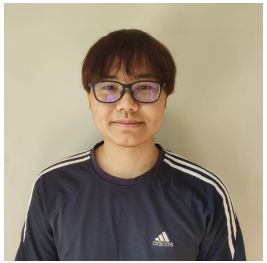
Interactive ChatBots for Software Engineering: A Case Study of Code Reviewer Recommendation

SNPD2021 Fall



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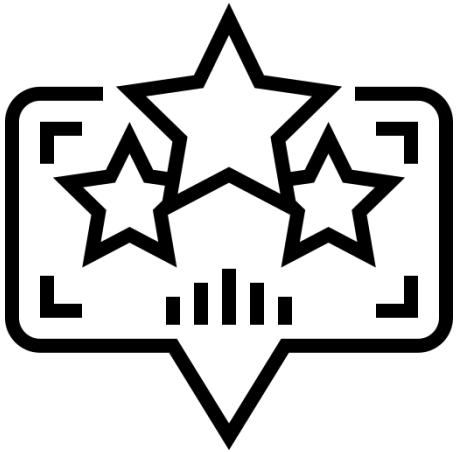
Goal of the Presentation

- Recommendation System
- ChatBots
- Combination of ChatBots and Recommendation System
- Reviewer Recommendation
- Our Approach
- Next Step of ChatBots

Recommendation System



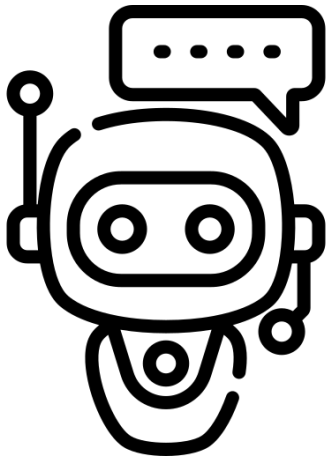
Using **historical data**, recommendation systems typically return a **ranked list of recommendations** based on **certain objectives**.

Recommendation Systems Play Large Role in the Software Engineering Research

There are many recent research that focus on recommendation system in software engineering

- Team recommendation system (Tuarob et al., 2021)
- Developer recommendation (Zhang et al., 2020)
- Third party library recommendation (Li et al., 2021)
- Python API recommendation (He et al., 2021)
- Github Topic Tag recommendation (Izadi et al., 2021)

ChatBots



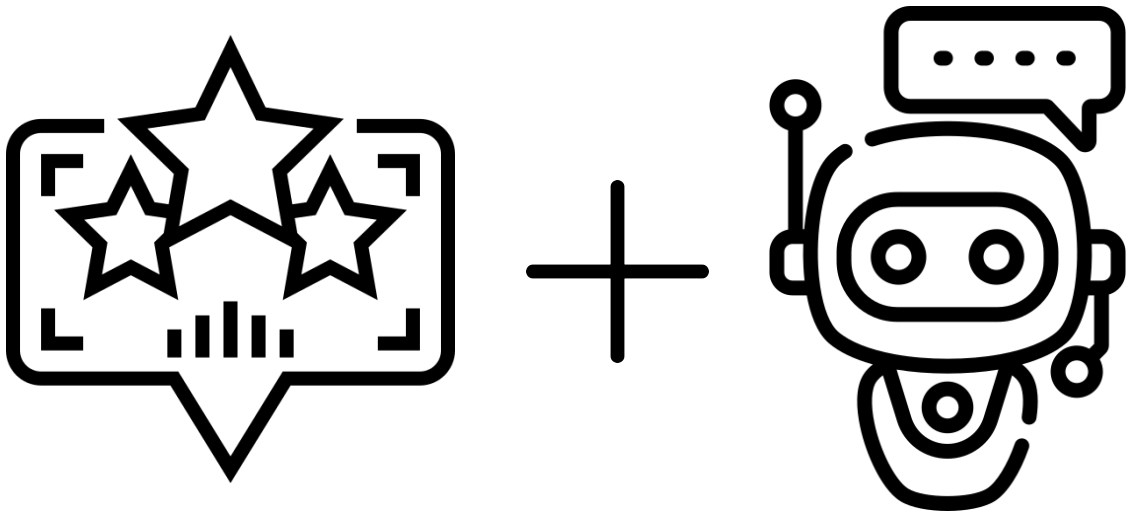
ChatBots are envisioned to dramatically change the future of Software Engineering, allowing **practitioners** to **chat and inquire** about their **software projects** and **interact** with **different services** using **natural language**. (Abdellatif et al., 2021)

