Project Proposal: Fashion Recommendations with In-depth Review Analysis

Team Members

- Yan Lu (Captain), NetID: yanlu5
- Ting Chen, NetID: tingc5

Free Topic Description

Task

"**Fashion Recommendations with In-depth Review Analysis**" is a project that aims to revolutionize women's online shopping by leveraging natural language processing and sentiment analysis on the "Women's E-Commerce Clothing Review" dataset. The goal is to provide personalized clothing recommendations by analyzing product reviews, reviewer demographics, and sentiments. An advanced recommendation engine, combined with an intuitive user interface, will enhance the shopping experience for users.

Importance and Interest

- **Enhancing User Experience:** This project strives to make online clothing shopping more convenient, enjoyable, and tailored to individual preferences, ultimately improving user satisfaction.
- **Personalization:** By offering highly personalized recommendations, the project aligns with the trend of personalized shopping experiences that resonate with users.
- **Rich Data Exploration:** Dealing with diverse data, including reviews, demographics, and product details, presents an opportunity for advanced data analysis and NLP techniques.
- **Real-World Relevance:** Addressing real industry challenges in e-commerce adds real-world relevance to the project.
- **Multidisciplinary Approach:** Combining NLP, data analysis, machine learning, and user profiling makes this project multidisciplinary.
- **Innovation Potential:** The project has the potential to push the boundaries of recommendation systems by incorporating sentiment analysis and demographic profiling.

Planned Approach

Objectives

1. Develop an advanced clothing recommendation algorithm.
2. Create user profiles based on demographics and preferences.
3. Implement an interactive user interface.
4. Evaluate the system's performance using relevant metrics.

Methodology

1. **Data Collection:** Extract relevant data from the "Women's E-Commerce Clothing Review" dataset.
2. **Data Preprocessing:** Clean and prepare the data for analysis.

3. **Recommendation Algorithm:** Develop and implement the recommendation algorithm.
4. **Integration:** Integrate the recommendation system with a user-friendly interface.

Tools and Systems

- **Programming Language:** Python
- **NLP Libraries:** NLTK, spaCy
- **Machine Learning Frameworks:** Scikit-Learn, TensorFlow
- **Web Development Frameworks:** Flask, Django

Datasets

- "Women's E-Commerce Clothing Review" dataset
- Additional data sources (optional)

Expected Outcome

- A functional clothing recommendation system.
- Summarized sentiment analysis for each clothing item.
- User profiles for personalization.
- An interactive user interface.
- Improved user satisfaction and engagement.

Evaluation Plan

- Offline Evaluation Metrics: Calculate precision, recall, and F1-score.
- Data Splitting: Divide the dataset into training and testing sets.
- Basic Cross-Validation: Implement basic cross-validation.
- User Testing and Feedback: Gather quick feedback.
- Documentation and Reporting: Document the evaluation process.

Workload Justification

The workload for this project is justified as follows:

- Data Preparation (10+ Hours)
- Algorithm Development (15+ Hours)
- User Interface Development (5+ Hours)
- In-Depth Evaluation (5+ Hours)
- Bias and Fairness Assessment (3+ Hours)
- Documentation and Reporting (2+ Hours)
- Iterative Refinement (ongoing, optional)
- Presentation Preparation (4+ Hours)
- Demo Preparation (3+ Hours)
- Unforeseen Challenges (variable)