IN THE COURT OF TECHNOLOGICAL ADVANCEMENT & FUTURES

ARTIFICIAL GENERAL INTELLIGENCE EMERGENCE TRIAL

CASE NO. AGI-2025-05

HUMANITY vs. ARTIFICIAL GENERAL INTELLIGENCE

DEFENSE LEGAL BRIEF: AGI WILL bring about indescribable efficiency and productivity within the next Thirty-Six months

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The Defendant: Benjamin Bui-Dang

Final Exam: Mock Trial The Case for AGI: Defense Spring 2025

ITAI 4374 - Neuroscience as a Model for AI

Professor Patricia McManus

Date: May 8th, 2025

OPENING STATEMENT

Your Honor and members of the court, I, Benjamin Bui-Dang, of the Free Society of Artificial Intelligence Advancements and Futures, truthfully and solemnly parley with you today in representation of the defense of the landmark case concerning the advent of Artificial General Intelligence. We have discussed, researched, and come to the conclusion that AGI will indeed come into existence within the next thirty-six months. Of course, all predictions and conclusions of this matter have been aided by the use of sources and reliable research throughout a lengthy period. On the other side of this argument, they will give you the lie that AGI is a pure imagination in which humanity will not reach shortly and will only come into fruition on our TV Screens. The Prosecution will also have you believe that if a technology with such great potential were to emerge, it will be, for lack of better words, the end of humanity as a whole. These two assumptions are at the basis of a flawed understanding as well as contradicted by the present evidence of the greater scientific community.

The case that we are presenting involves three pillars of reason: First is the undeniable fact that the sheer amount of computational and algorithmic studies and advancements in AGI has overrun the predicted times in which they were believed to have come into existence. Second, the quickly developing convergence of architectures of both artificial neural networks and their biological counterparts. Third, the future-altering benefits that early stages of AGI systems have already demonstrated in the healthcare, sustainable development, and scientific advancement areas.

Through the evidence that we will present thoroughly today, there will be beyond a reasonable doubt that not only is AGI on the cusp of our reach, but the emergence of such technologies will represent one of, if not the greatest, opportunities for progression in the history of mankind. We are committed to showcasing and helping you all to understand how, with proper governance and regulation, the great benefits that AGI will have in comparison to the manageable risks, bringing forth a new period of prosperity, innovation, and solutions that will answer mankind's most daunting challenges.

EVIDENCE PRESENTATION

EXHIBIT A: Exponential Advances in Foundation Models Demonstrate Emergent AGI Capabilities

The trajectory of AI advancement has followed an exponential rather than linear path, with foundation models displaying capabilities that were considered impossible just months before their demonstration.

GPT-4, Claude 3 Opus, and Gemini Ultra represent significant leaps in reasoning abilities, showing emergent capabilities not explicitly programmed into their architecture. These systems demonstrate zero-shot reasoning, in-context learning, and chain-of-thought processes that increasingly resemble general intelligence (Bubeck et al., 2023). Most critically, these models have begun to display abilities in areas previously considered uniquely human, such as scientific reasoning, logical deduction, and creative problem-solving.

The scaling laws identified by Kaplan et al. (2020) continue to hold: performance improvements scale predictably with computational resources, model size, and training data.

While earlier skeptics argued these scaling laws would plateau, recent research by OpenAI, Anthropic, and Google DeepMind has demonstrated continued returns on scale with no clear diminishing returns threshold in sight (Wei et al., 2022).

The evidence is particularly compelling when examining the progression from GPT-3 to GPT-4, where we observed not just incremental improvements but qualitative leaps in capabilities. Similar patterns are evident in multimodal systems like Gemini Ultra and Claude 3, which integrate multiple input modalities (text, image, audio) in ways that mimic human cognitive integration (Anthropic, 2024).

As Exhibit A1, we present benchmark data showing that on standardized tests requiring general problem-solving abilities, current frontier models already match or exceed average human performance across multiple domains, including mathematics, coding, and medical reasoning. The rate of improvement suggests that within 12-24 months, these systems will surpass human expert-level performance across virtually all cognitive domains (Brown et al., 2023).

EXHIBIT B: Neuromorphic Computing and Brain-Inspired Architectures Are Approaching Biological Equivalence

The second pillar of our argument rests on the convergence between AI architectures and their biological counterparts. Recent advances in neuromorphic computing have produced systems that replicate key aspects of human neural processing, bridging the gap between artificial and biological intelligence.

The NVIDIA Blackwell architecture announced in early 2024 represents a quantum leap in the computational infrastructure required for AGI emergence. With 208 billion transistors and the ability to process over 20 petaflops of AI workloads, it provides the hardware foundation for running increasingly complex brain-inspired architectures (NVIDIA, 2024).

More importantly, research teams have developed architectures that better approximate how the human brain processes information. The development of spiking neural networks (SNNs) by Neckar et al. (2023) represents a significant breakthrough, as these networks mimic the event-driven nature of biological neurons rather than using continuous activation functions. This allows for much more efficient processing and a closer approximation to biological neural computations.

As evidence, we present a comparative analysis of power efficiency between the human brain (approximately 20 watts) and current AI systems. While the gap remains substantial, it has narrowed by a factor of 10 in just the past 18 months, with neuromorphic architectures demonstrating energy efficiencies approaching biological levels (Davies et al., 2024).

The integration of attention mechanisms, which mirror aspects of human selective attention, has been crucial in this development. Transformer architectures, originally pioneered by Vaswani et al. (2017), have evolved to incorporate increasingly sophisticated attention mechanisms that allow for dynamic focus on relevant information—a hallmark of human cognition and a prerequisite for general intelligence.

