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- 01** **Who Owns AI-Created Art?**
by Eunseo CHO
- 02** **Could Fake Data be Used to Combat Breaches?**
by Heeyoun RYU
- 03** **City Matrix Works to Improve Urban Decision Making**
by Santiago Augusto SILVA
- 04** **Status Quo and Transition of Work from Home Culture**
by Jiri HAVEL
- 05** **Are Metaverse Concerts the Future?**
by Sereimony SEK



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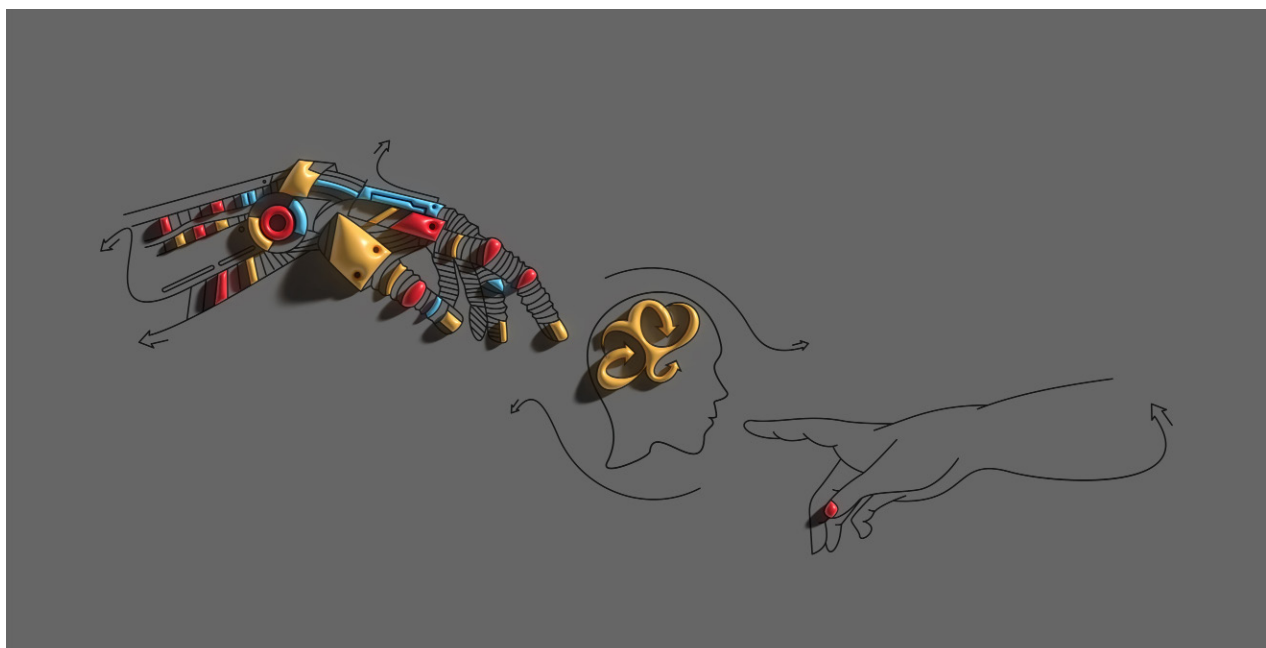
Who Owns AI-Created Art?

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The winning entry of an AI-generated piece of art for the Colorado State Fair Fine Arts Competition last August has alarmed about the rising copyright issues surrounding AI-generated images. Artist Jason Allen used the AI software Midjourney to create his submission ‘Theatre d’Opera Spatial’ and by winning the first prize, showed that AI’s ability to create art is no longer inferior to that of humans [1]. Our long-standing belief that mankind is better at creating has been challenged, and the legal conundrum of its copyrights has come to the fore.

For any AI piece at least three players contribute to creating the image – the software company, the creator who entered the text, and various artists who have created the original images that the AI referred to. For example, DALL-E 2 of OpenAI is an artificial neural network that analyzes various art pieces and their text captions and understands the linkage between the image and the text using a model called CLIP. Repeating this process numerous times creates art that matches the best with the user’s command text. However, it is impossible to figure out which artist DALL-E 2 referred to because it uses the diffusion model: it randomly selects pixels from various images and distorts them by creating noise, to then create a ‘brand new art.[2] Thus, even though the neural network learns from the various artist’s pieces, we cannot see it as



an imitation of pre-existing art. Is the creator the person who decided what to draw, or the developer who created the skill to draw it?

