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# An Analysis of Generative AI in Computing Education

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# An Analysis of Generative AI in Computing Education

*TREO Talk Paper*

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## Abstract

Since the origin of AI, the most talked about application of AI is how can computers understand and process information like humans. Generative AI is one type of such application, which involves generating novel content in the form of text, audio, images, or videos, learning from extensive data fed to the models. As an AI chatbot developed by the technology company OpenAI, ChatGPT is considered a generative AI using large language models and has been the most famous AI application around the world (Stringer & Wiggers, 2023). ChatGPT is trained on large amounts of textual data, and based on the prompt provided by users, it performs various kinds of text generation tasks that appear like to be human written. These text generation tasks typically are descriptive, question answer, and text completion. After signing up, everyone can freely access ChatGPT through its website (<https://chat.openai.com/auth/login>). Its impressive intelligence has created a lot of buzz not only in the software industry but also in the education since it released in November 2022 (Stringer & Wiggers, 2023; Thorp, 2023). Scholars have expressed diverse opinions on its impact on education and the veracity of the data it generates (Rospigliosi, 2023).

This study focuses on identifying the effectiveness of ChatGPT in computing education and how it can be used to support the potential user (Rospigliosi, 2023), typically a student/professor. The study aims to address three research questions: (1) How to rate the descriptive responses using Likert scale? (2) How crafting prompts makes a difference in the given response by ChatGPT? and (3) How to measure the performance: accuracy and completeness of the responses generated by the tool in computing education? To answer the research questions, a series of sample questions used in teaching an undergraduate course (Computer Organization) and a graduate course (Database Management Systems) are applied to test ChatGPT. Those sample questions fed to ChatGPT cover topics from theoretical concepts to program coding, and from introductory level to advanced level. The ChatGPT responses to the original sample questions and follow-up questions are recorded as the foundation of the following analysis. We will explore the efficacy of the responses from ChatGPT, analyze the difference in responses, and create metrics to measure the performance of the tool in the context of computing education.

## References

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