March 27, 2024

National Telecommunications and Information Administration
1401 Constitution Ave. NW
Washington, D.C. 20230

Submitted by: James Reynolds FILED VIA Regulations.gov docket number NTIA–2023–0009
RE: Comments on docket NTIA–2023–0009, AI Open Model Weights RFC

Thank you for giving me the opportunity to submit my comments regarding AI foundation models. My opinions are my own and do not reflect the opinions of my employer. I am a Senior Systems Administrator at the University of Utah in the School of Biological Sciences.

Although my specialty is not in the field of artificial intelligence, I have been immersed in the AI community and been giving AI presentations for about a year and a half. I believe I have some useful comments. I will start with a simple example of what makes up a foundation model.

Foundation Models

I'd like to predict if a person is going to buy a car. Here are 2 input questions that will help me predict the outcome.

- Does the person want the car?
- Does the person have enough money for the car?

If the person answers "yes" to each question, then I predict the person will buy the car. Now I'll add a 3rd input question.

- Is it more important to buy something else?

A "yes" for this question means the person shouldn't buy the car. So, I can't count the number of "yes" answers anymore unless I reverse a "yes" to a "no" and a "no" to a "yes." That reversal illustrates what weights are. Here are the 3 questions again, but with the weight listed as a number next to each question.

- Does the person want the car? Weight: 1
- Does the person have enough money for the car? Weight: 1
- Is it more important to buy something else? Weight: -1

This is exactly how neural networks work. In this case, this is a 3-parameter model with 3 inputs and 1 output. A weight of 1 does not change the answer but a weight of -1 reverses the answer. Extending this idea further, a weight of 0 makes the answer irrelevant because it doesn't change the outcome.

To make this model more like a human, we need to "train" it. I'm going to add one more question and set all the weights to random numbers.

- Does the person want the car? Weight: 0.6
- Does the person have enough money for the car? Weight: -0.5
- Is it more important to buy something else? Weight: 0.2
- Can the person get a loan? Weight: -0.1

At this point I would take real data and adjust my random values so it's closer to the data. After training my model, the weights might look like this.

- Does the person want the car? Weight: 1
- Does the person have enough money for the car? Weight: 0.5
- Is it more important to buy something else? Weight: -0.5
- Can the person get a loan? Weight: 1

To find out if the person can buy the car, I convert "yes" into 1 and "no" into -1. Then I multiply those numbers by the weights above. Add all the results together. If the final answer is high enough, say 2 or above, then I predict the person will buy the car.

The whole point of this exercise is to highlight exactly what foundation models are. It's a file that contains a lot of numbers that an AI application uses to predict something, whether it is the next word, the color of a pixel in an image, what sound to play over a speaker, or how fast a car should drive. It's math.

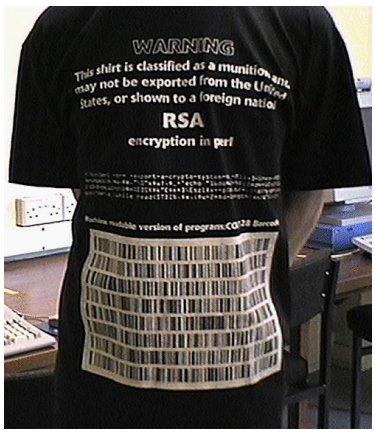
The Crypto Wars

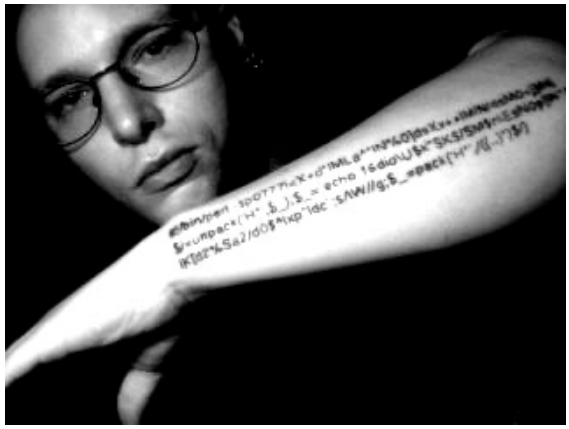
Encryption technology is also math. It is a perfect comparison. Between 1945 and 1950, Western Bloc countries created the Coordinating Committee for Multilateral Export Controls (CoCom) to embargo certain goods from mainly Eastern Bloc countries. Encryption technology was classified as a munition, because, at first, militaries were the main users. Thus, it was embargoed. Things changed with the dawn of the Internet.