User Case of ChatBots in Software Engineering Research

There are many recent research that focus on ChatBots in software engineering

- MSABot (Lin et al., 2020)
- PerformoBot (Okanovi´c et al., 2020)
- Bot for gathering the software requirements (Dwitama et al., 2020)
- OpenAPI Bot (Ed-Douibi et al., 2020)
- ChatBot system that can recommend experts for a software development task. (Cerezo et al., 2019)

Combination of ChatBots and Recommendation System



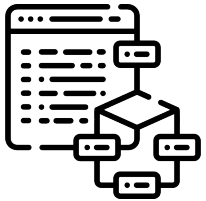
Case Study on Reviewer Recommendation

Recent studies proposed the approach of reviewer recommendation using various techniques which can be categorized into three types.

- Heuristic
- Machine Learning
- Hybrid

Case Study on Reviewer Recommendation (Cont.)

Heuristic Approach



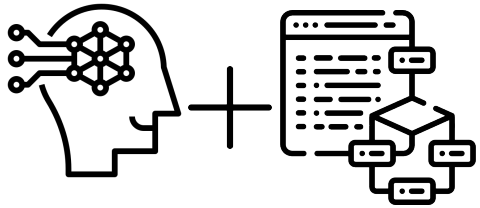
- File location (Thongtanunam et al. ,2015)
- Load balancing and File location (Asthana et al., 2019)
- Software artificial network (Sülün et al., 2021)

Machine Learning Approach

- Multi-objective meta-heuristic algorithm (Al-Zubaidi et al., 2020)
- Genetic Algorithm (Chouchen et al., 2021)

Case Study on Reviewer Recommendation (Cont.)