Last February, the US Copyright Office refused to grant copyright to the AI-generated art, mentioning that “the current copyright law requires human authorship for copyright protection.”[3] However, it is still controversial whether the text command itself is a part of human authorship. This legal issue leads to the fundamental question – to what extent is human effort and input required to be considered art? Current Korean patent law limits the scope of copyright to “a creation that expresses human thought of emotion.”[4] The Korean Copyright Commission, on the other hand, affirmed the possibility of legal action by other laws including the Unfair Competition Prevention Act (□□□□ □□□) in the case of commercial use [5]. For instance, if the person generates Mickey Mouse via an AI program, then Disney might be able to sue based on the Unfair Competition Prevention Act as long as the generated art is reasonably similar.

Recently, OpenAI announced that it will make public the API of DALL-E 2 to software developers so that this technology can benefit more people[6]. Current trends seem to deny the copyright of AI-generated artwork because of the issue of human authorship. Still, the dispute will continue as the commercial use of AI-generated work grows.

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Could Fake Data be Used to Combat Breaches?

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Recently, more than 500 million user records of Whatsapp were leaked by a hacker, leaving accounts at risk for phishing and identity theft [1]. Naturally, the harm isn't only done to the individuals— it applies to the companies that were hacked into as well. According to statistics from 2019, 60 percent of small companies shutdown within 6 months of suffering a data breach [2].

Fake data has been proposed by startup Tonic as a solution and a means to heighten data security [3]. This can especially be applied during the pre-production environment where developers leave large data footprints in the process of engaging with and modifying user information. Fake or synthetic data can be divided into different levels depending on how it is related to the real world. For example, made-up names and numbers that have no connection to the outside world would be a piece of low-level fake data, while data that has been modified using AI and complex neural networks so that it is realistic (in the sense that it reflects the real world) would pertain to a higher level [4]. Thus, this type of fake data can actually be used to test products. This way, when this realistic fake data has been leaked in the process of product development,

02. Could Fake Data be Used to Combat Breaches?

no harm could be done as successfully “de-identified data” which cannot be “re-identified” - effectively placing only the fake data at risk [4]. This technology that allows the creation of realistic data opens ways for developers to collect what they need to build their products more easily because they do not cause privacy breaches.

A similar idea has also been presented by Singapore startup BetterData during the startup competition held in South Korea on November 24th [5]. The company generates and provides artificial intelligence synthesis data by converting personal information into anonymous data. The data is tokenized and stored in a blockchain, accessible only with a personal encryption key. The converted information does not belong to an actual user and can be shared [5].

Sourcing realistic data while making sure all privacy issues are secured is a difficult task for developers. However, with the help of AI, the notion of fake data has been implemented to make that task easier and safer. Although limitations and other side effects of fake data may be yet to be discovered, such novel creations open alternative ways to secure the privacy of user information as well as a safe environment for developers to work in.

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City Matrix Works to Improve Urban Decision Making

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Rapid urbanization is making cities increasingly complex and diverse. The process of community engagement for urban decision-making is often ineffective, uninformed, and occurs only at the end of a project. City Matrix, an Urban Decision-Support System augmented by Artificial Intelligence, is aiming to change that [1].

CityMatrix is formed by digital modules in an optical platform that looks like a chess board with squared Lego instead of chess pieces. These modules can be moved to change land use layouts. Each cell of the board can be transformed into six different types of buildings, streets, and courtyards. The users of City Matrix can add, remove or exchange the existing modules, or pick from an external library of pre-assembled ones, as well as change urban density by manipulating the height and occupancy of buildings [2]. It is like creating a city in a simulation game, where users with the help of AI, can test changes in the manufactured landscape correlated to housing and basic infrastructure. The main idea is with this inviting dynamic to allow regular citizens to simulate changes in their cities and with this be able to participate more intuitively in public participation processes.

