MONASH
ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2024-2025

Project Title: Developing an AI expert to support student learning in chemical engineering

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Objective

To develop an AI chatbot that is trained on general and Monash-specific data and can act as a learning assistant for students in Chemical Engineering.

Project Details

A preliminary version of the chatbot has already been developed by one of our educational designers. It is based on GPT4 and has been trained using public data as well as some specific information related to heat exchangers. We have attempted to alter its persona and the way it interacts with the user in order to better mimic a real conversation and to make sure that the chatbot enables student learning, rather than just giving all the information it has, or divulging the answer straight away. Instead, the idea is to have the chatbot prompt and probe the user to help them reach the right answer themselves, similar to the way in which human educators try to lead learners to the right answer, rather than providing it verbatim. In the SRP iteration of the chatbot, we plan to take a more targeted approach. The new version will be a John-bot: a bot that is trained to have the knowledge and persona of our colleague, John Westover. John has decades of industrial experience, which he uses to deliver the hardware aspects of our process control unit in Y3 chemical engineering. We want to see if we can capture that expertise, supplement it with publicly available data on the process control sensors and hardware that we use in our unit, and have John and his knowledge essentially available to students on demand. We will attempt to train the bot with John's knowledge and also John's style of answering a question with another question!

Prerequisites

No direct prerequisites, but experience in AI, ML, APIs, programming, and/or chemical engineering would be advantageous.