An Experimental Study on Providing User Control in E-Commerce Recommendation through Conversational System

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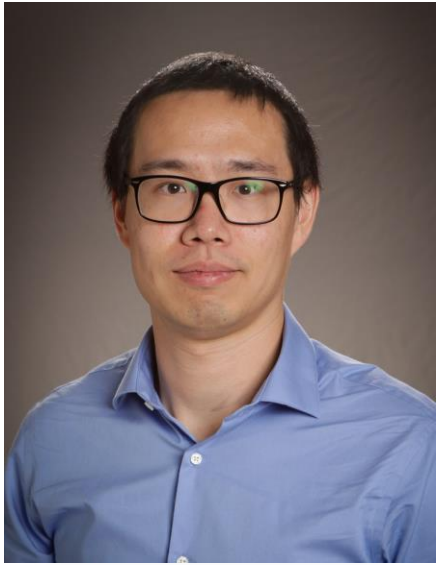
Presenter Information



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He is an Assistant Professor in the Department of Computer Science at Trinity University. He received his Ph.D. degree from the Department of Computer Science at Florida State University.

His research interests:

- Mobile Computing
- Cybersecurity
- Human Computer Interaction

He published papers in premier venues such as ACM CHI, ACM CCS, ACM MobiHoc, IEEE INFOCOM and ACM Ubicomp. His current projects include mobile safety system for distracted driver/pedestrian and mobile sensing for human computer interaction applications.

Presentation Roadmap

Introduction
- Current E-Commerce Recommendation System
- General proposal of *providing user control in E-Commerce recommendation through conversational system*

System Design
- Overview of the Recommendation and Conversational System

Experimental Study
- User Behavior Results
- Questionnaire Results

Conclusion

Current E-Commerce Recommendation System Challenges

Lack of diversity and transparency

- Creates “filter bubbles” and lead to polarization views
- Keeps recommendation process “behind the scences” which allow for little accountability

Lack of user participation

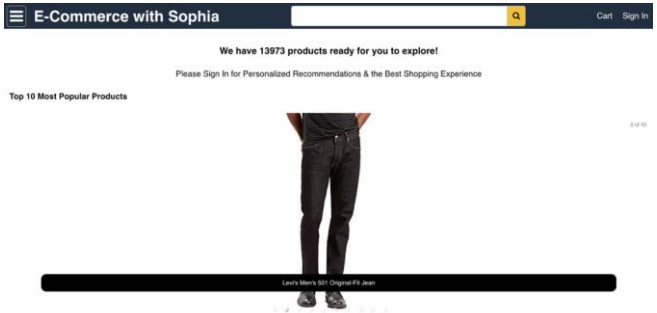
- Rarely offers users any explicit direct or participate in the recommendation process
- Dimish user trust and satisfaction and increase the bias of the recommnedation system

Research Question

- How do people view the conversational system as the control mechanism for e-commerce recommendation system?
- Which underlying algorithms do users prefer?
- Does it improve the diversity and transparency of the recommendation system?

System Overview

E-Commerce website and Data Set

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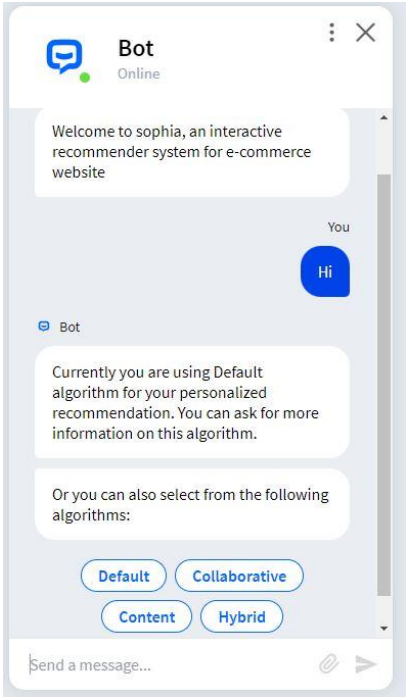
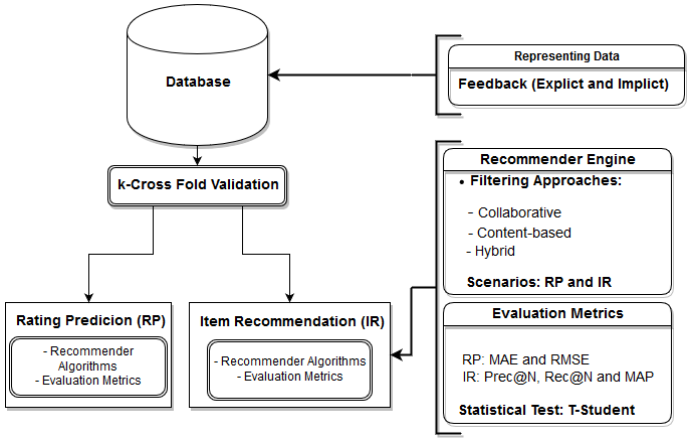
Recommendation and Conversational System

