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**VOLUME: 5 EDITION: 4
OCTOBER 2022**

THE MISSION

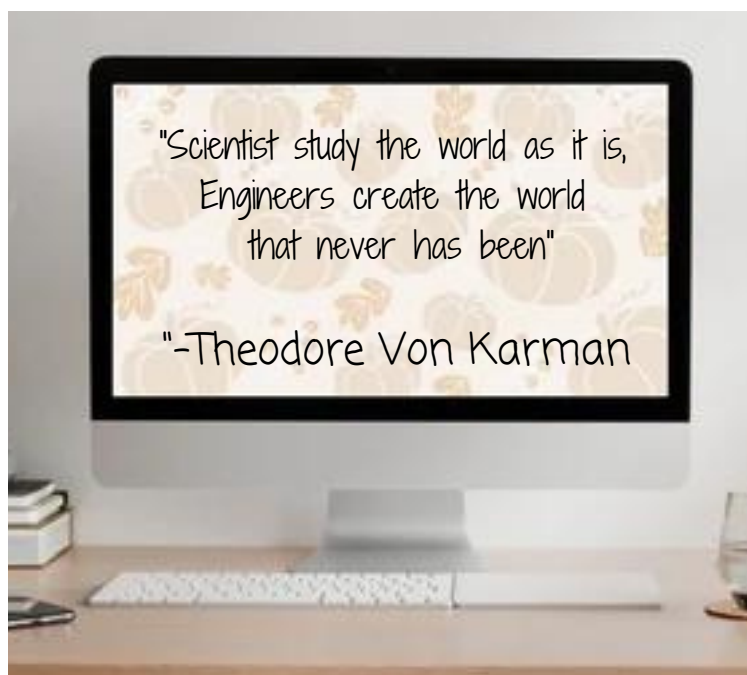
The department is carrying a mission to create and disseminate the knowledge and techniques in the intellectual areas of Engineering and other core areas of Applied Science and Humanities for the betterment of Ecosystem.

To inculcate the importance of Applied Science and develop a natural flair for Engineering and Technology which in turn shall mold students into a competent professional.

THE VISSION

The Department of Applied Science and Humanities committed to dynamically integrate the components Science, Humanities Engineering to groom students to transform them as globally acknowledged professionals.

To keep pace with fast developing scenario of technology and socio economic environment while planning to develop a world class technical institution.



How Electric Vehicle Charging Facilities Should be Planned Depending on the Demand?

Due to the rapidly expanding electric car sector, planning for urban EV charging stations is gaining more and more attention in both the academic and industrial worlds. The planning of charging facilities will be covered in this article, with an emphasis on the two main charging infrastructure types currently in use: slow charging and fast charging.



Even with the rise in electric vehicle research, people have not yet completely switched to EVs due to the lack of charging infrastructure. Developments in the field of power electronics have brought down the charging time for the vehicle to under an hour. But that demands an extensive fast charging infrastructure that is efficiently planned to enable large-scale adoption of EVs. Planning for urban EV charging stations is receiving more and more attention in both the academic and industrial communities as a result of the rapidly growing electric vehicle industry. The two main ways to power electric vehicles are slow charging with charging piles and fast charging in charging stations.

Researchers have proposed different mathematical models to determine an optimal model for EV charging station planning, considering various factors like distance between consecutive charging stations, amount of electric vehicles, road network, traffic information, distribution network structure, capacity constraints in urban areas, and the cost of setting up and running a charging station with an objective to maximize profits. This article will discuss charging facilities planning focused on the two major types of charging infrastructures present—slow charging and fast charging.

With the development of society, environment pollution problem has become more serious. While electric vehicles (EVs) have the characteristics of low pollution and sustainability, so many countries have considered EVs as one of national strategic plans [1-4]. EV charging station is a very important connection between EVs and the corresponding power system. Thus, this paper presents a model based on queuing theory to solve the problem of how to plan the charging station economically.

