

PUBLIC SUBMISSION

Received: May 27, 2025
Tracking No. mb6-6xlc-bely
Comments Due: May 28,
2025 **Submission Type:** API

Docket: NSF-2025-OGC-0001
NITRD_FRDOC_0001

Comment On: NSF-2025-OGC-0001-0001
Request for Information: Development of a 2025 National Artificial Intelligence Research and Development Strategic Plan

Document: NSF-2025-OGC-0001-DRAFT-0111
Comment on FR Doc # 2025-07332

Submitter Information

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General Comment

Hello, I am a software engineer who wants to strengthen America's position in AI. The attached document contains my comments about the urgent need for US investment in post transformer research including but not limited to neuromorphic architectures, energy based models, quantum AI, etc.

Attachments

AI_Comments

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High Level Ask

The US government, as its AI strategy should supplement big lab AI research by funding smaller researchers to go after high-risk high-reward ideas. That is they should fund researchers to explore radically new ideas and architectures. If the current approaches are right, the big labs will do their thing. To best promote human flourishing, the government should basically hedge for the bear cases of current AI directions. Assume they won't work out and provide basic research in new directions.

BACKGROUND

I believe the AI industry today is overwhelmingly focused on scaling and expanding transformer architectures. This isn't necessarily a bad thing, and it may prove to be true. However, while transformers currently represent the SOTA (state-of-the-art) in most machine learning tasks, this was not always true. Prior to Google's seminal "Attention is All You Need" paper, RNNs, LTSMs, etc. were more used. The transformer architecture was also not initially particularly groundbreaking upon introduction; it wasn't until researchers empirically demonstrated its ability to scale and integration with hardware that the industry fully embraced transformers. Similarly, it is possible that future superior architectures will also be discovered unexpectedly, through experimentation outside mainstream consensus.

JUSTIFICATION

It is important to recognize that America's strategic rivals, notably China, already understand and act upon this principle. China's government is actively funding and supporting research into novel, unconventional AI architectures beyond transformers. In fact, China believes this is how they'll beat us in the AI race.¹

In April the Shanghai government offered funding for researchers advancing towards AGI using new kinds of architectures, such as models that interact with the real world through imagery, others that can control computers with the mind, or as-yet theoretical algorithms to emulate the human brain (Economist)

By diversifying its investment in multiple competing lines of research, China is setting itself up to be the leader of the potential next breakthrough in AI. Historically, the United States also deployed similar diversification strategies when stakes were high, most famously through the Manhattan Project during World War II. Instead of committing entirely to a single theoretical approach, scientists pursued multiple methods in parallel,

¹ <https://www.economist.com/china/2025/05/25/xi-jinpings-plan-to-overtake-america-in-ai>

drastically raising their likelihood of successful breakthroughs. By analogy, investing widely into alternative AI architectures today could similarly accelerate the discovery of critically advantageous technologies tomorrow.

However, the current landscape in the AI research industry is largely concentrated around transformers. Let me be clear, this is not necessarily a bad thing! They may work out well and that's great. However this means American government does not currently need to direct additional funding into transformers themselves, since privately funded efforts in this domain are already robust. They should simply step out of the way of big labs, and let them scale up compute, energy infrastructure, and reduce regulatory burden.

Instead, the avenue for more direct government support is the exploration of alternative and riskier architectures. Academic research labs have limited access to computational resources. They may want to test more novel ideas, but they do not have the compute. Big labs have lower tolerance for risk-taking since they have a lot of fomo (fear of missing out). The US government should create US *compute-grants* that allow researchers access to training runs at US owned and headquartered cloud providers. These will give researchers ample training compute to freely test their more novel ideas.

POLICY SUGGESTIONS

There are specific pathways the government could fund immediately. Examples include architectures explicitly designed for efficient lifelong learning, energy efficiency, human-like reasoning, symbolic integration, brain-inspired approaches (such as neuromorphic computing), uncertainty estimation, energy based models, quantum AI, and hybrid symbolic-neural frameworks. US compute grants should focus on these ideas, though not limited to them. Compute grants should be modeled after the NIH HRHR (high risk high reward) program. They should not require much preliminary data to emphasize risk taking. The compute vouchers should apply to a variety of data providers, though should be limited to US based data centers. Consider an expert review panel that reviews projects after a set time (say 3 years) to assure they are going in correct directions. For smaller compute allocations, review should be particularly rapid to encourage novel ideas. Larger ones can have more scrutiny. This program should be an expansion under the NAIRR (National Artificial Intelligence Research Resource), an existing shared compute infrastructure. Note, I believe there is ample datacenter infrastructure in existence, so I specifically do not recommend the government build their own datacenters. They should instead focus on compute grants.

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