

Project Proposal for Research Methods Course

Spring Semester, 2025

Ben-Gurion University of the Negev

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1. Proposal Title

Detection of Facial Images Generated by Artificial Intelligence: Distinguishing Between Real and AI-generated Images Using Machine Learning.

2. Students Information

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3. General Description of the Problem

The aim of the research is to examine whether it is possible to reliably identify a difference between real facial images and images generated by artificial intelligence.

The central research hypothesis is that although AI-generated images are becoming increasingly realistic, there are still identifiable visual and statistical features that will allow computational models to distinguish them from real images.

The research questions include:

- Which features best distinguish between real and AI-generated faces?
- Which models or classification methods best fit the problem?
- How do human identification performances compare to those of the model?

4. Required Resources

- Image Databases: Collections containing both AI-generated and real facial images.
- Development Environment: Visual Studio Code (VS Code) for model implementation and experimentation.
- Human Participants: For comparison between human perception and AI model performance.

5. General Design of the Experiments

- Data collection and cleaning - using a balanced dataset of real and AI-generated faces.
- Model training - training multiple models on the dataset.
- Model evaluation - selecting appropriate metrics for performance evaluation.
- Model comparison - examining and comparing the results.
- Result interpretation - using tools to identify the features that contributed to the classification.
- Conclusion drawing - answering the research questions based on the findings.

6. General Description of the User Study

As part of the evaluation stage, a human perception experiment will be conducted in which participants will be asked to distinguish between real and AI-generated images.

The participants' results will be compared to the model's results in order to examine the gap between human perception and computational recognition.