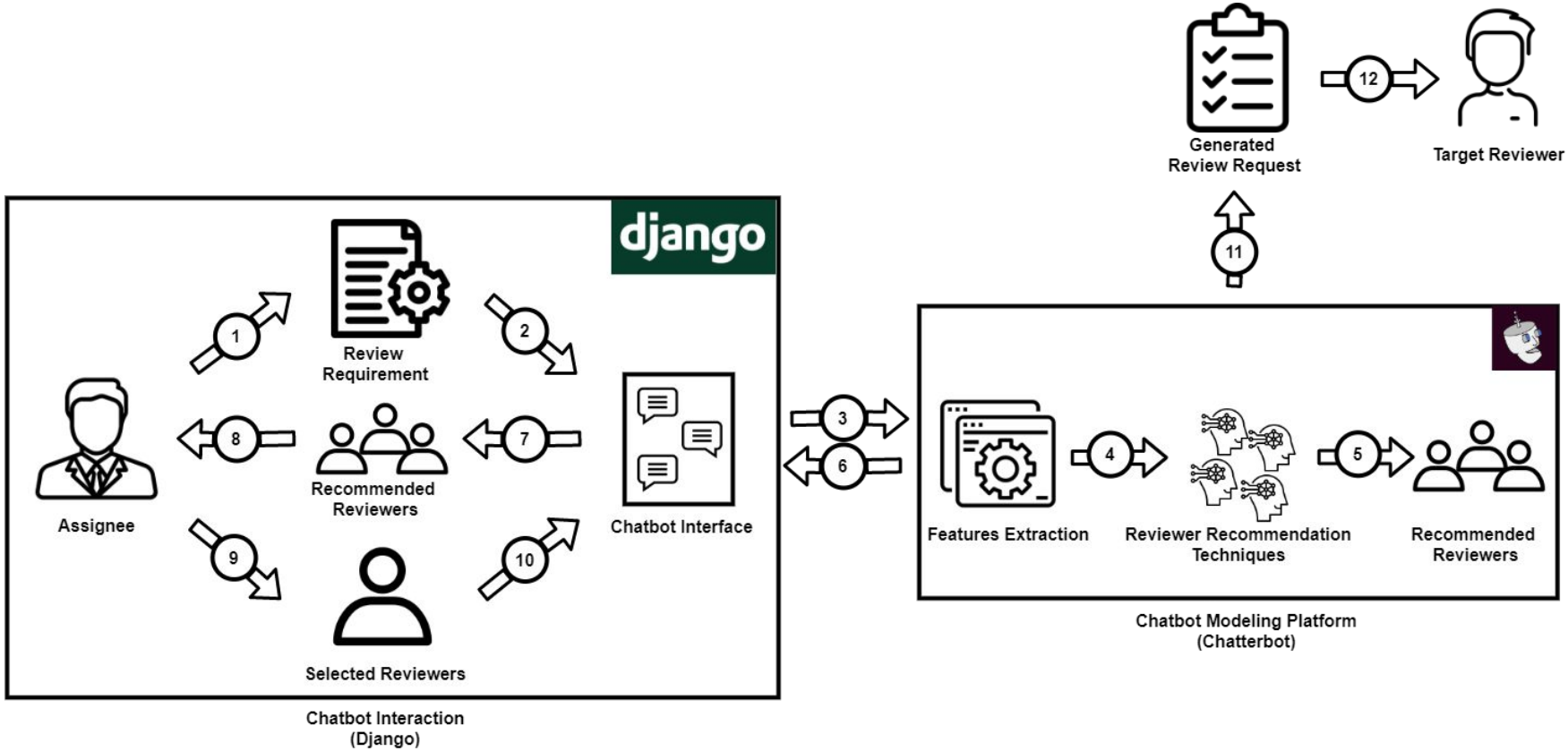
Hybrid Approach



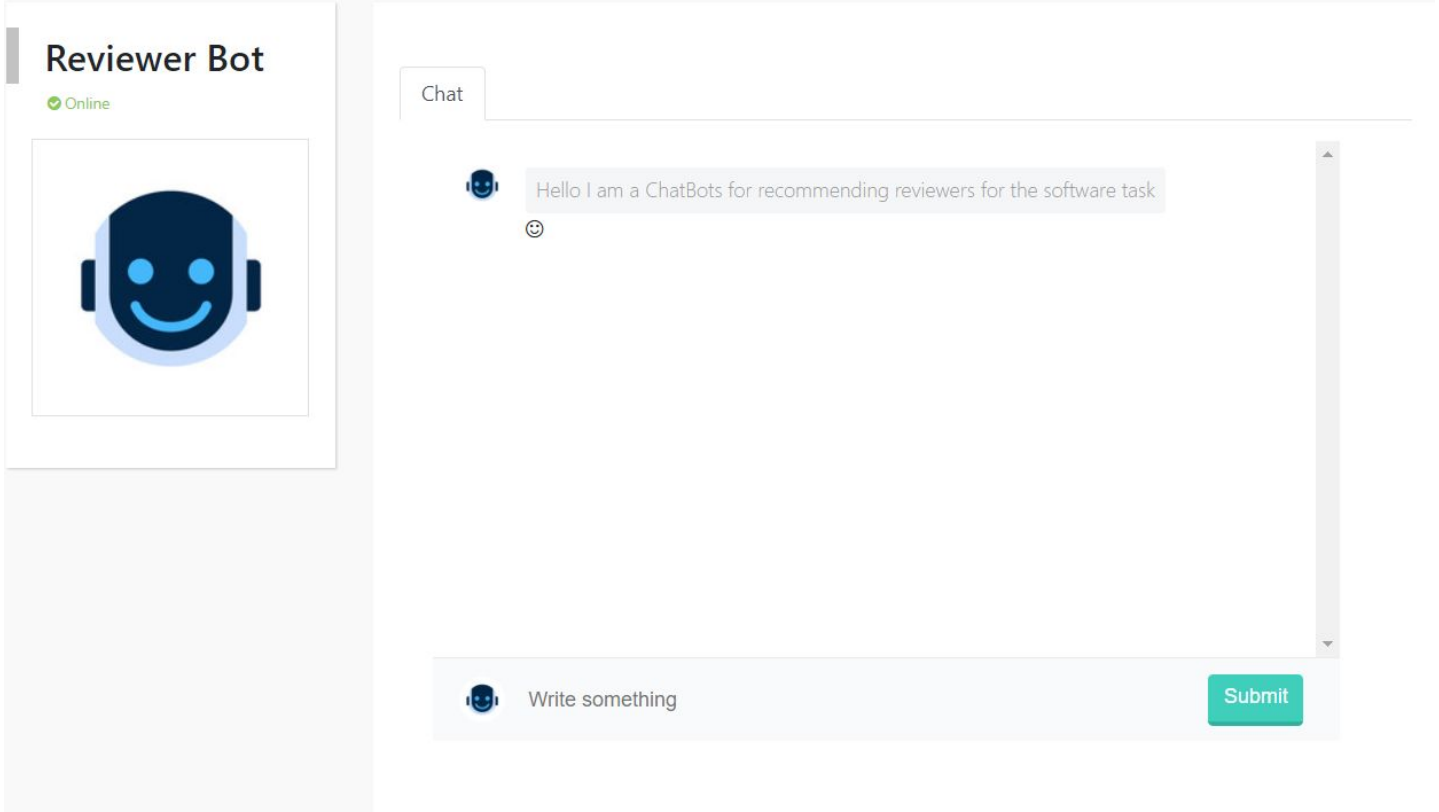
TF-IDF, filelocation, expertise, and SVM (Yang et al., 2018)

