

Catalyzing Social Interactions in Mixed Reality using ML Recommendation Systems

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ABSTRACT: We create an innovative mixed reality-first social recommendation model, utilizing features uniquely collected through mixed reality (MR) systems to promote social interaction, such as gaze recognition, body language, proximity, environment, and device type. We compare these results to the state-of-the-art recommendation methodologies which have not previously been applied to MR. We further extend these models to include right-time features to deliver timely notifications. By creating a new intersection of user features, MR features, and right-time features, we observe a significant boost in performance.

KEYWORDS

mixed reality, social networks, recommendation systems, collaborative filtering.

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1 INTRODUCTION

[TODO]

2 BACKGROUND

[TODO]

3 METHODOLOGY

[Tentative plan below]

We wish to conduct a study which collects data from real-life participants to enable the prediction of three output classes – “Want to meet (in person)”, “Want to chat (via instant messaging)”, and “Reject”. These classes represent the different choices that users can make when they receive a recommendation.

We assume that future technology will allow users to set their privacy preferences specifically on a MR device, such that their profiles are only publicly visible if they so choose. Consider the sample scenario below:

“You see user123 sitting at a bar and notice that they have glanced at you a couple of times. They go to the same university as you. Do you:”

- A. Want to meet (in person)?
- B. Want to chat (via instant messaging)?
- C. Reject.

In the prior scenario, the study participant is asked to decide whether or not they want to interact with user123. The underlying assumption is that user123 has chosen to publicly share their profile, including which university they attend, with other users within some local proximity. Scenarios measuring social interactions in mixed reality assume the consent of both parties involved. These scenarios will be presented to users in our study to measure various data points about the underlying intricacies of the future of social interaction.

The collected data will include MR-related features (e.g., gaze, body language, proximity, environment, device type), ~~non-MR~~ user features (e.g., profile picture, hobbies, personality), and right-time features (e.g., location, time of day, audio environment, conversation intensity), described through our scenarios. For instance, in the scenario described above, glances serve as a proxy for gaze, which would be recorded by an MR device via heatmaps.

We will create four models, trained on four different subsets of the features:

1. ~~Non-MR~~ User features only.
2. ~~Non-MR~~ User features and MR features only.
3. ~~Non-MR~~ User features and right-time features only.
4. ~~Non-MR~~ User features, MR features, and right-time features.

4 EVALUATION

[Tentative plan below]

- Two of the four models we produce which are trained excluding MR features are similar to existing recommendation systems, whereas the other two models which include MR features are our novel recommendation models.
- Performance metrics of these four model types will be evaluated, comparing the models that include/exclude MR features and the models that include/exclude right-time features.

5 RESULTS

[TODO]

6 DISCUSSION

[TODO]

RELATED WORK

[TODO]

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REFERENCES

[1]