Jyothy Institute of Technology

Department of Artificial Intelligence and Machine Learning

Project Phase 2 Seminar(18AIP23)

Title:

Complementary Fashion Recommendation using Compatibility Modeling

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ABSTRACT

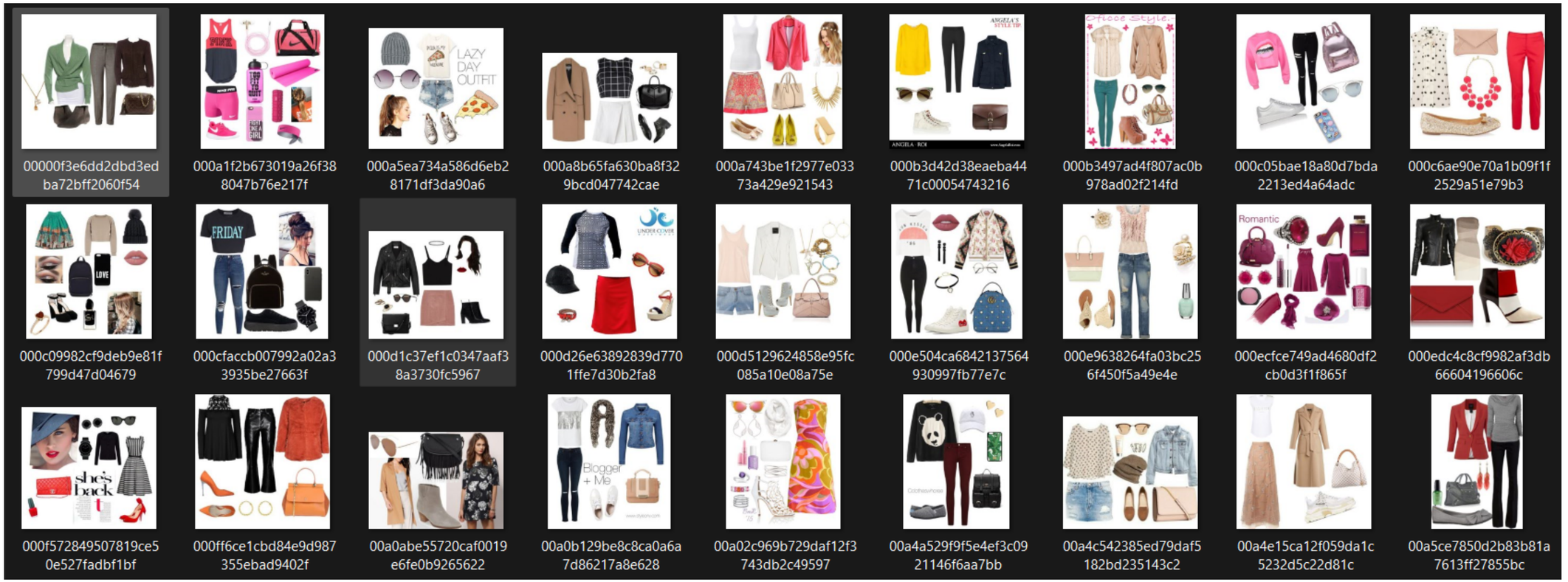
In the rapidly evolving eCommerce landscape, fashion retailers are confronted with the task of engaging customers virtually amidst unprecedented online spending. This project aims to address this challenge by introducing a specialized recommendation system focused on suggesting complementary items to complete outfits. By harnessing image style embeddings, the model predicts compatible products across diverse categories, providing retailers with a solution that doesn't necessitate extensive customer data.

INTRODUCTION

This project addresses the challenge of suggesting complementary items to complete outfits within the rapidly evolving digital retail landscape. The objective is to enhance the virtual shopping experience for fashion retailers and their customers. By leveraging compatibility modeling, retailers are empowered to offer curated selections that harmonize seamlessly. This approach minimizes reliance on historical customer data, providing a tailored solution to the evolving dynamics of digital retail.

