Facial Analysis for Personalized Jewelry Recommendations:
Jewelry Recommendation App: https://jewelrecs.streamlit.app/

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Summary: Exploring the synergy between machine learning and personalized fashion, this project utilizes OpenCV and MTCNN to power a jewelry recommendation app that analyzes facial features to suggest suitable jewelry. We assess the performance of this approach using a specialized dataset, comparing traditional and neural network models to refine accuracy and user experience.

Dataset: Face Shape Dataset from Kaggle, which includes 5000 images of female celebrities categorized by face shape.
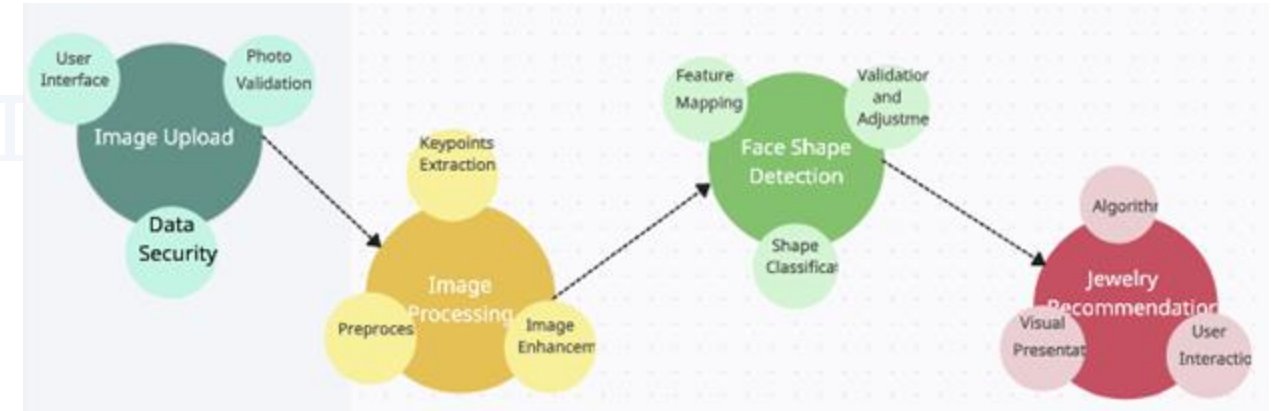
Model: MTCNN for initial face detection and keypoints extraction; additional experiments with a custom neural network model for comparative analysis.

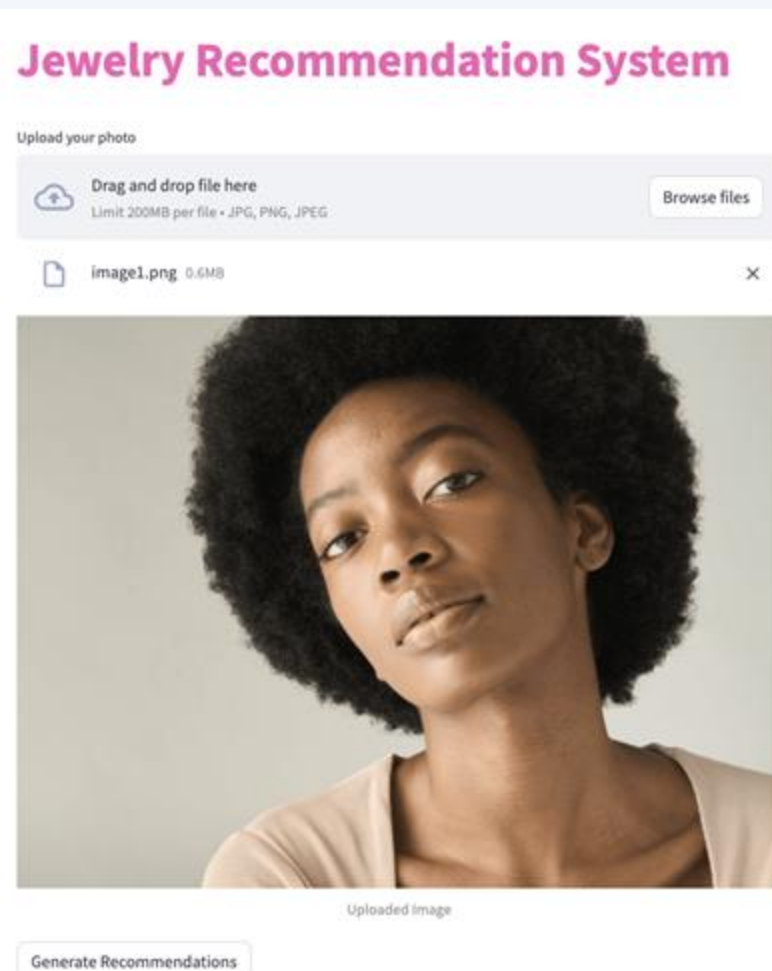**Tech Stack:** OpenCV & MTCNN integrated for enhanced face detection capabilities

Source:Medium

Workflow

User Interaction

Jewelry Recommendation System

Upload your photo

Drag and drop file here
Limit 200MB per file • JPG, PNG, JPEG

Browse files

image1.png 0.6MB

Uploaded Image

Generate Recommendations

Personal Features

Face shape: oval

Undertone Classification: warm

Color Analysis

Your dominant colors are:

Jewelry Design Recommendations

Drop earrings, hoops, or studs with elongated shapes

Layered necklaces or pendants with medium to long lengths

Bangle bracelets or cuffs to add symmetry to the face shape

Gemstone Recommendations

Gemstone Shape: Oval-shaped gemstones to enhance the face's symmetry

Gemstone Recommendation:

Citrine, garnet, or topaz to enhance warmer skin tones

Metal Color Recommendations

Yellow gold or rose gold to complement warmer skin tones

Methodology Section:

Part 1: Jewelry Recommendation App: Utilizes facial keypoints via OpenCV and MTCNN for accurate face shape detection, essential for personalized jewelry recommendations.

Part 2:Model Evaluation: Analyzes performance using a Kaggle dataset, assessing accuracy, precision, recall, and F1 score to ensure robust face shape classification.

Part 3: Additional Model Training
Explores an advanced neural network architecture to compare effectiveness against the primary model, aiming to enhance prediction accuracy and system reliability.

Results Section:

1.**Performance Comparison:** MTCNN outperformed the alternative neural network model, showcasing superior accuracy and reliability in face shape detection.

2.**Key Metrics Highlight:** MTCNN demonstrated the highest scores across all key metrics, including precision and recall, confirming its effectiveness in the jewelry recommendation application.

3.**User Satisfaction:** Feedback from user trials indicates a high level of satisfaction with the personalized jewelry recommendations provided by the MTCNN-based system.

	precision	recall	f1-score
Heart	0.20	0.99	0.33
Oblong	0.00	0.00	0.00
Oval	0.00	0.00	0.00
Round	0.00	0.00	0.00
Square	0.00	0.00	0.00
accuracy			0.20
macro avg	0.04	0.20	0.07
weighted avg	0.04	0.20	0.07

Accuracy: 0.1991991991991992