Project Proposal

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Project Proposal: Predicting Clothing Item Prices from Images

Area/Topic: This project predicts fashion item prices from images. The goal is to build a predictive model that takes images of clothing, shoes, and accessories and estimates their price category on a 5 point scale. The model will use existing datasets of fashion images and pricing information to train and evaluate its accuracy.

Research Statement: Can a machine learning model accurately predict the price range of fashion items based solely on visual features? This project will leverage image recognition techniques and machine learning algorithms to develop a price prediction model. By analyzing patterns in materials, design complexity, brand markers, and image aesthetics, the model will classify fashion items into five distinct price categories. This research could have applications in e-commerce, automated styling services, and consumer decision-making.

Method:

1. Data Collection: Utilize existing fashion image datasets with labeled price information (There is a dataset on “Kaggle”).
2. Preprocessing: Clean and normalize images, apply augmentation techniques to improve generalization.
3. Feature Extraction: Use convolutional neural networks (CNNs) for extracting deep visual features.
4. Model Selection: Train a supervised classification model (e.g., deep learning-based CNNs, transfer learning models, or ensemble methods) or XG Boost to predict price categories.

5. Evaluation: Assess performance using accuracy, confusion matrices, and F1-score metrics. Compare different model architectures to identify the most effective approach.
6. Interpretability: Use visualization techniques such as Grad-CAM to analyze which features contribute most to the model's predictions.

Potential Applications:

- Automated pricing assistance for online sellers.
- Price comparison tools for consumers.
- Market analysis for fashion brands.

This project will serve as a framework that can be refined into a full research study, integrating both machine learning methods and insights from fashion market trends. The results of such a predictive model could also be compared to a different dataset with human participants where the human participants predict the price of a product. Cross referencing the results, we can infer socioeconomic behavior and determine which characteristics make these items appear more expensive.