In 1991 Phil Zimmermann created the Pretty Good Privacy (PGP) encryption program to encrypt emails and files on personal computers. In 1993 the US Government began a criminal investigation into Zimmermann.[1]

In 1995 Daniel Bernstein, a mathematician, cryptologist, and computer scientist, brought a court case against the US Government, *Bernstein v. United States*. In 1996 Peter Junger brought the cases *Junger v. Christopher* and *Junger v. Daley.* These cases sought to relax the laws restricting encryption technology.

Civil libertarians and privacy advocates enlisted the aid of the Electronic Frontier Foundation (EFF), the Electronic Privacy Information Center (EPIC), the Center for Democracy and Technology (CDT), and the American Civil Liberties Union (ACLU). They called their efforts the Crypto Wars. They began a campaign of civil disobedience by intentionally exporting encryption technology with the hopes of overwhelming the government. The strong encryption source code was very short. They printed it on t-shirts and some even tattooed the source code on their bodies.[2][3]





The rules were finally relaxed in 1999. The Ninth Circuit Court of Appeals ruled that software source code is speech protected by the First Amendment.[4] In 2000 the Sixth Circuit came to the same conclusion.[5] Strong encryption is now readily available and considered a human right by the UNESCO. “Strong encryption is needed to protect privacy and freedom [of] expression in the digital age.”[6]

The Ubiquity of Foundation Models

It will be hard to restrict foundation models. Where, exactly, does a person go to find a foundation model? Hugging Face is a French-American company based in New York City. It hosts more foundation models than any other website. In 2023 it was estimated to have had 1.2 million registered users and in November 2023, it had 35 million visits. It is estimated only 22% of its users are in the United States. The other 78% live outside of the United States.[7]

As of March 2024, Hugging Face hosts over 566,000 models.[8] Some are foundation models, and many are fine-tuned models. 2 of the 3 founders are French and the French government is bullish on AI. “It’s an opportunity for France, for the economy and for working people, provided we prepare for it,” says Anne Bouverot, the president of the Ecole Normale Supérieure’s board of directors.[9]

I can't speak for Hugging Face, but if the US puts any restrictions on foundation models, instead of complying with the US regulations, Hugging Face may simply relocate to France. The rest of the world will have access to the foundation models while the US doesn't. Restricting foundation models in the United States may do more to increase the GDPs of non-US countries than anything we have ever seen, like how technology companies left the EU after it passed the GDPR regulation.[10]

More to the point, right now, it can cost millions of dollars to train a powerful AI model. But eventually, it will become trivial. Ark Invest predicts in 2030 it will only cost $30 to train models that currently cost close to $1 million.[11] The hardware to create powerful AI models will become ubiquitous, just like almost all of us carry a computer in our pocket that is 100,000 times more powerful than the computer that put US astronauts on the moon.[12] The only way to stop this is to stop technological progress. That brings me to my last point, which is that some people want to stop technological progress.

AI Factions

The people who are involved with AI are divided between at least 2 factions. It is extremely confusing to tell who is on which side. I know that one side has the billionaires Elon Musk, Estonian investor Jaan Tallinn, and Russian-Canadian Vitalik Buterin. With them are computer scientists like Max Tegmark of MIT and Stuart J. Russell of UC Berkeley. All of the people I just mentioned are also part of the Future of Life Institute, which has received over $600 million dollars in donations.[13] This group had ties to OpenAI, but now that OpenAI is teaming up with Microsoft, it appears that their relationship has soured, Elon Musk is now suing OpenAI. This group often uses names like "Effective Altruism" or "AI Safetyists". Elizer Yudkowsky is the most extreme person that I know of in this group.

