Chatbots Attempt Physics Homework—ChatGPT: Chat Generative Pre-Trained Transformer ⊘

Dan MacIsaac

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Dan MacIsaac, Column Editor, Physics Department
SUNY Buffalo State University, Buffalo, NY 14222; macisadl@buffalostate.edu

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• *Chatbots Attempt Physics Homework—ChatGPT: Chat Generative Pre-Trained Transformer*

https://www.openai.com
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https://arstechnica.com/information-technology/2023/02/ai-powered-bing-chat-loses-its-mind-when-fed-ars-technica-article/
https://www.washingtonpost.com/technology/2023/02/16/microsoft-bing-ai-chatbot-sydney/

According to my graduate student physics teachers and many faculty colleagues, the "red-hot topic" for physics instructors is now ChatGPT, an AI program that readily generates reams of text—essays, computer code, and even homework solutions of dubious quality and accuracy. Artificial intelligence seems far more artificial than intelligent here; ChatGPT is substituting statistical correlation for conceptual understanding.

Rhett Allain has recorded multiple amusingly insightful (and ultimately unsuccessful) interactions with ChatGPT trying to help it figure out Chegg (an online homework service) physics homework problems in "Will ChatGPT replace Chegg for Physics Solutions?" Next, in "Can ChatGPT Be Your Physics Tutor?" Rhett tries a more general attempt to have ChatGPT derive and then solve and explain examples using the kinematic equations (ChatGPT explanations have some stunningly bad interpretations). Then, with mixed success, he tries using the chatbot to generate physics questions in "Can ChatGPT make physics HW problems?" Finally, in "Physics Solution: ChatGPT vs. Chegg vs. Me," a three-way ChatGPT/Chegg/Rhett comparison attempts a classic homework *E* field homework problem (the chatbot fails).

Rhett has two more general discursive pieces—a 50-min interview in the "Lab Out Loud" podcast and a medium article. An alternative opinion on ChatGPT from Prof. Moriarty of the Sixty Symbols channel at the University of Nottingham doing physics problems (standard and AP-level HS physics, then university quantum mechanics) is seen in "ChatGPT does Physics – Sixty Symbols." Also, OmniCalculator presents a cute succinct example of ChatGPT throwing text and correlation at the wall in an unsuccessful attempt at a simple driving time problem.

Finally, two articles from *Ars Technica* and the *Washington Post* discuss highly disturbing off-the-rails non-physics chatbot behavior. Think "autocompletion on steroids" with no moral compass, generating text that appears plausibly written by humans. Recent amusing attempts include tech reporters baiting Bing Chat (Microsoft's version of ChatGPT) into threatening the reporter or lying about something factual and then doubling down on the lie, which is way too human behavior for my preferred search engine, thanks very much.

Quick takeaway from *WebSights*: Ask your students to explain their work. Use multiple representations like images and require data interpretation. Use ChatGPT to generate bad examples that you then have your students critique and fix. Don't write trivial, crappy homework and test questions. Rest easy—we are still pretty safe from Skynet in the physics class, though you should always view your search engine responses with suspicion.

• *(University) Physics in a Nutshell by Tobias Wegener*

https://Physics-in-a-nutshell.com
https://physicsclassroom.com

A "structured self-study" education resource for learning university-level physics, reminiscent of the Physics Classroom HS-level site. Very sparse, well-thought-out writing with lots of illustrations, animations, and visualization, together with undergraduate-level math, as created and maintained by a professional web graphic designer, with intentional layout for mobile devices. I particularly enjoyed his calculus-based treatment of Earth's radiation energy balance and radiative forcing, which led me to his site.

• *Energy and Equity Portal: Integrating Energy, Equity, and Place in High School Physics*

https://Energyandequity.org
https://tinyurl.com/WS-Sociopolitical
https://kellyoshea.blog/2022/07/07/energy-story-mini-project/

This new AAPT/Compadre-hosted and NSF-funded portal supports a community of people interested in teaching energy physics situated in sociocultural realities, economic issues, and public policies. The portal hosts materials, lessons, and tools and seems targeted to students from middle school through university. I particularly enjoyed the very refreshing and prototypical *Energy is Sociopolitical* video by Rachel Scherr and associated lessons and community activities. Kelly O'Shea discusses a nice implementation of these materials on her blog. I hope to see more physics courses like this in the future, as they are insightful, relevant, and of societal import.

18 July 2024 12:55:34