJECT OBJECTIVES

- **Align with Saudi Vision 2030** by leveraging AI-driven solutions to enhance pilgrims' services.
- **Enhance the pilgrim experience** through faster and more efficient identification of lost individuals.
- **Improve crowd management** by integrating real-time face recognition for better organization and control.
- **Increase pilgrim safety** by ensuring quick and accurate identification, reducing risks in high-density environments.

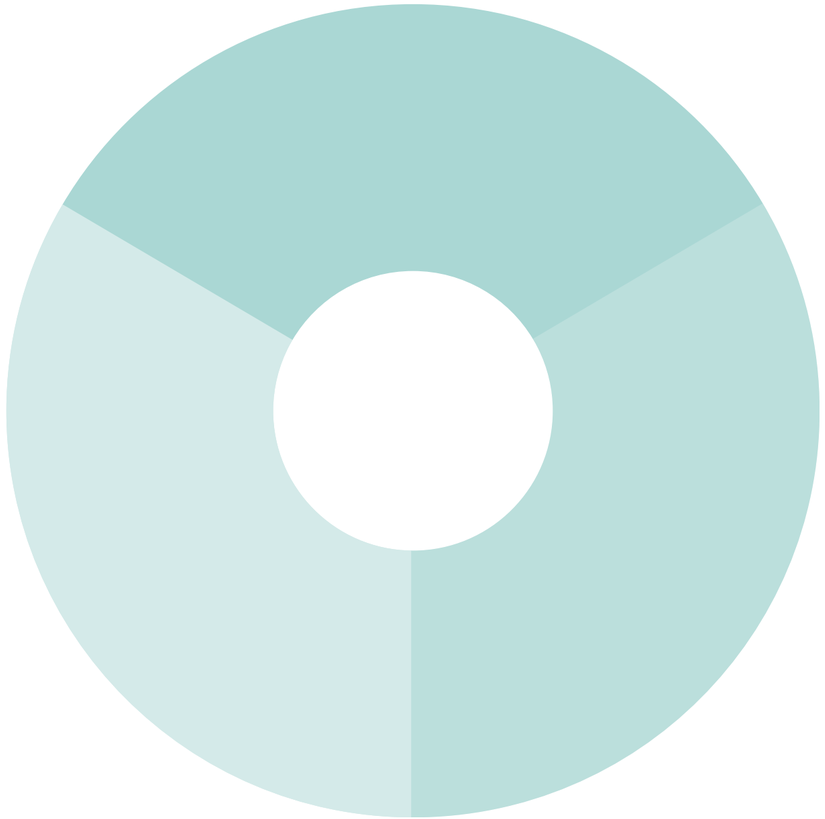
METHODOLOGY

DATA COLLETION

The study used Kaggle dataset with 4,000 facial images (2,000 males and 2,000 females) from diverse demographics was used. Images were resized to 128×128 pixels for model consistency.

PREPROCCESING

Images were normalized into matrices (pixel intensities [0, 1]) using One-Hot Encoding for pattern processing. Metadata was also encoded with One-Hot for structured data integration.



MODEL ARCHITECTURE

Three CNN architectures were designed and tested to classify facial images with synthetic metadata, varying in convolutional and dense layers to assess the impact of network depth on performance.

