

CAREER READINESS ONLINE CHALLENGE
2022-2023

OPEN AI

The start to a new technologically forward future.



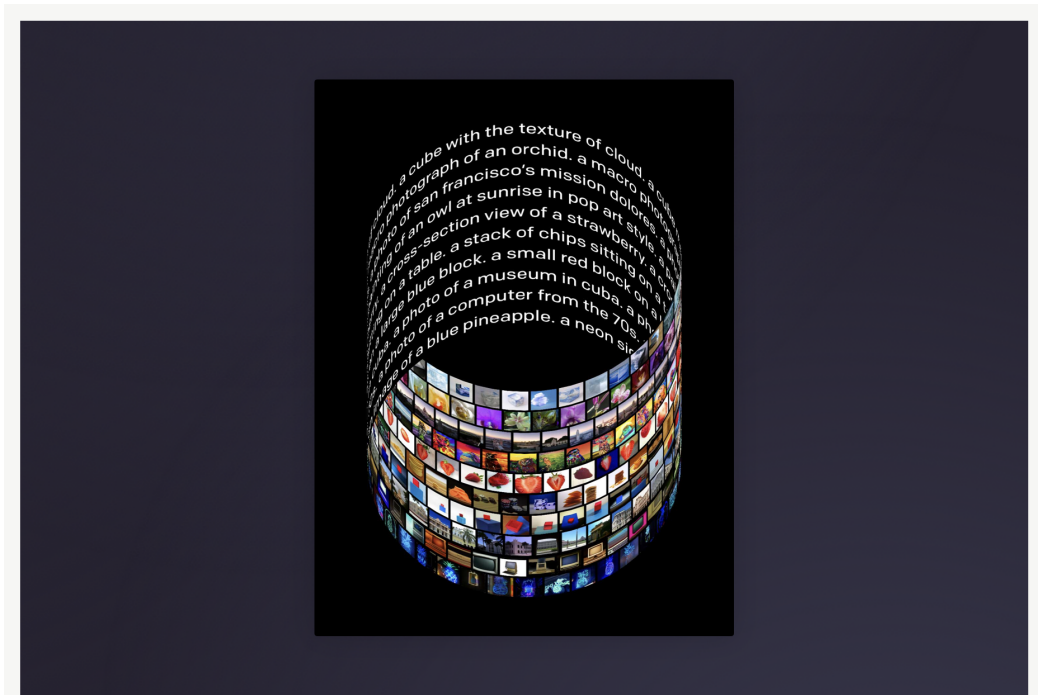
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INTRODUCTION:

This document is exploring the similarities and differences in engineering design processes, comparing VEX Robotics with possible STEM careers. Our team will look into OpenAI, contrasting the design process with the one we used while creating our robot.



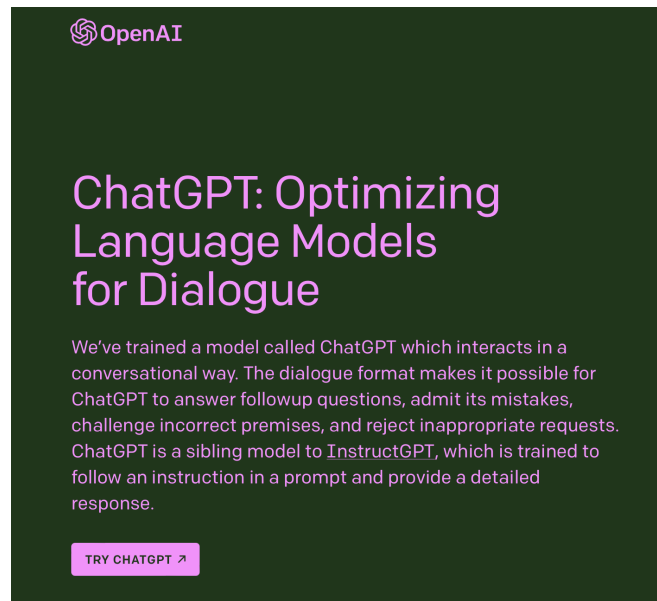
DALL·E: Creating Images from Text
January 5, 2021

An image of OpenAI's milestone, where the technology has allowed it to generate images from text.

WHY OPEN AI:

OpenAI stood out to me, unlike most STEM-related careers. Not only is it “capped-profit,” meaning money is not the priority, but it was also a space where brilliant minds and innovators could work together to shape the future of technology and propel humanity forward. Also, while looking at past Career Readiness projects, I saw the same notorious names through and through: Apple, Tesla, SpaceX, etc. I wanted to choose a career that genuinely changed today’s world, and had not been chosen thus far.