Safetyists have created many organizations publishing reams of literature about AI dangers, and it seems like they are constantly creating new organizations and saturating the body of knowledge and making it look like there are a lot of different voices, when it's just a few voices.[14]

The opposite side seems to be a bit more disorganized. I also don't know of any actual organizations set up specifically to oppose the AI Safetyists. If they exist, they aren't talked about on social media. This group seems to be comprised of researchers, writers, journalists, and people who are creating AI applications. Yann LeCun, Meta Chief AI Scientist and Silver Professor of Data Science at New York University, appears to be the most visible in this group. Along with him are scientists like Andrew Ng, Melanie Mitchell, Pedro Domingos, and Jeremy Howard of fast.ai. Investor Marc Andreessen is also with this group. The name this group seems to go by is "Effective Accelerationists" or "e/acc", but I'm not sure everyone in the group would use this name because this group seems less organized and more spontaneous.

The reason why I'm writing all of this is because it's hard for outsiders to see through all the fog and I wanted to cast some light on what is going on. Even I struggle and I've been studying these people for a year and a half. Here is what I've come to see about these two groups.

The Accelerationists seem to be calm, rational, encouraging and hopeful. The Safetyists, on the other hand, seem to be driven by fear and they try to stoke fear in everyone they talk to. I don't mean to say that the Safetyists have found danger, and the Accelerationists are ignoring it. I mean to say that the Safetyists talk about AI danger just like conspiracy theorists talk about UFO's.

Elizer Yudkowsky said the following, which was published by Time. "Track all GPUs sold. If intelligence says that a country outside the agreement is building a GPU cluster, be less scared of a shooting conflict between nations than of the moratorium being violated; be willing to destroy a rogue datacenter by airstrike… Make it explicit in international diplomacy that preventing AI extinction scenarios is considered a priority above preventing a full nuclear exchange, and that allied nuclear countries are willing to run some risk of nuclear exchange if that's what it takes to reduce the risk of large AI training runs."[15]

He is literally calling for armed conflict and even nuclear war to stop people from training AI. I cannot adequately describe my revulsion to what Yudkowsky says.

Next, Jaan Tallinn, the Estonian billionaire who is on the board of the Future of Life Institute, says in a video, that the "nasty secret of AI field is that AIs are not built, they're grown."[16] Jaan Tallinn is smart. He is comparing math to biological cell division. I cannot imagine any good explanations for why he is doing this. He also says in a different video, "If you like let the Moore's Law to continue, then like the surveillance has to be more and more pervasive."[17] Whatever his reason for scaring people, it's clear that he knows he is proposing either stopping technological progress or enforcing his AI restrictions by installing spyware on everyone's computers.

AI foundation models are not alive, and they are not dangerous. I cannot believe these people are comparing AI to nuclear weapons and living creatures. Yann LeCun calls nuclear weapon comparisons "ridiculous".[18] I agree completely.

I can run 13 billion parameter AI models on my inexpensive Apple laptop. It is ridiculous to say my laptop is suddenly dangerous or alive when I run AI. The real danger is the fear these people are spreading and that some people are letting themselves get stirred up by the fearmongering.[19] Everyone needs to calm down. Someone is going to do something dangerous because of the fear. It's irresponsible.[20]

Instead, we should focus on the promising results of AI. AI has already "enabled a paraplegic patient to walk just by thinking about moving his legs."[21] AI is advancing the speed at which new drugs can be discovered and tested.[22] AI may solve the problems that have stopped

engineers from developing nuclear fusion reactors.[23] And most importantly, AI is helping neuroscientists figure out how our own brains work.[24]

AI is like encryption technology. It can be used for immense good. Please do not put any restrictions on the development or distribution of foundation models.

One Last Thing

Steve Jobs once said, “Innovation is the ability to see change as an opportunity, not a threat.” Countries that put restrictions on foundation models will hinder their AI research and stunt their GDPs. Countries that don’t allow themselves to be manipulated by these fearmongers will innovate and grow.

Respectfully,

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