METHODOLOGY

DATASET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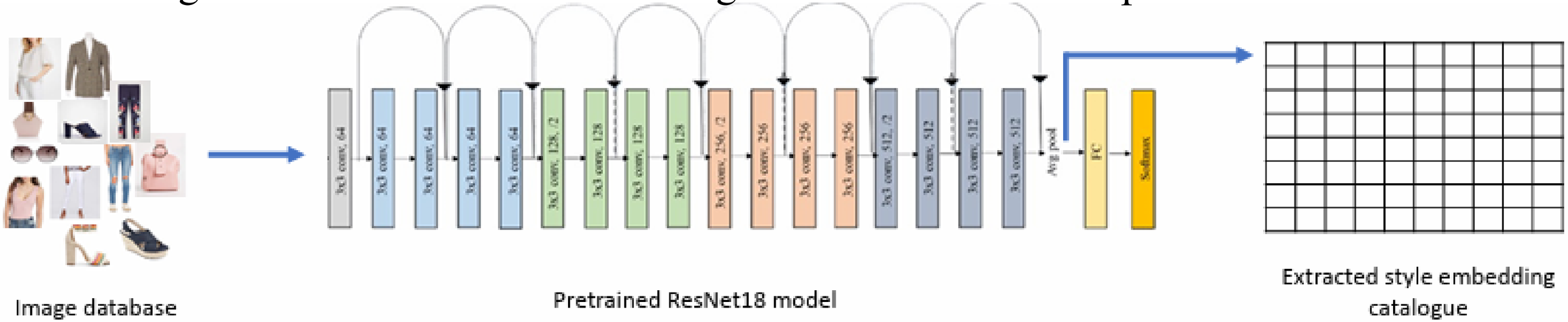
Step 1: Style Embedding Extraction for the Entire Image Database:

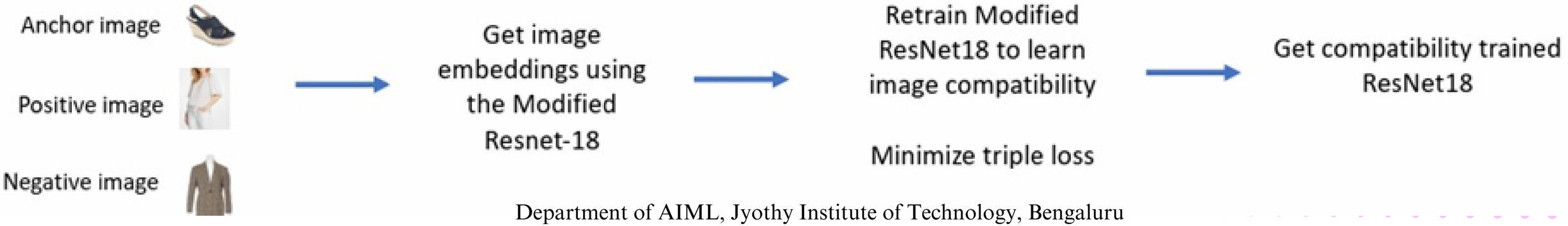
- The project initiates by extracting style embeddings from the entire image database. This process utilizes a Modified ResNet18 model to analyze each image and produce style embeddings.
- These embeddings act as concise representations of each product's visual style, cataloged for efficient retrieval during the recommendation process.



Step 2: Model Training Using Triple Loss

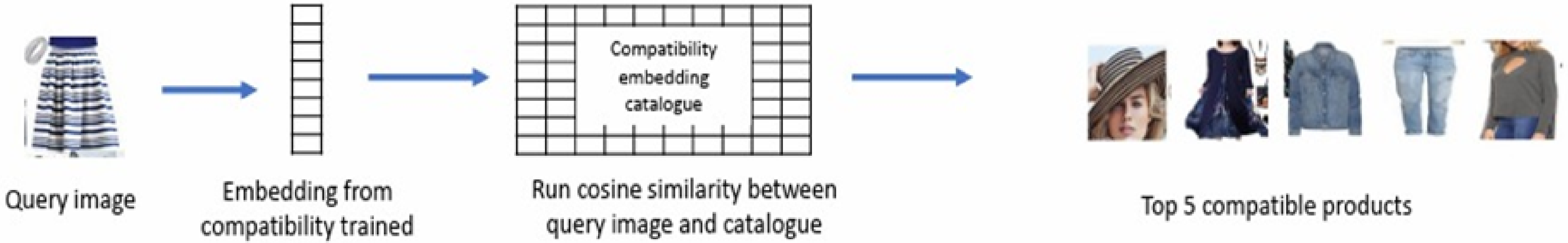
During this phase, the model learns image compatibility through training:

1. Anchor Images: We start with a reference anchor image.
2. Positive and Negative Images: Images with similar and dissimilar styles to the anchor are selected.
3. Image Embeddings: Each image undergoes processing to create embeddings using the Modified ResNet18 model.
4. Retraining: The model adjusts its parameters to minimize the triple loss, aiming to bring embeddings of similar images closer together.

