BlahBlahBot: Facilitating Conversation between Strangers using a Chatbot with ML-infused Personalized Topic Suggestion

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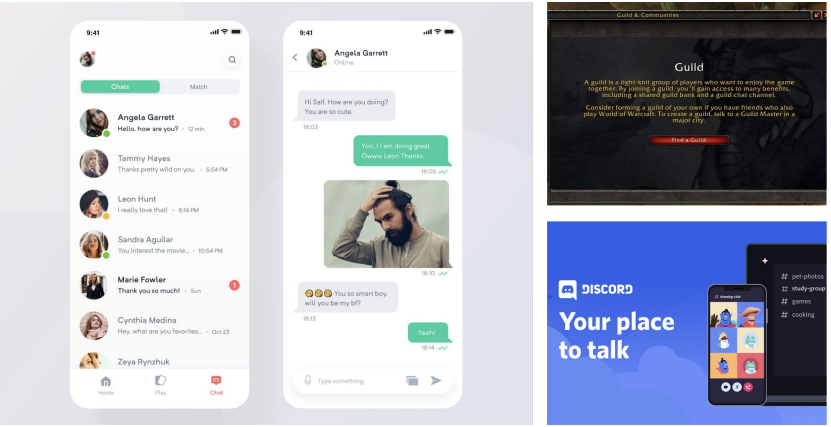
Defining Problem Space

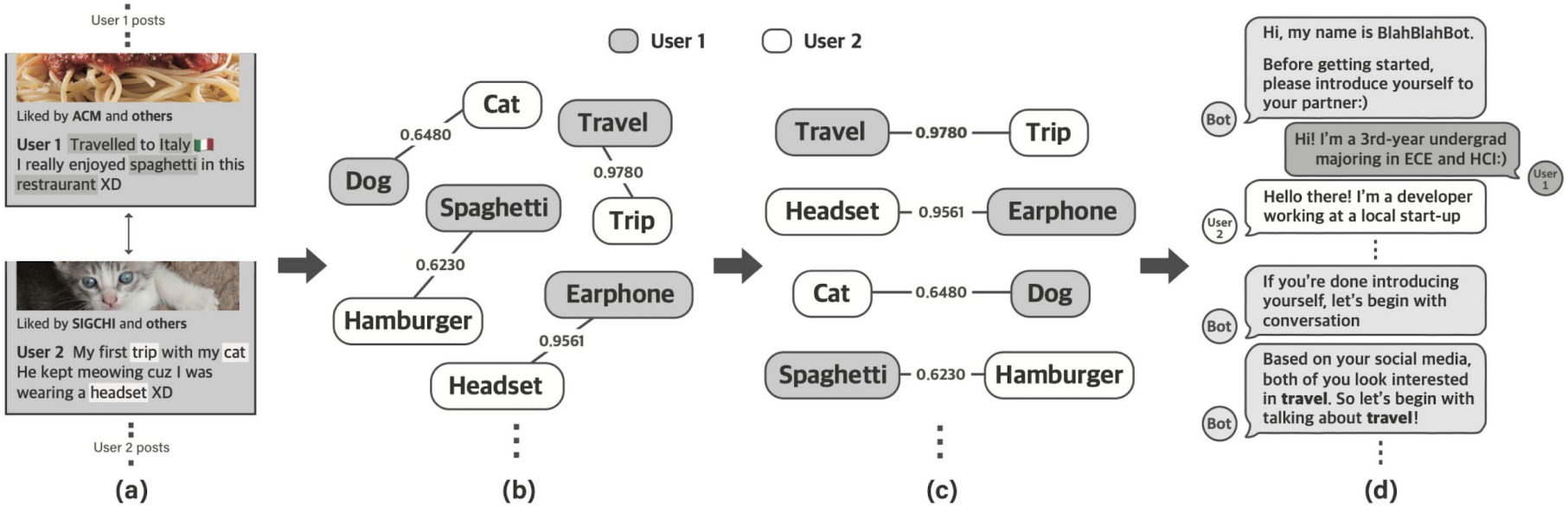
- Having a chat and building a relationship in **online settings** is prevalent
- In such settings, however, people often find it difficult to initiate and maintain a conversation with new acquaintance due to the **lack of predictability** *(Duronto et al, 2005)*



Our Motivation and Approach

- Previous studies focused on mediating face-to-face conversation with **manual topic collection and suggestion** *(Jarusriboonchai et al, 2015; Nguyen et al, 2015)*
- Based upon the idea that **user-generated posts in social media reflect the users' daily life interests** *(Cheung et al, 2015)*, we aimed to design an ML-infused chatbot that **automatically recommends conversation topics** that are of mutual interests with **users' social media posts**