03. City Matrix Works to Improve Urban Decision Making

The project, first developed by MIT, was tested in different digital democracy events and projects, allowing regular citizens to use the platform to create and modify their cities as developed public policy. Analysis shows that CityMatrix can help users gain a more in-depth understanding of the city so that they can make better-informed decisions in collaboration with others [1]. The tool itself is not presented as a form of replacing the decision makers work, but it highlights the importance of this process and all its professionals. The CityMatrix project was aimed at providing evidence-based support to a more democratic decision-making structure, that through technology can facilitate the access of regular citizens to the process of improving their own cities. Among its many contributions, the testing of Machine Learning as a possible approach to providing real-time feedback on complex urban simulations is one of the most important, as it can be customized and adapted to different contexts around the world.

When tested, CityMatrix promoted collaborations among different stakeholders and has shown potential solutions to enhance the accessibility and efficiency of citizen participation events. When researchers used CityMatrix they reduced delay costs and improved user experience. Another topic addressed by this project is the importance of using technology to allow rapid response in digital participation platforms. People want to participate in the making of public policy, but as with all political processes, time is sometimes a factor for disengagement.

Providing real-time feedback helps improve the quality of decision-making and design processes, and a system that allows the user to examine the spectrum of design variations quickly does this well. As quantitative calculation becomes intuitive, combining human and machine intelligence and improving the quality of the decision-making process will help improve urban policy making [3].

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Status Quo and Transition of Work from Home Culture

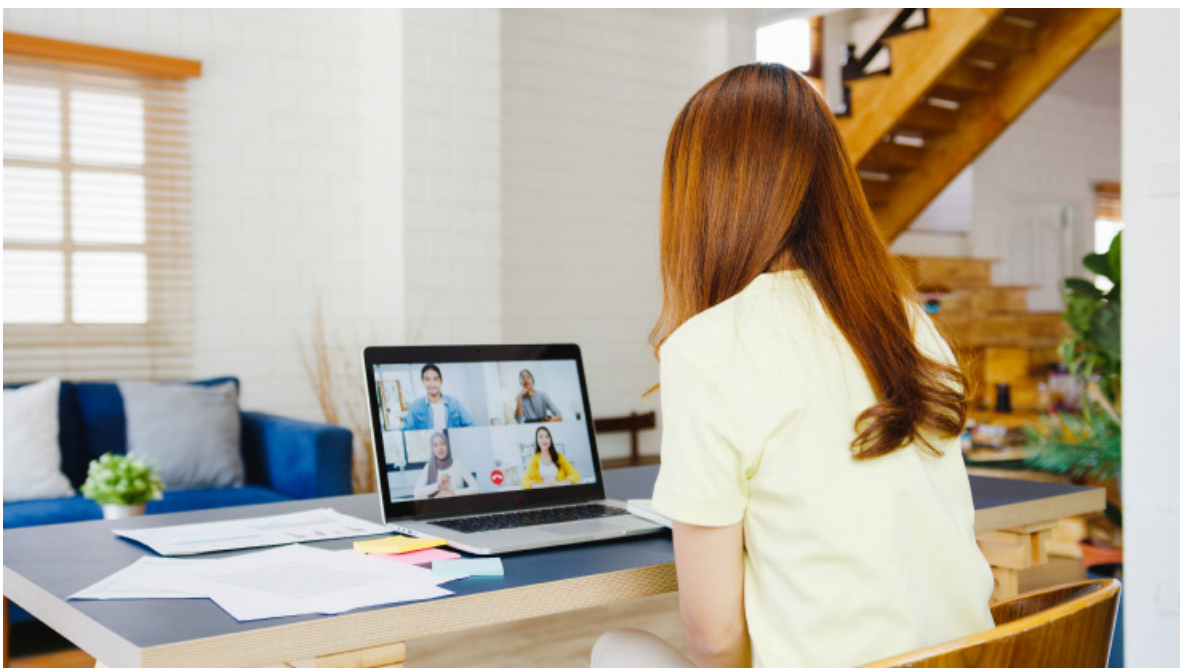
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Pew Research reported that after the COVID-19 pandemic, nearly 60% of U.S. workers who say their job can be done from home were not going into the office most of the time [1]. This boom in WFH has captured the attention of journalists, researchers, and tech startups looking for opportunities.