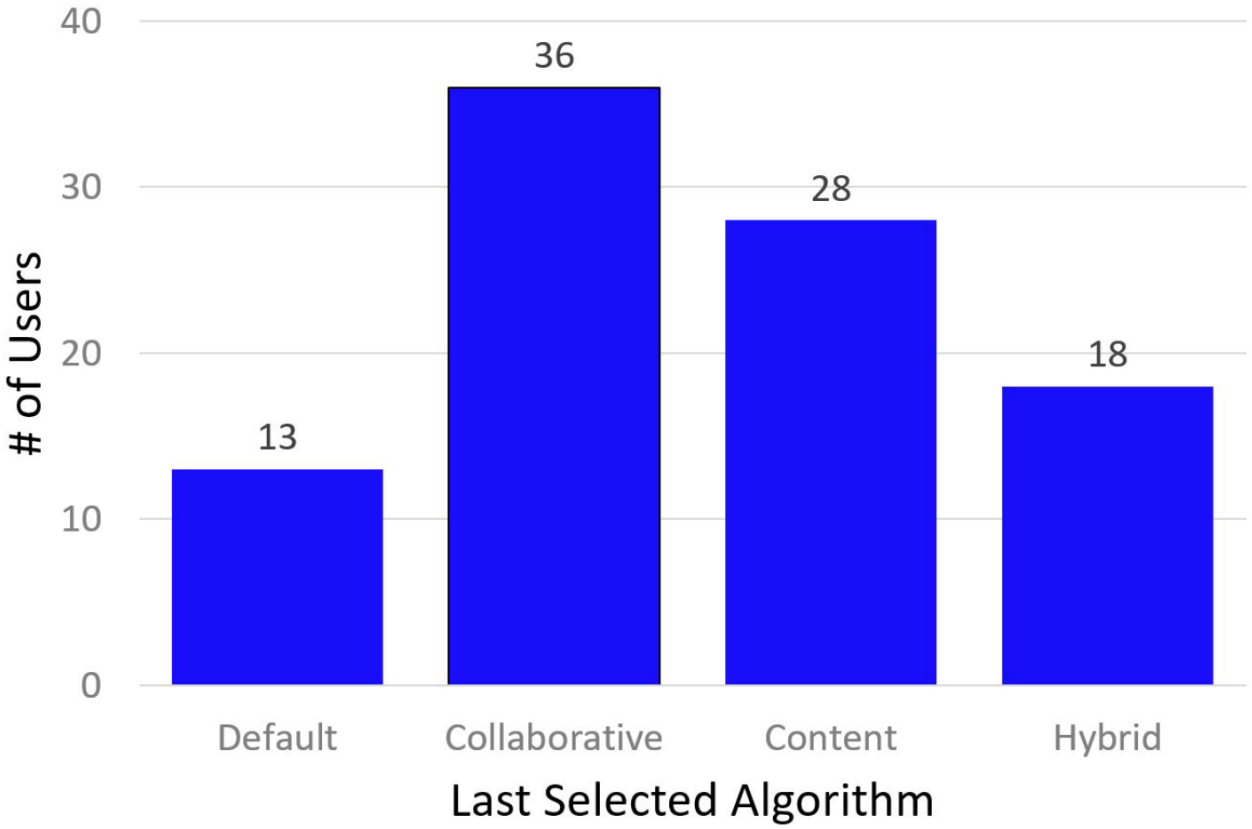




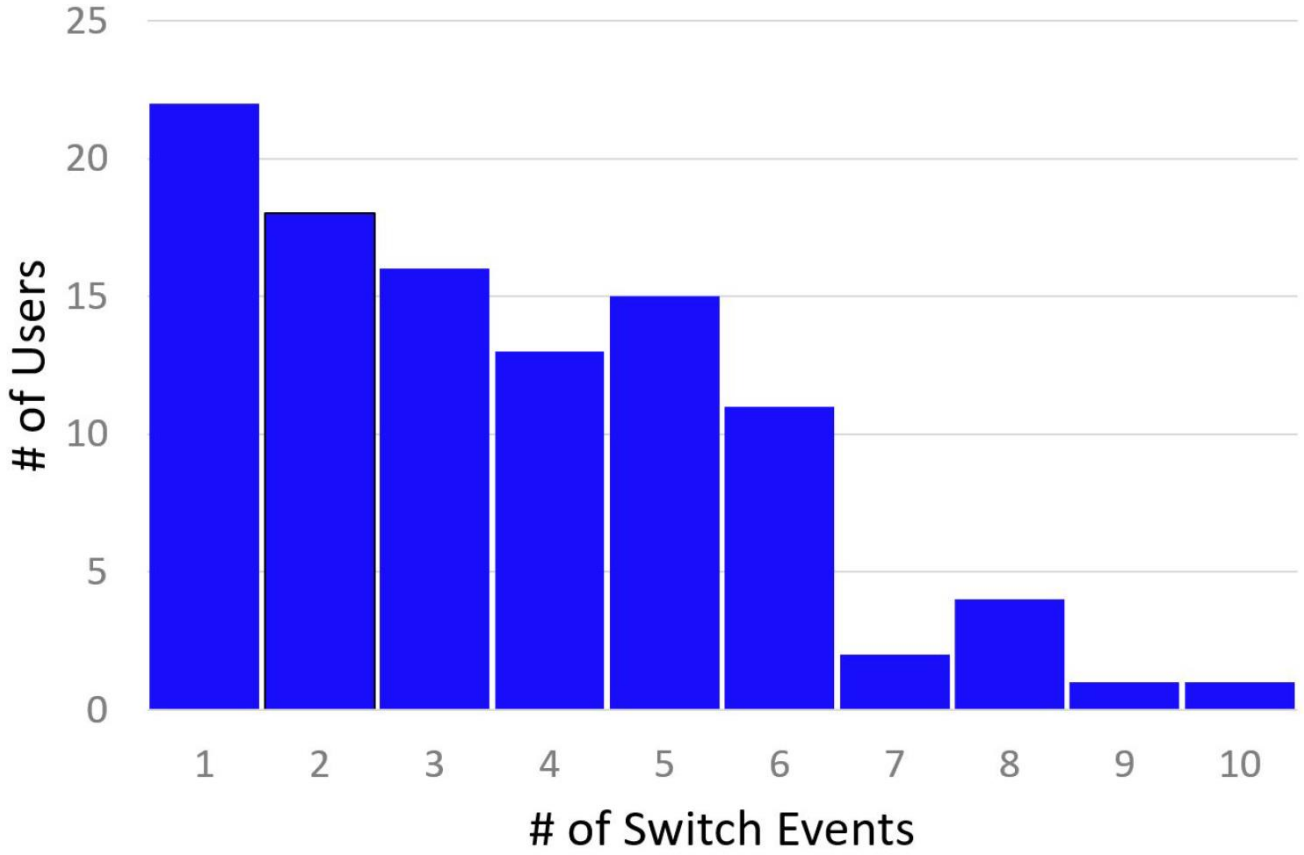
Experimental Setup

- 32. million reviews and 2.6 million products (clothing and shoes)
- Four supported recommendation algorithms:
  - Baseline
  - Collaborative
  - Content
  - Hybrid
- 108 users participants (45 female, 52 male, age from 21 to 50)
- 1315 change events recorded during the experiment
- 98 pieces of feedback collected for the after study questionnaire