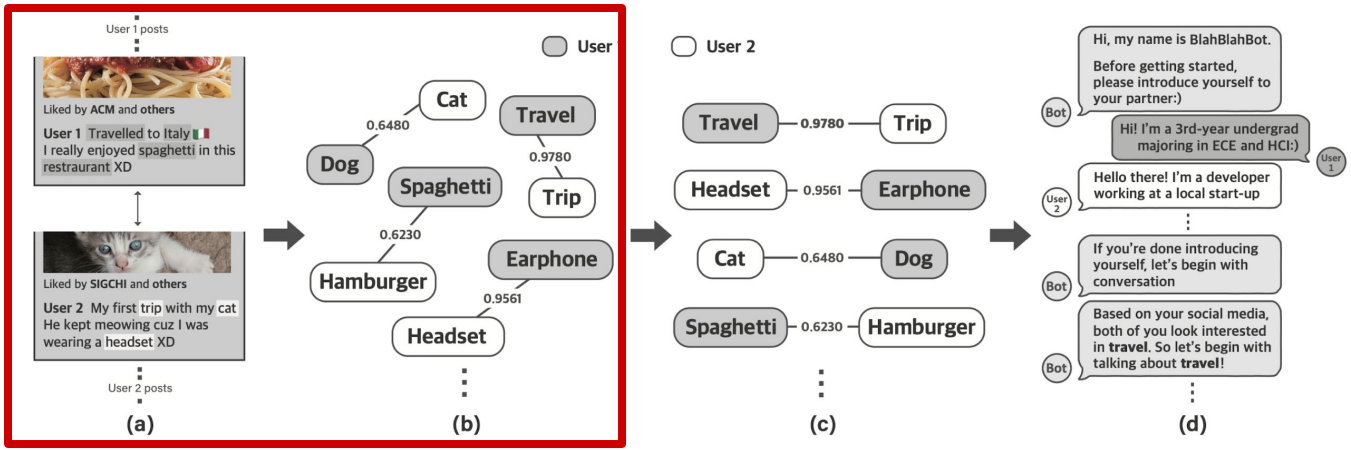
Design of BlahBlahBot



Design of BlahBlahBot

(a) **Extracts keywords** from each user's **social media posts**

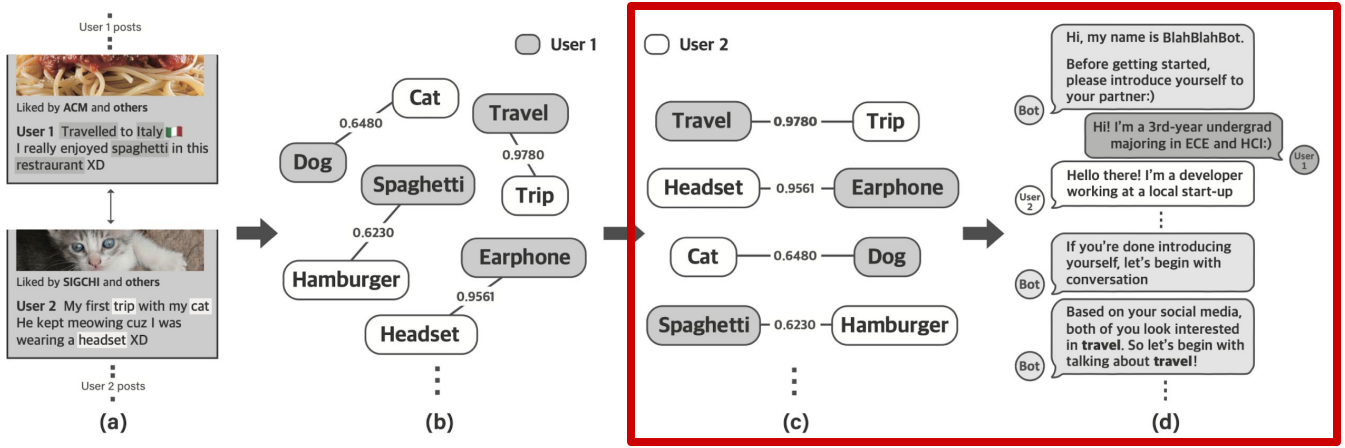
(b) **Vectorize** keywords with a **pre-trained model**



Design of BlahBlahBot

(c) **Matches each word** and **sorts out the closest word pairs** by semantic similarities

(d) Moderates conversation by **suggesting highly ranked topics** into **scaffolded question formats** (e.g., *"Based on your social media, both of you look interested in [TOPIC]."*)



