6-1 JOURNAL

6-1 Journal: Emerging Technology and Artifact Update

CS-499-12473-M01 Computer Science Capstone 2024 C-5 (Sept-Oct)

Michael Zietz

Southern New Hampshire University

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* What is the identification and description of each technology?

OpenAI is an API resource that, when implemented as a library in a code base, allows for artificial intelligence prompt submission using popular and diverse large-language models. Once a model has been purchased, the respective AI APIs are available as libraries for several languages including: Python, Node.js, .NET, Azure, and other community libraries like C++, Java, Go, and even Kotlin. (OpenAI Platform, 2024) Once imported, a local instance of OpenAI() must be initialized, a model can be selected, and roles for the system and user can be laid out. The system acts as how helpful the AI generation will be and the user prompt is the actual prompt to be generated. (OpenAI Platform, 2024) This resource allows for developers to create their own programs that utilize the generative capabilities of large-language models such as ChatGPT.

Slant3D’s 3D Printing API allows for created applications with built-in access to their 3D printing farm services. Once the resource is implemented in a code base, any program can submit orders to produce 3D printed models. (Slant 3D Printing API, 2016) This API is advertised for app and website integration which then establishes the connection to Slant3D’s printing capabilities. One of their advertised examples is a website that creates an electronic night light possessing the user’s custom image. (Slant 3D Printing API, 2016) Unfortunately, Slant3D’s models have to be purchased to understand how they work on a technical level.

* What are the likely impacts on computer science or your career?

OpenAI’s availability means that software development companies do not have to invest resources in creating, developing, and maintaining their own AI models for chat and image generation from prompts. This proprietary resource can allow for more uses of AI in upcoming products and allow its these capabilities in areas where otherwise impossible. Large-language models, like Chat GPT, require more data and engineering than what is feasible for most development companies, so this resource can totally change how the computer science field is able to produce modern products with buzzword capabilities like AI.

The 3Dprinting API owned and distributed by Slant3D, and other companies’ proprietary software like it, allows development teams to create and publish applications or services while not physically needing to possess the 3D printing capabilities in house. A personal example of this that I’ve used in the past is Hero Forge Custom Miniatures. (Hero Forge Custom Miniatures, 2024) This is a web-based platform that allows the user to create and customize a 3D model for the purposes of tabletop games. With an API like this, Hero Forge could submit each customer’s designs to Slant3D for printing within their website and allow them to outsource 3D printing. That way, the company could focus resources on creating more software that takes advantage of the API rather than managing the 3D printing facilities.

* How might the two technologies impact humans, communities, or the world?

OpenAi’s implications on humans, communities, and the world are rather simple. Simply put, more resources for AI means more interaction with AI on all levels. Users are exposed to AI tools in a larger variety of ways that can be introduced in unique circumstances. The more users interact with these AI tools, the more data OpenAI will have to then create more accurate responses. Because of the legally grey area surrounding artificial intelligence and generative models, there are some massive and possibly dangerous implications to AI’s advancements and widespread accessibility. Job security, spread of misinformation, and reduction in education are all controversial topics surrounding AI currently. (Graefen & Fazal, 2024) The following quote from a study on AI’s use and education sums this topic up nicely:

“… Chat GPT has the potential to revolutionize the way we teach and learn. Its ability to generate human-like responses and adapt to the user's language and style of communication makes it an effective tool for personalized learning. On the other hand, there are also concerns about the use of Chat GPT in education. Critics contend that it might not be as successful at teaching critical thinking and problem-solving techniques and that it might result in a decline in human connection and individualized learning. According to our research, Chat GPT has certain drawbacks and difficulties even though it has the potential to be an effective teaching tool. Therefore, it is important that educators and policymakers carefully consider the potential advantages and disadvantages of using Chat GPT in their classrooms and develop appropriate strategies for responsible use.” (Graefen & Fazal, 2024)

3D printing, as a whole, has massively impacted humans on all levels. The ability to design and produce a physical object using cheap and easily accessible materials has vastly enhanced manufacturing and producing products that would otherwise take more resources to create casting molds. 3D printing farms are another source that improve upon this concept by taking the expensive and space intensive process of procuring many 3D printers where their services can be purchased on a needed basis. Lastly, this API can allow for end users to then interact with these printing services, so any customer can participate in custom designed and created products unique to their needs. Before and API like this, individuals would either need to have to the skills required to create these models, which takes time to learn and master, or have resources and connections to pay a craftsperson to do it for them. This new technology vastly shortens the timeframe and allows for more accessibility than previously possible.

* Which course outcomes have you achieved so far, and which ones remain?

In my artifact’s current state, post enhancements, I have achieved the following course outcomes successfully:

* Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.
* Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.
* Design and evaluate computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution while managing the trade-offs involved in design choices.
* Develop a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources.

The enhancements I have left to incorporate into my artifacts are as follows:

* Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry-specific goals.

Resources

Graefen, B., & Fazal, N. (2024). From Chat bots to Virtual Tutors: An Overview of Chat GPT’s

Role in the Future of Education. Archives of Pharmacy Practice, 15(2), 43–52.

https://doi.org/10.51847/TOuppjEDSX

*Hero Forge Custom Miniatures*. (2024). Heroforge.com; Hero Forge. https://www.heroforge.com/?srsltid=AfmBOoq6QoGEwutGrataDUaLDqJg7CjrbOEkw30zhONWMynQ7wffB9U5

*OpenAI Platform*. (2024). Openai.com. https://platform.openai.com/docs/guides/text-

generation/quickstart‌

*Slant 3D Printing API*. (2016). Slant 3D. https://www.slant3d.com/slant-3d-printing-api

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This week did not go as planned. I was struck by a pretty severe brand of Covid and ended up spending most of this week in bed resting. Because of this delay, I was not able to make as much progress on this project as I would have like since enhancement one still needs to be wrapped up. I will not let this unexpected delay prevent me from submitting the final version of this project next week. I will reach out via email should questions arise. Thank you.

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| **Checkpoint** | **Software Design**  **and Engineering** | **Algorithms and Data Structures** | **Databases** |
| **Name of Artifact Used** | Relentless Heroes | Travlr Getaways | Grazioso Salvare Animal Rescue |
| **Status of Initial Enhancement** | Submitted | Submitted | Submitted |
| **Submission Status** | Near Completion | Submitted | Submitted |
| **Status of Final Enhancement** | Near Completion | Submitted | Submitted |
| **Uploaded to ePortfolio** | Not completed | Submitted | Submitted |
| **Status of Finalized ePortfolio** | Not completed | Not completed | Not completed |