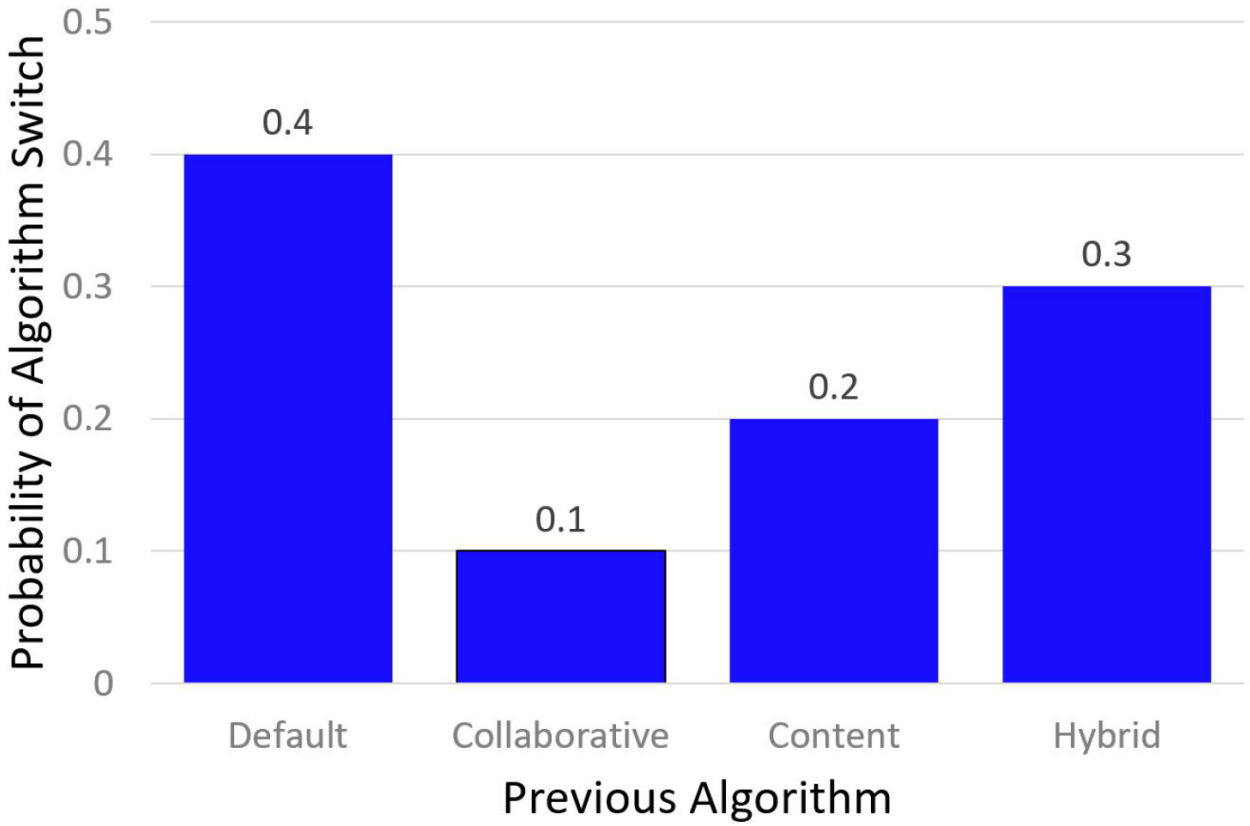
User Preferences of Algorithm



Events Count for User Switch



Likelihood of Switching Algorithm



Results of Post Study Questionnaire

Questions	Mean	SD
Q1: I become familiar with the system very quickly.	4.00	0.85
Q2: The information provided by the chatbot was sufficient for me to change the underlying algorithms/parameters.	3.95	0.82
Q3: I would like use this system in the future on e-commerce website.	4.15	0.74
Q4: I like the item recommendation result generated by the system.	3.85	0.92
Q5: I have fun when I am using the system.	4.12	0.63
Q6: The recommend results contained a lot of variety when switch to different algorithms/parameters.	3.65	1.25
Q7: The system has no real benefit for me.	1.68	0.88
Q8: I have to invest a lot of effort to obtain different recommendation results.	2.45	1.15
Q9: I feel in control of the recommending process.	4.08	0.72

Conclusion

- In this work, we implement an E-commerce Recommendation System using real-world product data and integrate a conversational system to enable user control over the recommendation process
- We also conduct a user study and questionnaire to gain insight into the following question: how od people view the conversational system as the control mechanism for E-commerce Recommendation System
- Results show that a majority of the user consider such an approach an excellent interface to achieve user control, diversity, and transparency. We also find that the collaborative filtering based algorithms is the most preferred algorithm.