A recent NBER working paper by Nicholas Bloom, a proponent of WFH, and his co-authors investigates the large-scale impacts [2]. In a randomized control trial of some 1600 workers of a tech firm, the authors find that WFH employees show a significant increase in self-assessed productivity by 1.8%, electronic communication, even when in the office, and lines of code written by 8%. Although some of the results come from self-reported data which are less reliable than controlled data, WFH seems to have a verifiable positive impact on productivity. In fact, the firm where the experiment was conducted has implemented hybrid WFH for the entire company.

With more evidence on the potential benefits of hybrid work and an increasing number of firms that let their employees work from home, tech companies have come up with products to satisfy this growing demand. The astronomical rise of Zoom is one good example but there are many more that have introduced tools allowing smooth WFH. One such example is Cloudbrink, a startup launched in 2019 which provides



04. Status Quo and Transition of Work from Home Culture

software improving internet speed and safety for remote employees. In a recent interview with TechCrunch, Cloudbrink's CEO Prakash Mana revealed that their platform detects deteriorating connection and preemptively replaces dropped packets even before they complete their cycles [3]. As a result, customers enjoy a smooth experience with their regular work software such as Zoom and Salesforce.

While WFH has become an attractive feature, many don't only want to work from home but from other, more remote places. The Economist earlier this year highlighted a trend of working in hotel lobbies, cafes, and even tropical destinations [4]. In such remote spots, however, the author points out some of the potential issues preventing it. One is IT support - nearly impossible to do remotely and can prevent an employee from working until they return to their office for repair. Another is tax administration when working in foreign countries. Not only an administrative headache for the firm's accountants, but also many countries don't have detailed tax codes that would be able to deal with foreign remote workers.

The surge in WFH in recent years has shown that both workers and their employers benefit from more flexible work possibilities which have been greatly enhanced by new technology. A day or two away from the office seems to not have a negative effect on productivity - in fact, there is evidence of a positive effect. The potential problems of WFH come when workers take their work not only to home but to distant locations where they encounter logistical and administrative complications.

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Are Metaverse Concerts the Future?

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With preventive measures such as social distancing and restrictions on gatherings in 2020, many artists responded by providing pre-recorded and streamed concerts through Instagram, Facebook, Zoom and Youtube. While concerts that are held online by real artists and on stage were common ways to provide fans a sense of connection during this challenging time, some took a different approach by conducting virtual concerts via the metaverse. While there are various types of virtual concerts, those that are produced with virtual avatars and a fully digitalized world with graphic backgrounds grabbed the attention of many.

Metaverse virtual concerts existed way before the COVID-19 pandemic. For instance, a virtual duet between Celine Dion and Elvis Presley during the sixth season of American Idol, in 2007, and SM Entertainment, a Korean entertainment agency tried to create a metaverse performance of the boy band H.O.T in 1998. It was not until 2013 that they succeeded in presenting the first performance using 3D holographic technology for “Girl’s Generation V Concert” attracting many fans to the live outdoor show. Other record labels also joined the trend including their biggest rival, YG Entertainment. However, not all the virtual concerts received great responses - some were criticized for not being realistic or the singers not being bubbly as real-life performances. Similar complaints led to the cancelation of projects such as the K-pop cinema



targeting foreign audiences that opened in Sinsa-dong not long after its launch [1].

Due to the advancement of technology, quality of virtual concerts has increased drastically, now having attractive looking avatars, smooth animation, eye-catching sets, and top-notch audio. An example is the Post Malone virtual concert that celebrated Pokemon's 25th anniversary. The concert was 13 minutes long and an avatar of Post Malone is seen dancing around various Pokemon and traversing to different Pokemon worlds. This computer-generated concert received many positive reactions from fans all over the world because of the spectacular visuals and the collaboration between the popular singer and the legendary Pokemon. [2].

Another example of a recent virtual concert is Ariana Grande's was held in Fortnite involving many mini-games. Different from other live-streamed concerts, the audience could take part in playing the games and following the storyline which shows off the aspects of Fortnite. This new concept attracted over 78 million players [3].

Undoubtedly there has been a lot of effort in order to improve the quality and the graphics of these computer-generated concerts. While boosting the visuals is important, it is also crucial for creators to carefully think about the audiences in order to create content that is suitable for different age groups. Nevertheless, it is hoped that the popularity of virtual concerts will increase as we see the digital sphere of AI and the metaverse expand.

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