EV charging station is a very important link in urban planning, and the design of the position and capacity of charging stations are not only to meet the public demand for traveling, but also to maintain the stability of operation and management in power grid. Considering the non-simultaneity and randomness of the EVs arriving at the charging station, the capacity of EV charging stations is calculated by using queuing theory.

What is the demand for electric vehicle charging?

There are several factors that need to be taken into consideration while planning electric vehicle charging infrastructure. The number of electric vehicles in a given area and the pattern of usage will determine the type of charging that people are likely to use. The charging demands are divided into three types – slow, regular, and urgent charging.

Slow charging demands are usually from residential areas where the users use the electric vehicle for short distances. Regular charging demands are fulfilled by high-power-rated chargers that are generally located in commercial buildings. These chargers take about five to seven hours to completely charge the car. They are more expensive as compared to slow chargers because of the high-power-rated infrastructure involved.

Fast charging stations are typically located on roadsides and highways to charge the vehicle on the go. Recent developments have made fast chargers efficient enough to charge the vehicle completely under an hour. But the technology is relatively expensive involving high capital as well as running costs. The following table summarizes the three demand types.

Planning for charging piles for slow and regular demand

At present, the world is vigorously promoting the innovative development concept of “green development, park first,” prompting the park to vigorously promote the construction of electric vehicle charging stations and charging pile projects. However, the development of the construction is not satisfactory due to a series of restrictive factors.

To fulfill the slow and regular charging demands of electric vehicles, charging piles are set up at locations, which are expected to have the highest demand. These include private charging piles in residential neighborhoods, public charging piles in office parking lots and commercial areas. The demand for charging in specific regions determines how charging piles rating and their location should be planned.

Calculating the number of charging piles takes into account factors like charging demand, charging power, daily available time, and the charging pile vacancy rate

Type	Rated Voltage	Rated Current	Applicable place	Charging Demand Type
Level 1	220 V AC	16 A	Home, Working place	Slow Demand
Level 2	220 V AC	32 A	Shopping mall, Parking lots	Regular Demand
Level 3	750 V DC	400 A	Charging stations, Highway service areas	Urgent Demand

Planning of fast charging stations for urgent demands

For urgent charging demands, fast charges located on roadsides can be used with level 3 charging mode. The planning of these fast chargers mainly depends on the road network and the magnitude of demand that it has to be fulfilled. The location of these fast charging stations must allow satisfactory charging services to the electric vehicle owners while at the same time not causing detrimental effects on the grid due to the uncertainty and impulsiveness of the charging demand. Research has shown that the impulsiveness due to the electric vehicle load will result in negative impacts on the power grid, including disruptively varying voltage profiles along the feeder and lifetime depreciation of critical grid equipment.

The traffic and electrical considerations are both equally considered during the planning of fast charging stations, but these two conditions are generally conflicting in nature. From the electrical point of view, it is desirable to locate the fast charging station away from existing loads to minimize the losses and maintain voltage profile. Other connected loads are not affected, but that particular location is likely to be undesirable to many users. Therefore, an integrated planning model needs to be formulated by combining the view of fast charging stations as an impulsive electric load and an extension of human behavior.



Conclusion

With the increasing demand for sustainable and environment-friendly ways of transportation, electric vehicles be it cars, buses, scooters, or rickshaws are the future. Large-scale adoption of electric vehicles is only possible when the necessary charging infrastructure are efficiently planned throughout the country. This article talked about different types of charging demands and the requirements of the electric vehicle user. While slow and regular charging demands were fulfilled by charging piles located in residential and commercial complexes, the fast charging demand is fulfilled by fast charging stations typically located on roadsides. The various factors which are to be considered while setting up these infrastructures were also discussed.

COMPLIED BY: Jenisa Dsilva

SOURCE: <https://www.powerelectronicsnews.com/how-electric-vehicle-charging-facilities-should-be-planned-depending-on-the-demand/>

Why Silicon Valley is so excited about awkward drawings done by artificial intelligence?