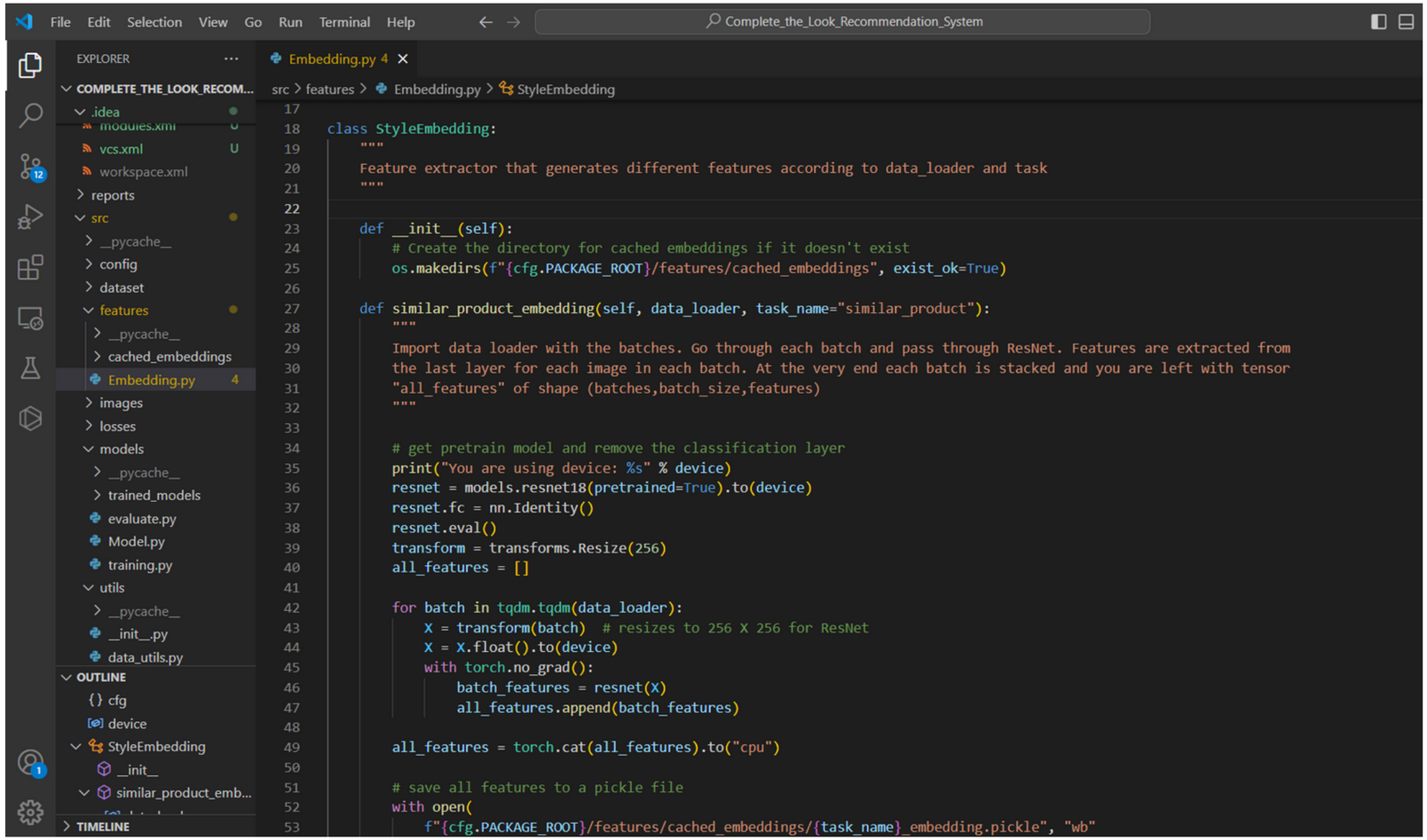


Step 3: Matching Query Image with Database

- Query Image Embedding: We extract the embedding of the user's query image using our Modified ResNet18 model.
- Comparison: This query image's embedding is then compared with the embeddings cataloged in step one.
- Cosine Similarity: We measure the similarity between the query image's embedding and the cataloged embeddings using cosine similarity.
- Results: The top 5 compatible images/products are retrieved from the database.



Code Implementation



Output


Input Image
Type: Shirts & Tops
Compatibility: 0.8886
Type: Skirts
Compatibility: 0.8667
Type: Shoes
Compatibility: 0.8666
Type: Coats & Jackets
Compatibility: 0.8658
Input Image
Type: Shoes
Compatibility: 0.9006
Type: Coats & Jackets
Compatibility: 0.8754
Type: Watches
Compatibility: 0.8634
Type: Jewelry
Compatibility: 0.8555
Input Image
Type: Coats & Jackets
Compatibility: 0.8935
Type: Handbags
Compatibility: 0.8897
Type: Socks
Compatibility: 0.8857

Next Phase Implementation

1. Frontend Development: Incorporate user-friendly interfaces to interact with the recommendation system.
2. UI/UX Enhancement: Refine the user experience by improving navigation and visual presentation.
3. Implement User Input: Allow users to input preferences or refine search criteria to enhance recommendations.
4. Fine-Tuning Algorithm: Refine the recommendation algorithm based on user feedback and testing results.

References

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Thank You