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

4. Required Resources (Data and Code)

- Databases containing AI-generated and real images.
- VS-Code.
- Human resources for survey evaluation.

5. General Design of the Experiments

- Data collection and cleaning - using a balanced dataset of real and synthetic faces.
- Model training - training different models on the dataset.
- Model evaluation - selecting suitable metrics for performing evaluation.
- Comparison between models - examining the results and comparing them.
- Explanation of results - using tools to identify the features that contributed to the classification.
- Drawing conclusions - answering the research questions in light of 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 synthetic images.

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