Computer programs can now create never-before-seen images in seconds.

Feed one of these programs some words, and it will usually spit out a picture that actually matches the description, no matter how bizarre. The pictures aren't perfect. They often feature hands with extra fingers or digits that bend and curve unnaturally. Image generators have issues with text, coming up with nonsensical signs or making up their own alphabet.



"In the last three months, the words 'generative AI' went from, 'no one even discussed this' to the buzzword du jour," said David Beisel, a venture capitalist at NextView Ventures.

In the past year, generative AI has gotten so much better that it's inspired people to leave their jobs, start new companies and dream about a future where artificial intelligence could power a new generation of tech giants. The field of artificial intelligence has been having a boom phase for the past half-decade or so, but most of those advancements have been related to making sense of existing data. AI models have quickly grown efficient enough to recognize whether there's a cat in a photo you just took on your phone and reliable enough to power results from a Google search engine billions of times per day.

"The impressive part, even for me, is that it's able to compose new stuff," said Boris Dayma, creator of the Craiyon generative AI. "It's not just creating old images, it's new things that can be completely different to what it's seen before."

Sequoia Capital — historically the most successful venture capital firm in the history of the industry, with early bets on companies like Apple and Google — says in a blog post on its website that "Generative AI has the potential to generate trillions of dollars of economic value." The VC firm predicts that generative AI could change every industry that requires humans to create original work, from gaming to advertising to law.

In a twist, Sequoia also notes in the post that the message was partially written by GPT-3, a generative AI that produces text.

KEY POINTS

- Several new programs, commonly called generative AI, released in the past few years can take a single phrase and generate never-before-seen images that match the prompt.
- The pictures are anything but perfect.
- Most programs give you infinite images to choose from, and there's nothing stopping a human from using a generated image as a starting point for a more polished piece.

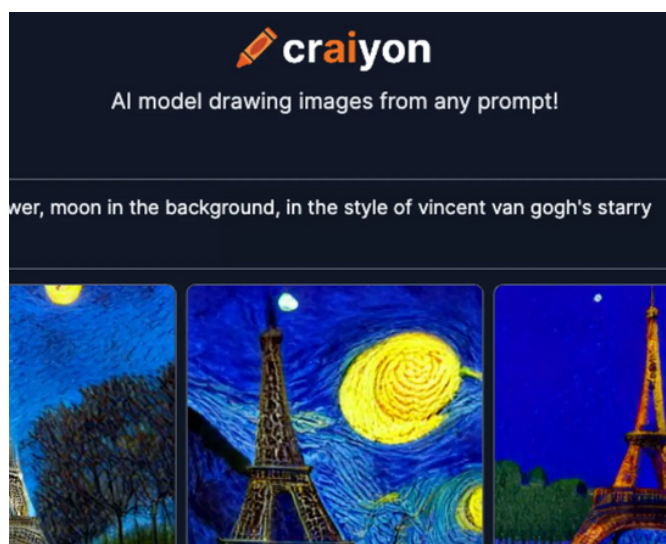
How generative AI works

Image generation uses techniques from a subset of machine learning called deep learning, which has driven most of the advancements in the field of artificial intelligence since a landmark 2012 paper about image classification ignited renewed interest in the technology.

Deep learning uses models trained on large sets of data until the program understands relationships in that data. Then the model can be used for applications, like identifying if a picture has a dog in it, or translating text.

Image generators work by turning this process on its head. Instead of translating from English to French, for example, they translate an English phrase into an image. They usually have two main parts, one that processes the initial phrase, and the second that turns that data into an image.

The first wave of generative AIs was based on an approach called GAN, which stands for generative adversarial networks. GANs were famously used in a tool that generates photos of people who don't exist. Essentially, they work by having two AI models compete against each other to better create an image that fits with a goal.



Newer approaches generally use transformers, which were first described in a 2017 Google paper. It's an emerging technique that can take advantage of bigger datasets that can cost millions of dollars to train.

