GPT Pedagogy

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Abstract

GPT-3 is a Large Language Model which, through overuse, is often used to deprive students of the opportunity to learn effectively. Our intended use case of GPT enables the transparent use of the technology between instructor and student. We aim to create a more active and participatory learning environment through the usage of the model in active learning. Our long-term goal for higher education is along the lines of the fourth UN SDG:

> Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

We view GPT as a way to create an adaptive learning experience which promotes the educational endeavor rather than detracts from it.

Our plan is to develop a GPT-3 based learning assistant for the *Introduction to Biology* course here at RPI. Through a partnership with the professor, we will gather sufficient amounts of course material to fine-tune a pre-trained GPT-3 model. This will create a knowledgeable and focused learning assistant. By creating this personalized AI tutor we can make it easier and more transparent for students to learn the material and reduce their stress.

One of our goals is for the model to maintain its conversational abilities while adding novel knowledge about whatever subject the learning assistant targets. This model will be able to generate a series of topic-relevant questions, evaluate the answers of those questions, and give useful feedback or counter-examples to the student. This model will also be able to store chats over time and learn from both them and reinforcement from faculty.

We also aim for this model to be generalizable to other classes and disciplines in the future. The model will work especially well for courses where it is difficult to give personalized feedback to each learner in each class meeting time, such as in classes that have a high student to faculty ratio. It will also work well for courses with students interested in AI who cannot adequately engage with that interest through the course material.