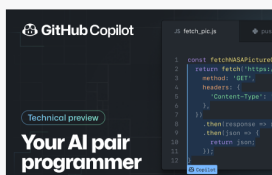
Furthermore, OpenAI was not limited to one innovation. Its API is displayed practically everywhere. Plus, there is software that helps our technology develop further. OpenAI Gym is a toolkit to help researchers arrive at conclusive decisions and increase AI in the territory of conclusions. There is Universe, a platform to help train AI's general intelligence. Many technological developments were created there, and the most prominent of all would be ChatGPT, an AI that can generate smooth, human-like text.



A description of ChatGPT from the OpenAI website.

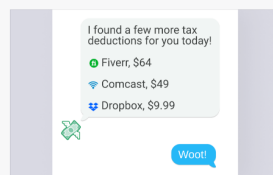
Built with OpenAI's API

Our API has been deployed in thousands of applications with tasks ranging from helping people learn new languages to solving complex classification problems.



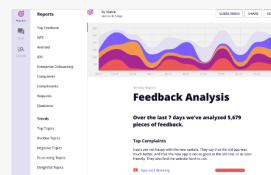
GitHub Copilot

AI pair programmer that helps you write code faster with less work. Using Codex, GitHub Copilot applies the context in your editor and synthesizes whole lines and even entire functions of code.



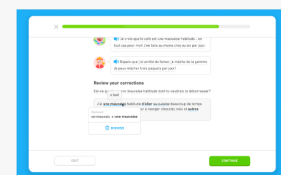
Keeper Tax

Helps freelancers automatically find tax-deductible expenses by using GPT-3 to interpret data from their bank statements into usable transaction information.



Viable

Helps businesses better and more quickly understand what customers are telling them by using language models, including GPT-3, to analyze customer feedback and generate summaries and insights.



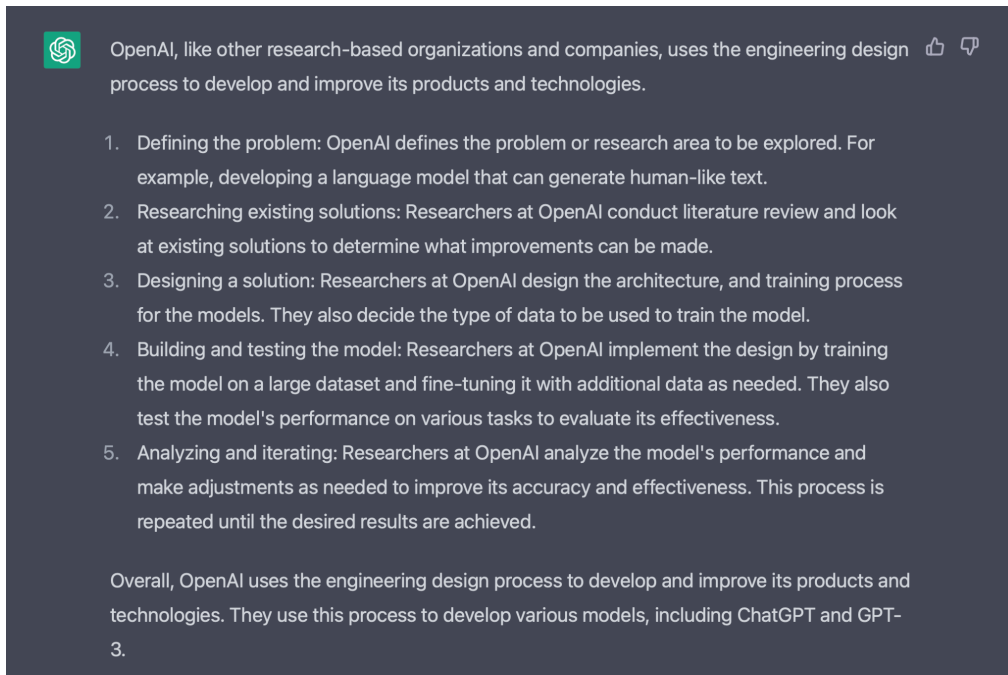
Duolingo

Uses GPT-3 to provide French grammar corrections. An internal Duolingo study shows that use of this feature leads to measurably better second language writing skills!

Just some applications where OpenAI's API was involved.