The first image generator to gain a lot of attention was DALL-E, a program announced in 2021 by OpenAI, a well-funded startup in Silicon Valley. OpenAI released a more powerful version this year.

"With DALL-E 2, that's really the moment when sort of we crossed the uncanny valley," said Christian Cantrell, a developer focusing on generative AI.

Another commonly used AI-based image generator is Craiyon, formerly known as Dall-E Mini, which is available on the web. Users can type in a phrase and see it illustrated in minutes in their browser.

Since launching in July 2021, it's now generating about 10 million images a day, adding up to 1 billion images that have never existed before, according to Dayma. He's made Craiyon his full-time job after usage skyrocketed earlier this year. He says he's focused on using advertising to keep the website free to users because the site's server costs are high.

A Twitter account dedicated to the weirdest and most creative images on Craiyon has over 1 million followers, and regularly serves up images of increasingly improbable or absurd scenes. For example: An Italian sink with a tap that dispenses marinara sauce or Minions fighting in the Vietnam War.

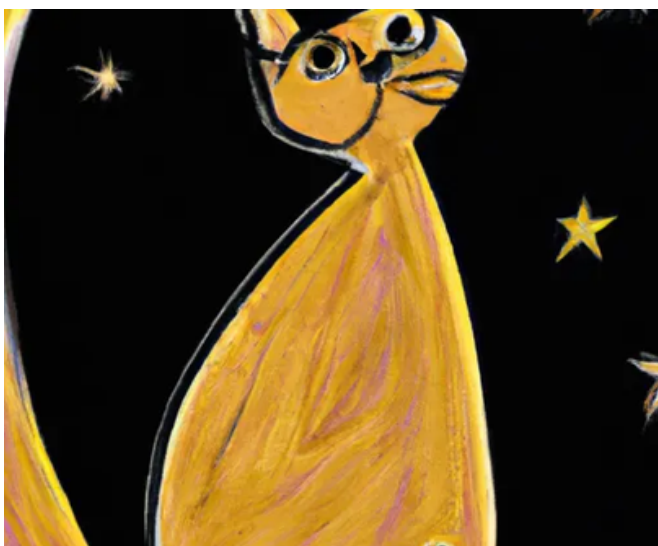
But the program that has inspired the most tinkering is Stable Diffusion, which was released to the public in August. The code for it is available on GitHub and can be run on computers, not just in the cloud or through a programming interface. That has inspired users to tweak the program's code for their own purposes, or build on top of it.

Startups, cloud providers, and chip makers could thrive

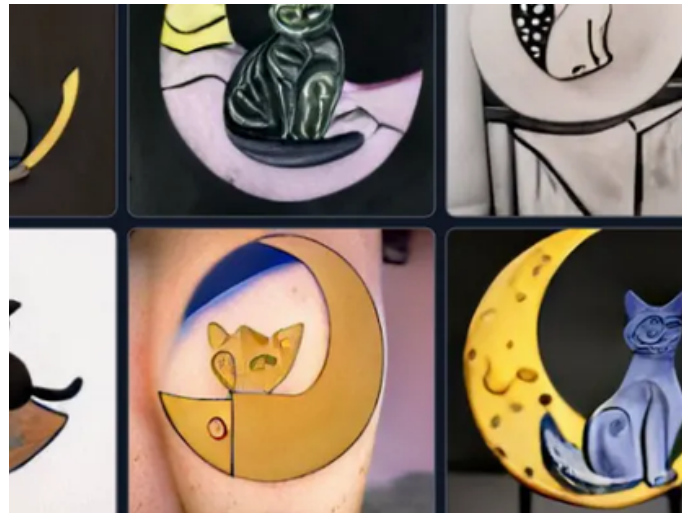
Some investors are looking at generative AI as a potentially transformative platform shift, like the smartphone or the early days of the web. These kinds of shifts greatly expand the total addressable market of people who might be able to use the technology, moving from a few dedicated nerds to business professionals — and eventually everyone else.

