

Nvidia's text-to-image art push could intensify competition in generative AI

Article

The news: Nvidia is entering the text-to-image free-for-all with its **eDiff-I** artificial intelligence generator in an emerging market for Big Tech conglomerates, per VentureBeat.

Cambrian explosion of AI art generators: One of the biggest tech stories of 2022 is how generative AI has quickly evolved from a fringe application into advanced image generation thanks to the likes of **OpenAI's DALL-E 2**, **Google's Imagen**, **Midjourney**, and **Stable Diffusion**.

How it works: These tools use a vast collection of data image supersets to generate AI-created images, graphics, photos, and even short videos based on a string of text descriptions.

AI-generated art has taken various industries by storm, but the caveat is that this is very nascent technology that could be a [legal and ethical minefield](#).

- **Nvidia is combining its expertise in graphics and imaging with eDiff-I's text-to-image synthesis**, which its developers say provides “an instant style transfer and intuitive painting-with-words capabilities.”
- eDiff-I's image synthesis pipeline is a combination of three diffusion models — a base model that can synthesize samples of 64 x 64 resolution and two super-resolution stacks that can upsample the images progressively to 256 x 256 and 1024 x 1024 resolution.
- “It definitely adds to the complexity of training the model, but doesn't significantly increase computational complexity in production use,” **Scott Stephenson**, CEO at **Deepgram**, told [VentureBeat](#).

Nvidia's competitive advantage: Most competing AI art generators such as DALL-E 2 and Imagen use only a single encoder such as **CLIP** or **T5**. eDiff-I's architecture uses both encoders in the same model.

- This could result in larger AI-generated images that use less processing power. eDiff-I also produces higher-resolution images thanks to an advanced denoising algorithm.
- Nvidia's tight integration of hardware, software, apps like Canvas, and plugins for industry tools like **Adobe's Photoshop**, gives it a leg up on the competition.
- The involvement of a hardware vendor like Nvidia could spur competition from the likes of **Samsung**, **Qualcomm**, and **Intel**, further propelling innovation in the space.

Too fast to regulate: As one of the success stories in technology, generative AI has seen the backing of Big Tech companies like [Microsoft](#), [Google](#), and **Amazon**.

- **Generative AI is not as capital intensive to develop compared to hardware and software—it can quickly be improved even during a recession.**

- The sudden ubiquity of the technology can overwhelm regulators studying the ethics and legality of AI-created art. For example, regulators in the UK are struggling to determine how copyright law will address AI art.

Our take: Nvidia's entry into the generative AI art segment qualifies it as a quickly emerging technology with real-world implications.

- Unlike nebulous metaverse-related technologies that seem years away from fruition, expect competition to intensify as companies find myriad ways to productize AI.

Current vs. Expected Adoption of AI Within Select Job Functions at Their Company According to Executives Worldwide, June 2022

% of respondents

	Not using	Piloting use cases	Limited adoption	Widescale adoption	AI is critical
Current adoption					
IT	2%	9%	22%	47%	20%
Supply chain/manufacturing	6%	16%	32%	34%	11%
Product development	6%	17%	42%	23%	11%
HR	4%	19%	42%	23%	10%
Finance	6%	14%	25%	46%	8%
Marketing & advertising	4%	34%	37%	20%	5%
Sales	4%	26%	46%	20%	3%
Expected adoption in 2025					
IT	2%	9%	17%	22%	49%
Finance	3%	10%	22%	21%	43%
Supply chain/manufacturing	4%	8%	18%	30%	38%
HR	3%	11%	19%	39%	27%
Sales	2%	12%	26%	37%	24%
Product development	2%	13%	18%	46%	21%
Marketing & advertising	3%	12%	21%	44%	20%

Note: n=600 in senior technology roles; responses of "not applicable/not sure" not shown; numbers may not add up to 100% due to rounding
Source: MIT Technology Review Insights, "CIO Vision 2025: Bridging the Gap Between BI and AI" sponsored by Databricks, Sep 20, 2022

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