MODEL IMPLEMENTION

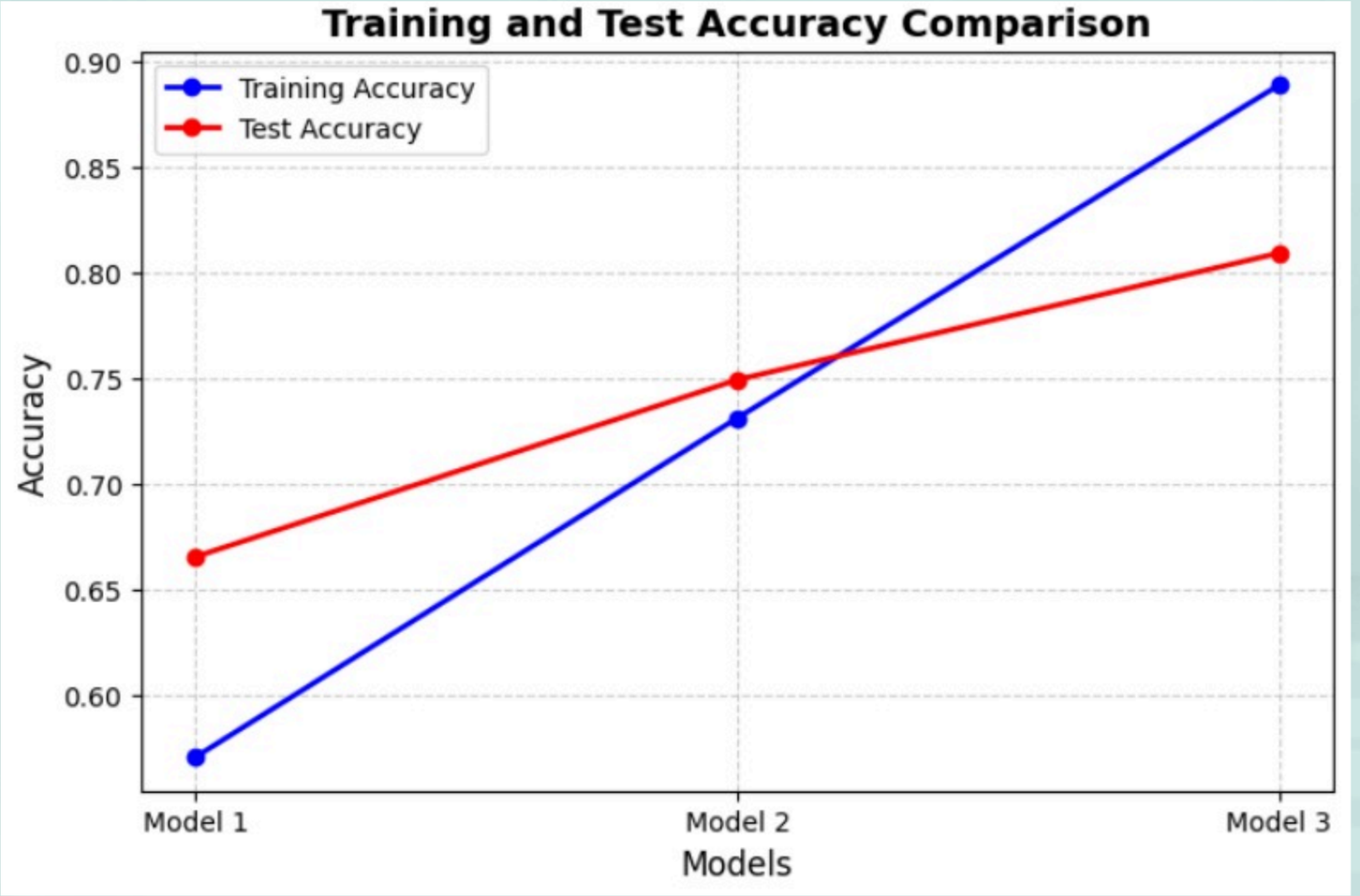
The models were built and trained using TensorFlow/Keras, optimized with Adam, and evaluated with Categorical Crossentropy for multi-class classification.

PREDECTION RESULTS

We evaluated our classification model by processing selected images with associated details. Predictions were compared with actual labels, showing high accuracy as names mostly matched. The results were presented in a structured format for easy assessment and verification.

MODELS EVALUATION

Model 1 performs weakly, likely due to low complexity. Model 2 balances training and testing accuracy well, making it stable. Model 3 achieves the highest accuracy but may overfit. While Model 3 excels, Model 2 is the most practical choice.



MAIN RESULT

When providing the path of a pilgrim's image, the system automatically processes it using a trained classification model to extract relevant details. It retrieves information such as name, country, campaign, supervisor, and supervisor's phone number, displaying them in a well-structured format for easy verification and reference.

S.W.O.T

SWOT ANALYSIS

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STRENGTHS

Many studies on face recognition helped create a reliable version of the project to help pilgrims and support the government.

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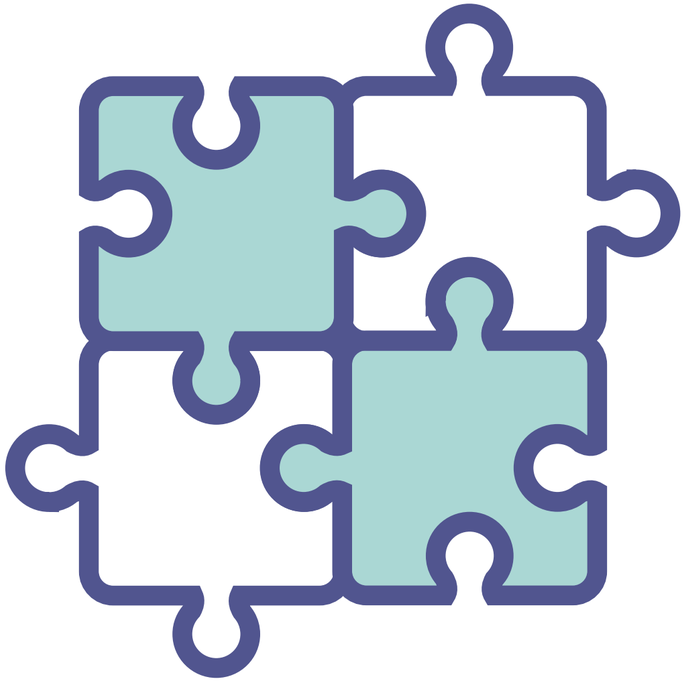
WEAKNESSES

