Tommy Hu
t.hu-3@student.tudelft.nl
Supervisor: Shreyan Biswas
Responsible professor: Ujwal Gadiraju

LEVERAGING LARGE LANGUAGE MODELS IN GAMES WITH A PURPOSE FOR KNOWLEDGE ELICITATION

TUDelft

1. Background

- Commonsense knowledge is needed to truly understand human behavior, which makes it crucial to the field of articifial intelligence [1]
- Knowledge elicitation aims to extract knowledge from humans and transform it into a machine-readable format
- Games with a purpose (GWAP) can be used for knowledge elicitation by recording and analyzing the actions of the humans playing the game.
- Large language models (LLM) have achieved strong performance on natural language tasks and could be used for enhanced knowledge elicitation in GWAPs.

2. Research Questions

- What type of games can be utilized for knowledge elicitation
- How have LLMs been used to play games and how well did they perform
- How can we utilize LLMs to generate game content that facilitates knowledge elicitation

3. Methodology

- A literature survey was conducted using papers from Scopus, Google Scholar, and the references of other papers.
- Papers from Scopus were found by searching for specific words in the title, abstract, and keywords
- Papers were chosen by judging the relevance of their title and abstract

4. Findings

- Some previous GWAPs for knowledge elicitation include: Verbosity, Common Consensus, the 20 Questions game, and FindItOut
- The generation of sentences followed by the response of the player forms the core of the knowledge elicitation process using GWAPs
- LLMs have demonstrated great performances playing games that could be used for knowledge elicitation
- LLMs could also be integrated into more complex games such as role-playing games, which could attract a larger amount of players
- LLMs have been used to generate game content in frameworks like SceneCraft, which can write a story and automatically integrate it into a game based on some simple inputs from an author
- Another way LLMs have been used to generate game content is in the generation of levels for a puzzle game, Sokoban. These results showed that LLMs were capable of generating content containing specific characteristics.

5. Discussion

- This research explores the possibilities of utilizing LLMs to play games, which could improve the accessibility of GWAPs that require multiple humans
- Increasing the accessibility of GWAPs can allow for more people to play the game, which results in more knowledge being elicited
- This research also shows the capabilities of LLMs in generating game content, which could speed up the development process of GWAPs
- The controllability of the generated content can allow for the elicitation of knowledge regarding specific subjects

6. Future work

- One issue that has been identified in this research is the usefulness of knowledge elicited from LLMs playing games
- Another area for future research is incorporating knowledge elicitation in other genres of games to attract more players

[1] Ernest Davis and Gary Marcus. Commonsense reasoning and commonsense knowledge in artificial intelligence, 9 2015.