OpenAI's Design Process:

Stated by OpenAI's software, ChatGPT itself:

A screenshot of a ChatGPT chat window with a dark background. At the top, the OpenAI logo is on the left, and the text "OpenAI, like other research-based organizations and companies, uses the engineering design process to develop and improve its products and technologies." is on the right, followed by thumbs up and down icons. Below this is a numbered list of five steps: 1. Defining the problem, 2. Researching existing solutions, 3. Designing a solution, 4. Building and testing the model, and 5. Analyzing and iterating. At the bottom, a paragraph states that OpenAI uses this process for various models, including ChatGPT and GPT-3.

OpenAI, like other research-based organizations and companies, uses the engineering design process to develop and improve its products and technologies.

1. Defining the problem: OpenAI defines the problem or research area to be explored. For example, developing a language model that can generate human-like text.
2. Researching existing solutions: Researchers at OpenAI conduct literature review and look at existing solutions to determine what improvements can be made.
3. Designing a solution: Researchers at OpenAI design the architecture, and training process for the models. They also decide the type of data to be used to train the model.
4. Building and testing the model: Researchers at OpenAI implement the design by training the model on a large dataset and fine-tuning it with additional data as needed. They also test the model's performance on various tasks to evaluate its effectiveness.
5. Analyzing and iterating: Researchers at OpenAI analyze the model's performance and make adjustments as needed to improve its accuracy and effectiveness. This process is repeated until the desired results are achieved.

Overall, OpenAI uses the engineering design process to develop and improve its products and technologies. They use this process to develop various models, including ChatGPT and GPT-3.

Stated by ChatGPT, this is OpenAI's use of the engineering design process, and the use of it.

OpenAI's Engineering Design Process:

1. Defining the problem
 - Addressing the problem, focusing on the big ideas
2. Researching existing solutions
 - Looking back on the past and seeing what improvements can be made
3. Designing a solution
 - Designing the architecture
4. Building and testing
 - Prototyping as well as testing their idea with fine-tuning when necessary
5. Analyzing and iterating
 - Evaluating the performance and adjusting to improve the model. This would be repeated until the model is ideal.

Our Team's Engineering Design Process:

1. Making a plan

- We would have a basic idea of what we wanted to accomplish. For example, we knew after seeing this year's structures that we would need to be able to shoot out the disks without jamming and with enough force

2. Brainstorm

- Based on past experiences and mentors' guidance, we asked ourselves how we could find the solution.

3. Prototype

- Our team would then create a first draft of what we wanted to accomplish. Sometimes that would be via CAD, other times with sketching or going for it and building.

4. Testing and analyzing

- We made sure to test this prototype, seeing what we could potentially change to make it even better.

5. Iterating

- Whatever we created as a first draft was almost always far from perfect. From then, we would continuously change and amend our design to best fit our interests. If not, we would altogether scrap it and start from scratch.

A Comparison of Vex Robotics and OpenAI's Design Processes:

Similarities:

Researching—Both our team and OpenAI would draw information. Then, we would look into the past, see what could be drawn, and use that data to develop a prototype.

Prototype—First drafts were always created to test the idea and see what improvements were made. This was seen in our team, as well as with OpenAI.

Making Adjustments—This was in common with both teams, as our team and OpenAI fine-tuned our creations with every step.

Differences:

The Beginning—While OpenAI sought to solve a problem, our team let our creative juices flow. This meant we would shout out ideas and see where they would take us. We focused more on our thoughts and ideas rather than big ideas and what significant issues would come up.

Brainstorming—Unlike OpenAI, we did not research past ideas and instead used our brains to develop unique ideas. This would ensure that innovation and creativity are seen in our design.

The Final Steps: OpenAI would continuously add to their creation, perfecting it along the way. Our team, however, our design process was utterly iterative. This meant that we could go back and scrap everything we had done and start from the beginning multiple times.

VEX Robotics and a future career:

I came into this program thinking it would be a fun project involving making robots and having fun. Instead, this experience will benefit me in my future career. We were successful with the guidance of a process and the reliability of a structure to fall back on. We could make mistakes, learn, and start completely from the beginning without panicking or hesitating when needed.

Conclusion:

OpenAI and its design process helped me understand the importance of VEX and how it is preparing me for my future career. The insight I have received and the intricacies regarding the process helped me realize that despite how complicated something may seem, anything is possible with a solid foundation. There are thousands of careers that, in simplicity, use the engineering design process. I am thankful for this opportunity to experience something that will be a guide in whatever future career I plan to pursue. I have been exposed to engineering and innovation, and involvement in VEX has helped me realize the skills I can develop and transfer to STEM-related fields.

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