Consideration on User Agency

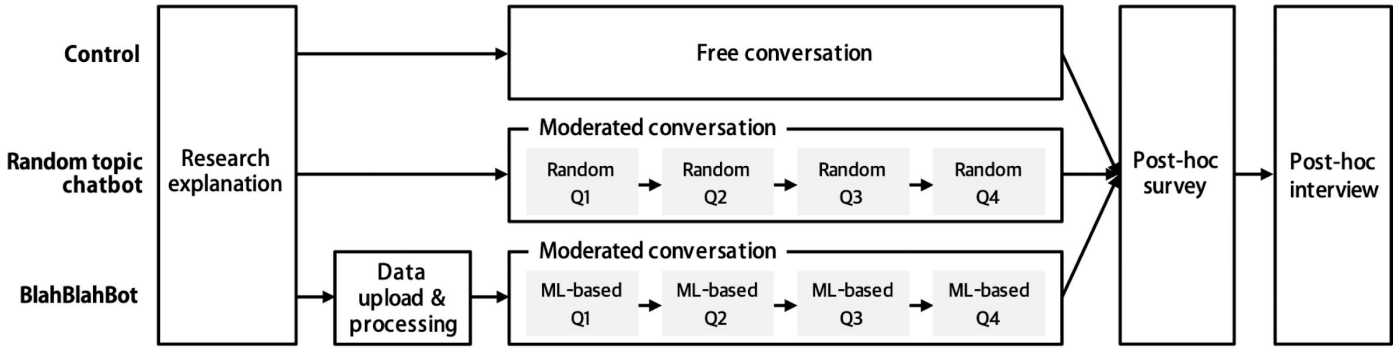
- Even if the model may show highly accurate topics, there still exists possibility that **users may face unwanted topics**, which may disrupt conversation *(Kytö & McGookin, 2017)*
- BlahBlahBot lets users **choose topics among among 20 candidates** and **prioritizes mutually chosen candidates**
- **Mutually exclusive topics** are programmed to be **shown later**, so that users may keep their conversation flawless at the initial phase

Implementation of BlahBlahBot

- Crawls post from each user's **Instagram** feed
- **Extracts free morphemes** and **remove stopwords**
- Embedded words with **Word2Vec** model pre-trained with **Korean Wikipedia corpus**
- Utilized **KoNLPy** to extract free morphemes and uses **Gensim** to get Word2Vec weights
- Deployed as an **iOS** application

User Study: Logistics

- We recruited **18 participants** by posting an announcement on the online community website
- We used a **between-subject design**, assigning six participants to each of the following conditions randomly: **Control** (no moderation), **Random topic suggestion** (pre-defined random topic suggestion), and **BlahBlahBot** group
- Two participants who do not know each other were matched as a pair and took part remotely

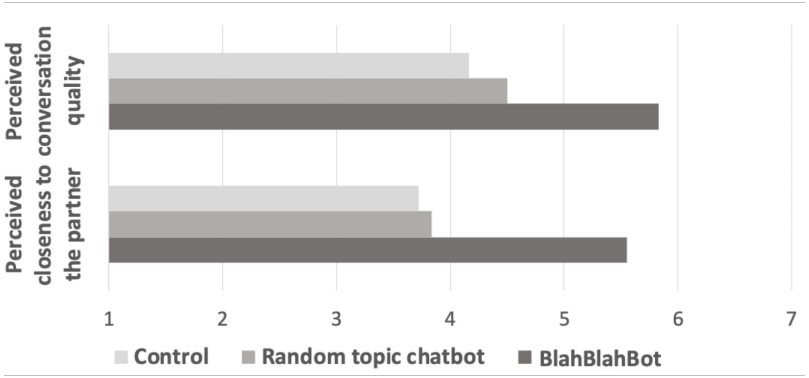


User Study: Measurement

- The goal of topic suggestions in BlahBlahBot is to support strangers by **facilitating conversation** and **inducing them to be closer**
- Thus, we decided to measure **conversation quality** and **closeness to the partner** for assessing the efficacy of our chatbot *(Burgoon & Hale, 1987)*
- Each participant was asked to rate the questions of each measure based on **7-point Likert scale**, and the scores were **averaged to measure the overall conversation quality** of each participant
- We also gathered **qualitative responses** using open-ended questions to gain richer insight into the user perceptions and attitudes toward our system

User Study: Quantitative Results

- **BlahBlahBot** users showed the **highest score in both conversation quality and closeness to the partner**, followed by the Random topic suggestion groups and Control groups
- Participants who used BlahBlahBot **exchanged messages with the partner the most**, followed by Random topic suggestion groups and Control groups



	Mean	SD
BlahBlahBot	176.3	34.5
Random topic suggestion	96.7	32.3
Control	93.3	43.9

[Average number of exchanged messages]

User Study: Qualitative Results

- From the post-hoc interview sessions, we identified **several factors** that led **BlahBlahBot groups' increases** in **perceived conversation quality and perceived closeness to the partner**

Metric	Self-reported cause of increase
Perceived conversation quality	1. Satisfaction on the suggested topics 2. Prevention of unwanted topics 3. Prioritization between common and mutually exclusive topics 4. Prior relief on the system
Perceived closeness to the partner	1. Time efficiency 2. Satisfaction on the suggested topics

Discussion & Future Works

- Our results revealed that **strangers who were recommended with topics based on their social media data** evaluated the **quality of the conversation higher** and **felt closer to the partner**
- Considering the modality of the text-based conversation, we believe the **extensibility of our work to other online-based services**, such as gaming platforms and dating apps, where the text is a predominant medium of interpersonal conversation
- **User study with more participants** in terms of generalizability is needed
- Further investigation when **other communication methods (e.g., voice, photo) are also available** along with the text is required

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THANK YOU!

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