“It’s not as though AI hadn’t been around before this — and it wasn’t like we hadn’t had mobile before 2007,” said Beisel, the seed investor. “But it’s like this moment where it just kind of all comes together. That real people, like end-user consumers, can experiment and see something that’s different than it was before.”

Cantrell sees generative machine learning as akin to an even more foundational technology: the database. Originally pioneered by companies like Oracle in the 1970s as a way to store and organize discrete bits of information in clearly delineated rows and columns — think of an enormous Excel spreadsheet, databases have been re-envisioned to store every type of data for every conceivable type of computing application from the web to mobile.



Ethical issues



Ultimately, everyone developing generative AI will have to grapple with some of the ethical issues that come up from image generators.

First, there’s the jobs question. Even though many programs require a powerful graphics processor, computer-generated content is still going to be far less expensive than the work of a professional illustrator, which can cost hundreds of dollars per hour.

That could spell trouble for artists, video producers and other people whose job it is to generate creative work. For example, a person whose job is choosing images for a pitch deck or creating marketing materials could be replaced by a computer program very shortly.

“It turns out, machine-learning models are probably going to start being orders of magnitude better and faster and cheaper than that person,” said Compound VC’s Dempsey.

There are also complicated questions around originality and ownership.

Generative AIs are trained on huge amounts of images, and it’s still being debated in the field and in courts whether the creators of the original images have any copyright claims on images generated to be in the original creator’s style.

Some achievements.

One artist won an art competition in Colorado using an image largely created by a generative AI called MidJourney, although he said in interviews after he won that he processed the image after choosing it from one of hundreds he generated and then tweaking it in Photoshop.

Some images generated by Stable Diffusion seem to have watermarks, suggesting that a part of the original datasets were copyrighted. Some prompt guides recommend using specific living artists' names in prompts in order to get better results that mimic the style of that artist.

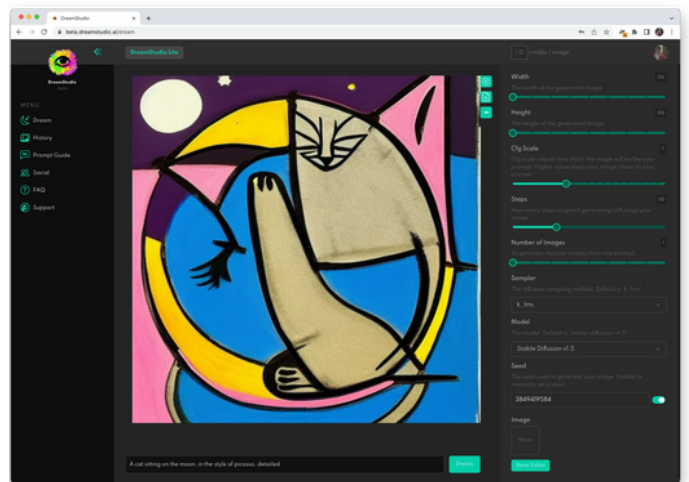
Last month, Getty Images banned users from uploading generative AI images into its stock image database, because it was concerned about legal challenges around copyright.

Image generators can also be used to create new images of trademarked characters or objects, such as the Minions, Marvel characters or the throne from Game of Thrones.

As image-generating software gets better, it also has the potential to be able to fool users into believing false information or to display images or videos of events that never happened.

Developers also have to grapple with the possibility that models trained on large amounts of data may have biases related to gender, race or culture included in the data, which can lead to the model displaying that bias in its output. For its part, Hugging Face, the model-sharing website, publishes materials such as an ethics newsletter and holds talks about responsible development in the AI field.

"What we're seeing with these models is one of the short-term and existing challenges is that because they're probabilistic models, trained on large datasets, they tend to encode a lot of biases," Delangue said, offering an example of a generative AI drawing a picture of a "software engineer" as a white man.



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Source :
<https://www.cnbc.com/2022/10/08/generative-ai-silicon-valleys-next-trillion-dollar-companies.html>