**Recent Advances in Artificial Intelligence**

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As humans strive for innovation, it is only natural that we invent tools of excellence and reach new heights to achieve the seemingly impossible. Such is demonstrated by the many recent advances in Artificial Intelligence (AI) that range from Machine Learning (ML), deep learning, autonomous vehicles, and language models. The most fascinating application of AI so far with these would have to be language models, especially the likes of Generative Pre-trained Transformer (GPT)/ChatGPT recently. A language model can be defined as a “type of machine learning trained to conduct a probability distribution over words.” (Language Models, Explained: How GPT and Other Models Work, 2023) Through a given context, it will appropriately fill a blank in a phrase or sentence via a prediction model. Thanks to this type of model, it is now “possible for computers to write sentences, essays, and maybe even novels” (Artificial Intelligence - Assignment 1: Recent Advances in AI Essay, 2019) as part of our daily lives.

To greater understand what language models are and can accomplish, the first step is to take a look into its humble beginnings. According to Introduction to Large Language Models (2022), the history of large language models can be traced back starting in the 1950s, when AI as a field was first established. Just a few years later into the next decade in the 1960s, according to Ireland (2012), a computer program named ELIZA was developed by Joseph Weizenbaum at the MIT Artificial Intelligence Laboratory. Put simply, the idea was that it simulates an intimate conversation of how a therapist may respond. As Introduction to Large Language Models (2022) suggests, this would go further as after a result of the 1990s’ dawn of deep learning and the key innovation of unsupervised learning that “allowed researchers to train models on massive amounts of data, leading to the development of large language models that could generate human-like text.” (Introduction to Large Language Models, 2022).

In recent times, one of the most popular language models is GPT. Exploding in popularity in the last few months, it captivated many via OpenAI, established in 2015, and its chatbot implementation of the advanced language model, called ChatGPT. According to Lund et al. (2023), GPT is a language model that understands human inputs and then produces response text that is nearly indistinguishable from human language. Through generative, unsupervised pretraining, it is able to fill in knowledge gaps as it explores and learn naturally as the training data is unlabeled. Easily, the implication is that society will be able to work with the AI to generate content on a massive scale. Therefore, the potential this technology has for any industry from this point forward is vast and unpredictable.

There are already many applications for this and the related Natural Language Processing (NLP) area. According to Mani (2020), AI-powered digital assistants within organizations have gained considerable popularity in recent years. Some names to be familiar with are Amazon Alexa, Apple Siri, Google Assistant, and Microsoft Cortana. At the core, these are simply responsive software programs that use specific hardware like an Internet-connected smart speaker, phone, laptop, and other wearable gadgets. Requests or directions given from the user become tasks for them to gather information and fulfill. “Earlier software programs used rules-based automation to perform tasks for their users” (Mani, 2020) and today, these can work much differently. This next-generation of digital assistants are powered with three capabilities: Machine Learning, Voice recognition, and voice-enabled NLP.

Considering those components to get a digital assistant working, there is one main component that makes their responses feel friendly is likely changing many industries outside their normal intended use. Voice AI is “a conversational AI tool that uses voice commands to receive and interpret directives. With this technology, devices can interact and respond to human questions in natural language.” (Chotia, 2021). It starts by understanding the speech to text, filters out ambient sounds, transfers to neural processing, analyzes the text for deeper context, evaluates its response, and will communicate its response to the user in the preferred language while saving the response for future reference. A normal use for this could be where organizations already deploy these “voicebots” as part of their customer support strategy. According to Chotia (2021), it reduces the burden on the customer support staff and adds an extra layer of security through voice authentication, which is extremely useful for fraud prevention.

While having conversations with machines sounds interesting enough and is helping teams across the world, the processing of voice through AI has taken the creative and music industries by storm. This leads to an implication that creative collaboration may no longer require another person and vigilance on what is real or not generated by AI will require more effort. Out on different video and music platforms, there are new creations that involve using a famous celebrity or performer’s voice recreated through AI training and generation to be featured on an unknown artist’s song or create new covers of current songs. According to the article Fake Drake Raises Questions over AI Tools Used to Create Covers (2023), an AI-generated voice of famous Canadian rapper Drake was used to perform New York rapper’s Ice Spice’s song “Munch” and it gained so much notoriety that he called it out on his own Instagram social media profile. While it is most likely created all in fun, there could some serious implications for this type of technology to be misused to land the artists in trouble with their fanbase or media. That is but one example of ethical concern, yet it is actually involving all types of AI-generated work.

No one could foresee how AI-generated work can be misused, but it is imperative that this sets a precedent for government and new interest groups to mobilize and take thoughtful action on regulation. For the case of sound-alikes generated by AI, one form is the “Campaign for Human Artistry, which is trying to set guidelines for the use of creative AIs, and counts a number of large international music industry organizations as members.” (MusicAlly, 2023). While this organization may be going over the line by stopping people from training AI models on music without a license, it still is an important discussion to be had. Similarly, there could be voice professionals and businesses, such as Cameo, that will need to change their profession or business model as there will no longer be a need to pay the party to make an appearance on video if you can use a “deepfake” version of their likeness and use AI to train their voice to say what you need it to.

For better or worse, society has seemingly entered the Age of AI. The further implications, uses, and applications will be revealed in due time. Organizations already employ these tools in their customer support and other technical software, so it will not appear all at once but incrementally. Whether many innovations come from the use of generated content via tools like ChatGPT or AI-generated voices, it is important to keep up-to-date and find its most beneficial uses on an individual level.

References

Chotia, R. (2021, July 19). *Voice AI: What is it and How Does it Work?* Verloop.io. https://verloop.io/blog/how-voice-ai-works/

*Artificial Intelligence - Assignment 1: Recent Advances in AI Essay*. (2019, September 24). Retrieved from https://study.com/academy/lesson/artificial-intelligence-assignment-1-current-trends-in-ai.html.

*Fake Drake raises questions over AI tools used to create covers*. (2023, April 17). Music Ally. https://musically.com/2023/04/17/fake-drake-raises-questions-over-ai-tools-used-to-create-covers/

*Introduction to Large Language Models*. (2022, December 6). Omega Venture Partners. https://www.omegavp.com/articles/introduction-to-large-language-models/

Ireland, C. (2012, September 13). *Alan Turing at 100*. Harvard Gazette. https://news.harvard.edu/gazette/story/2012/09/alan-turing-at-100/

*Language Models, Explained: How GPT and Other Models Work*. (2023, January 18). AltexSoft. https://www.altexsoft.com/blog/language-models-gpt/

Lund, B., Ting, W., Mannuru, N. R., Nie, B., Shimray, S., & Wang, Z. (2023). ChatGPT and a New Academic Reality: AI-Written Research Papers and the Ethics of the Large Language Models in Scholarly Publishing. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4389887

Mani, S. (2020, November 4). *Artificial Intelligence powered voice assistants*. Medium. https://medium.com/voice-tech-podcast/artificial-intelligence-powered-digital-assistants-1e0bdf108641