File location based and text mining model (Xia et al., 2015)

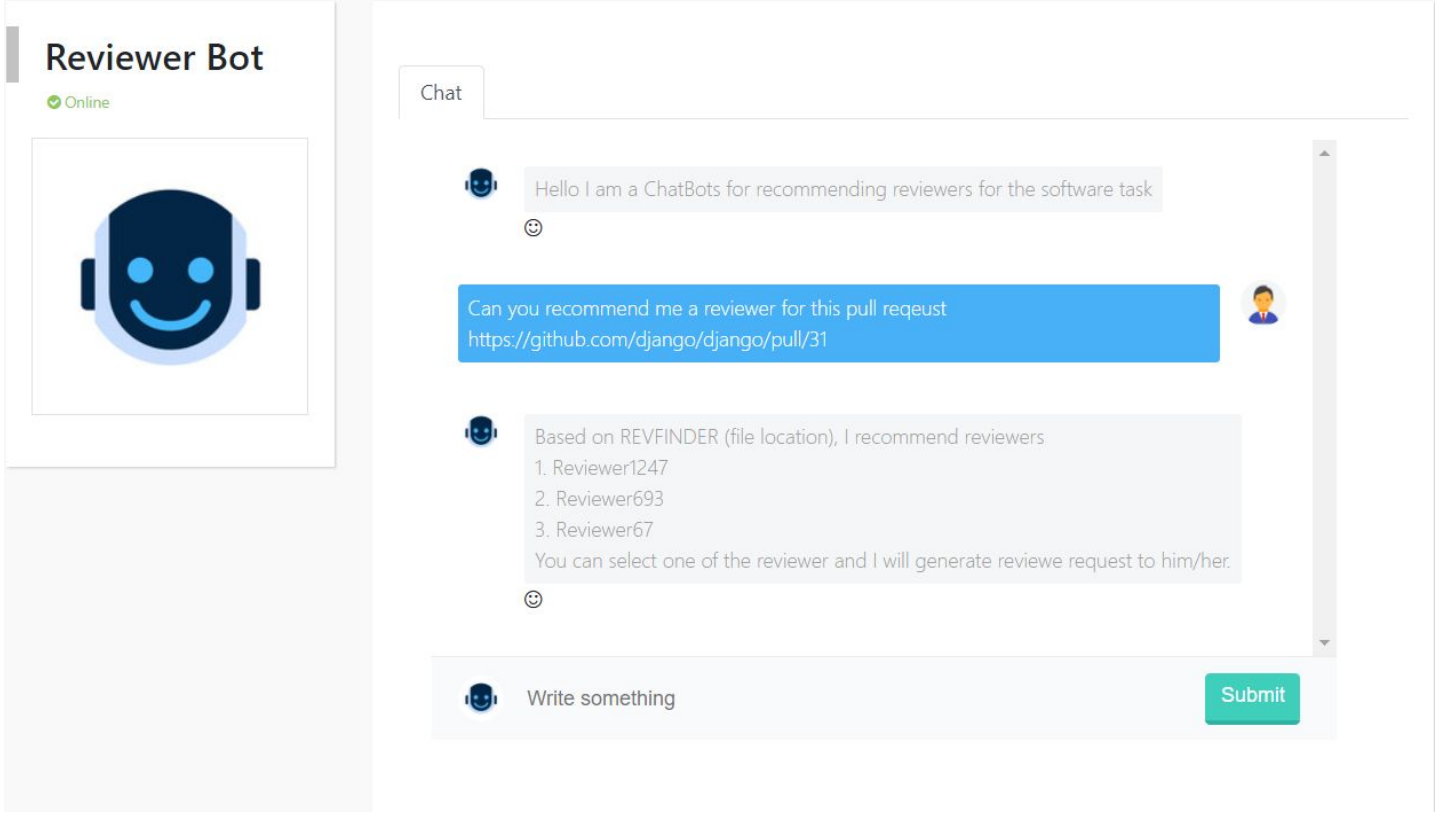
Our Approach



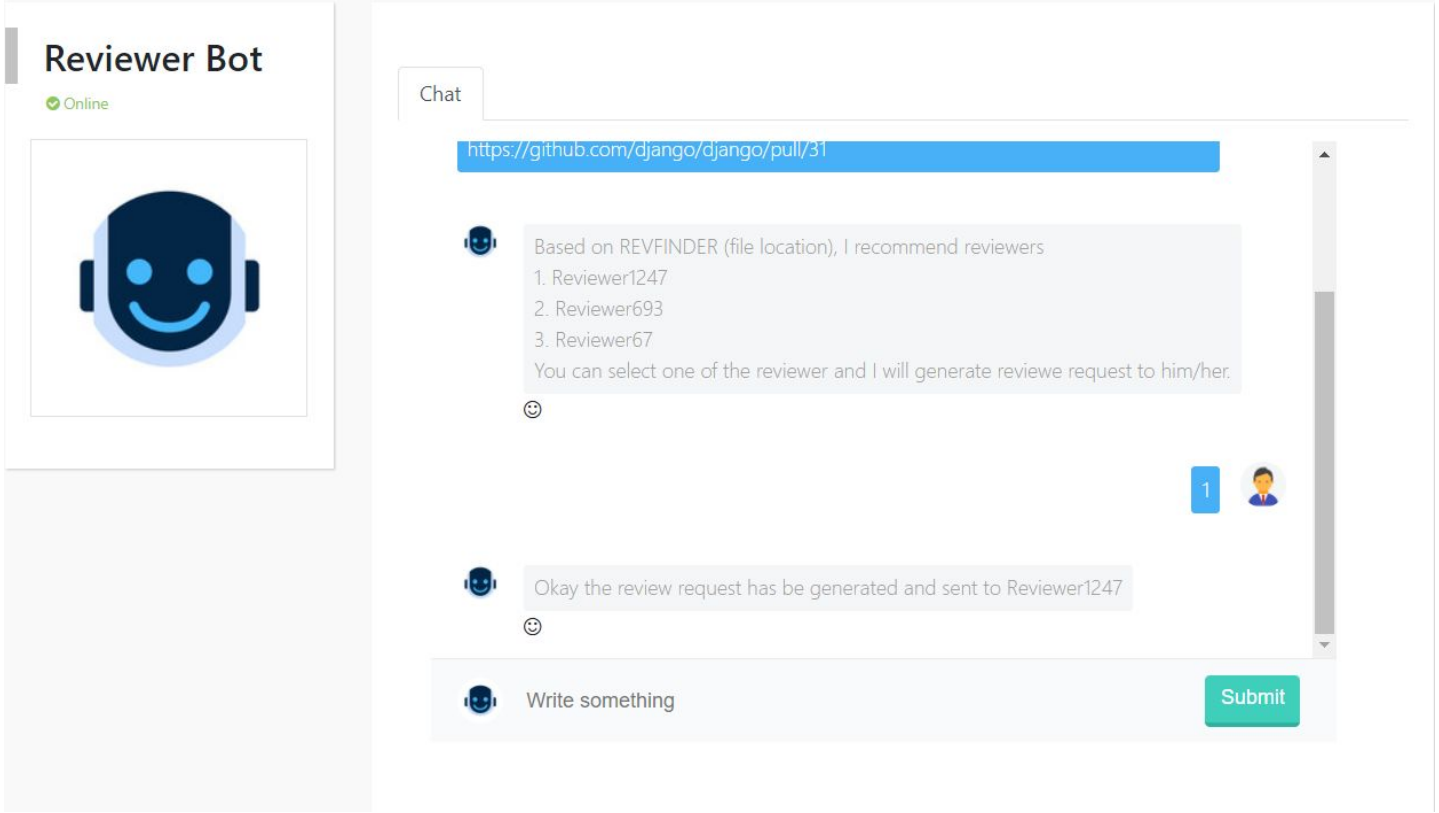
Our Approach (cont.)



Our Approach (cont.)



Our Approach (cont.)



Next Step of ChatBots

- Evaluation of the ChatBot
- Implementation of each reviewer recommendation algorithm
- Efficient conversational context to infer code reviewer features
- Extensions of the ChatBot