

MINOR PROJECT (CS400M)



VIRTUAL TRY ON

*Under the supervision
of*

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PROBLEM STATEMENT

The project aims to create a Virtual Try-On experience that allows users to try on jewelry items such as necklaces, rings, earrings, bangles and frames. This application leverages computer vision techniques and deep learning models to provide a realistic and user-friendly experience. The problem addressed is the lack of an interactive and accurate virtual try-on tool in the jewelry industry, which can enhance online shopping experiences and reduce return rates.

Computer Vision?

Computer vision is a branch of artificial intelligence (AI) that focuses on enabling computers to interpret and understand visual information from the world, much like humans do. This field involves the development of algorithms and models that can process, analyze, and make sense of images and videos.

Deep Learning as a concept

- “Deep Learning” (DL) was coined by Hinton et al. [2] in the year 2006.
- A type of machine learning based on ANN in which multiple layers of processing are used to extract progressively higher level features from data.
- Deep learning is a process that learns the relation among two or more variables, governs the relation and the knowledge that makes sense of the relation. [3]

[2] Hinton GE, Osindero S, Teh Y-W. A fast learning algorithm for deep belief nets. *Neural Comput.* 2006;18(7):1527–54.

[3] Zhang, W.J et al. (2018). *World Automation Congress (WAC) – On Definition of Deep Learning.*

- Our project leverages advanced deep learning models like YOLOv8 to detect and classify jewelry items in images accurately.
- The deep learning models used in our project generalize well to new jewelry designs and user images
- Our deep learning approach significantly outperforms traditional computer vision techniques in terms of accuracy and robustness, ensuring precise detection and overlay of jewelry items on user images.
- The deep learning models are trained on a large dataset of annotated jewelry images, enabling them to learn intricate details and variations in jewelry designs, resulting in high-quality try-on results.

How was the model trained?

- The dataset was prepared by combining collected jewelry & frame images,
- The dataset was then cleaned eliminating any improper image.
- The cleaned data was then annotated. It involved careful placement and resizing of the boxes to match the shape and position of the human organs.
- YOLOv8, a state-of-the-art deep learning model for object detection, was selected for this task due to its high accuracy and efficiency in detecting and localizing objects in images.
- The YOLOv8 model was trained using the prepared dataset. The training process involved feeding the annotated images into the model, allowing it to learn the patterns and features associated with different types of jewelry
- The trained model was validated using a separate validation dataset to assess its performance. The images which had inaccuracies were re-annotated and the model was trained again with it leveraging reinforced learning

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