Model 3 achieved high accuracy but showed signs of overfitting, meaning it might not generalize well to real-world data.



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THREATS

Some individuals and organizations may oppose facial recognition due to privacy concerns, religious beliefs, or legal restrictions, leading to potential legal challenges.

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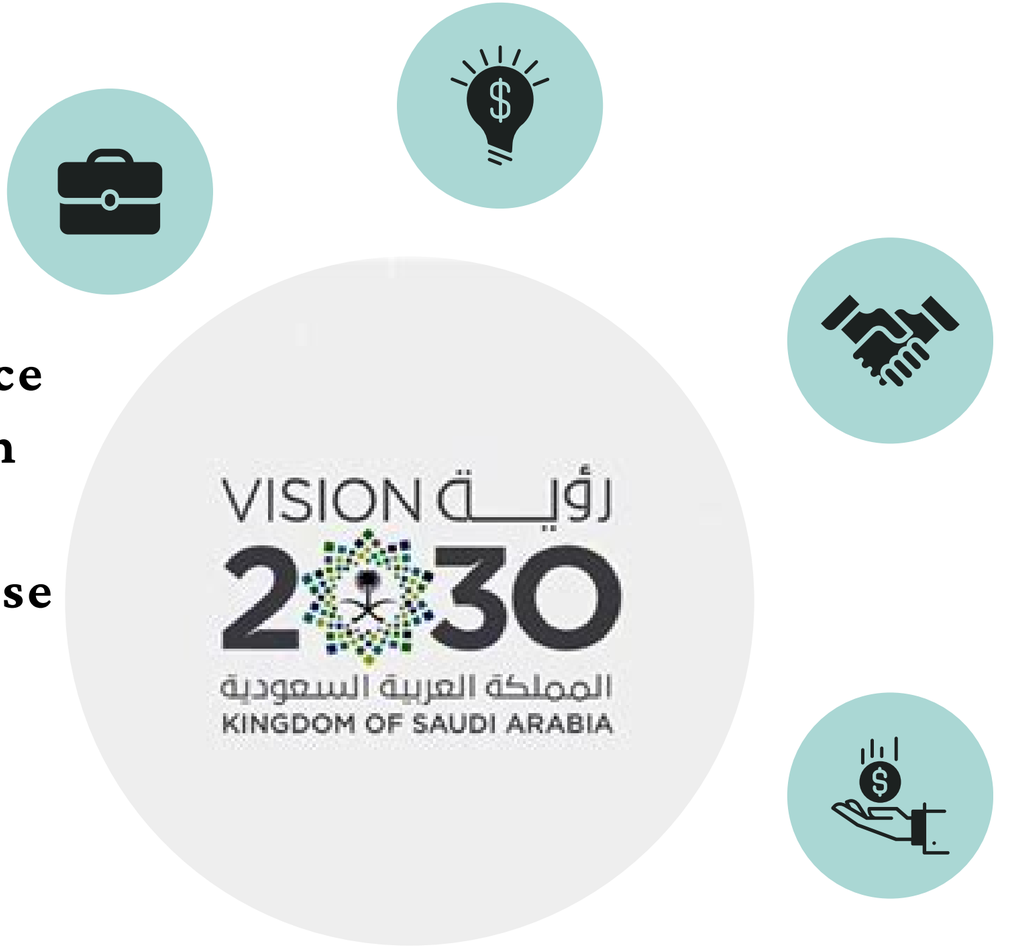
OPPORTUNITIES

The system can significantly reduce the time needed to find lost pilgrims, improving overall safety, especially for the elderly and children.

CONCLUSION

To improve our project, we will integrate real-time face recognition for faster and more accurate identification of lost pilgrims. Using high-quality, real-world data will enhance the model's accuracy and reliability. These improvements will help us achieve two key goals: supporting Saudi Vision 2030 through AI-driven solutions and enhancing the pilgrim experience by making the system safer and more efficient.



THANK YOU VERY MUCH!

ASK US ANYTHING