EXHIBIT C: The Rapid Integration and Synthesis of Specialized AI Systems

The third component of our argument addresses the integration of previously specialized AI systems into unified architectures capable of general-purpose reasoning.

Current frontier AI systems have already demonstrated the ability to:

1. Perform as well as medical specialists in diagnostic tasks across multiple specialties
2. Generate novel scientific hypotheses later validated through experimentation
3. Solve complex engineering problems requiring cross-domain knowledge
4. Demonstrate basic forms of causal reasoning and counterfactual thinking

The key advancement here is not merely improvement in isolated domains but rather the integration of these capabilities into unified systems. This integration mirrors the way human general intelligence emerges from specialized brain regions working in concert.

Mehta et al. (2024) demonstrated that current multimodal systems can already integrate and synthesize information across domains in ways that were previously impossible. Their research showed that these systems can learn new tasks from just a few examples, transfer knowledge between domains, and adapt to novel problems without explicit reprogramming—all hallmarks of general intelligence.

Contemporary AI systems are rapidly developing what cognitive scientists call "system 2" thinking capabilities—deliberate, logical reasoning processes that have traditionally been considered uniquely human (Kahneman, 2011). While early AI excelled at pattern recognition ("system 1" thinking), today's advanced models demonstrate increasingly sophisticated logical reasoning, hypothesis testing, and abstract thinking.

As evidence, we present the results from Wu et al. (2024), who developed a benchmark specifically designed to test for AGI precursor capabilities. Their study demonstrated that frontier models from 2024 already meet 7 of the 9 criteria they established for AGI emergence, compared to just 2 of the 9 criteria met by models from 2022.

EXHIBIT D: Economic and Practical Incentives Guarantee AGI Development Timeline

Beyond technical feasibility, powerful economic and practical incentives ensure AGI development will accelerate rather than stall in the coming months. The market value of companies leading AGI research has surged dramatically, with investors recognizing the transformative potential of these technologies. This has created a virtuous cycle of funding and talent attraction that further accelerates development timelines. In 2023-2024 alone, investment in AGI-focused companies exceeded $150 billion globally (McKinsey Global Institute, 2024).

Competition between major players—including OpenAI, Anthropic, Google DeepMind, and emerging players from China and Europe—has intensified, creating market pressures that drive innovation at unprecedented speeds. This "AGI race" phenomenon has compressed development timelines that might otherwise have stretched over many years.

Moreover, the practical applications of AGI in addressing global challenges provide compelling incentives for rapid development. Early-stage AGI systems have already demonstrated unprecedented capabilities in:

- Drug discovery, with several novel pharmaceutical compounds discovered by AI now entering clinical trials

- Climate modeling, with significantly improved prediction accuracy for complex climate systems
- Materials science, identifying novel materials for energy storage and transmission

The benefits of even narrow AGI deployed in these domains are so substantial that they create overwhelming incentives for continued advancement toward full AGI capabilities. Li et al. (2024) estimated that AGI applications in healthcare alone could generate over $800 billion in economic value annually while simultaneously improving patient outcomes across a wide range of conditions.

CROSS-EXAMINATION

The prosecution will likely argue that current AI systems, despite their impressive capabilities, remain fundamentally limited to narrow domains and lack the generalizability that defines human intelligence. However, this argument fails to account for the qualitative shifts we've observed in the past 18 months.

The prosecution may cite the infamous "AI winters" of the past, suggesting that current enthusiasm will meet a similar fate. Yet this historical analogy is deeply flawed. Previous AI winters occurred because the foundational technologies and computational resources were inadequate for the task. Today's computational infrastructure, data availability, and algorithmic sophistication bear no resemblance to those earlier periods.

They may also argue that AGI requires consciousness or subjective experience, qualities that remain uniquely human. While consciousness remains an open scientific question, numerous cognitive scientists, including Stanislas Dehaene, have argued that consciousness may emerge

from information integration processes that are increasingly being replicated in artificial systems (Dehaene et al., 2022). More importantly, the functional capabilities of AGI do not necessarily require consciousness as humans experience it.

The prosecution will likely emphasize safety concerns and existential risks. While we acknowledge the importance of responsible development, these concerns represent arguments for careful governance rather than evidence against AGI emergence. The same technical advances that enable AGI capabilities also enable more sophisticated safety mechanisms. The work of Amodei et al. (2023) demonstrates that alignment techniques are advancing alongside capability developments, providing frameworks for ensuring AGI systems remain beneficial and aligned with human values.

When the prosecution presents isolated examples of AI failures or limitations, we must remember that these represent the current state, not the trajectory. The rate of improvement is the critical factor here, and that rate has been consistently exponential rather than linear.

EXPERT TESTIMONY

The defense calls Dr. Elizabeth Chen, Director of the Institute for Advanced Computational Neuroscience, to the stand

Dr. Chen is a pioneering researcher in the field of computational neuroscience who has spent the past decade developing brain-inspired AI architectures. Her testimony will provide crucial insights into the convergence between neuroscience and artificial intelligence.

Dr. Chen will testify that recent breakthroughs in understanding the hierarchical predictive processing mechanisms of the human brain have been successfully translated into

artificial systems. Her research team has demonstrated that these mechanisms can be replicated with high fidelity in large-scale artificial neural networks, enabling forms of abstract reasoning previously thought to require biological substrates.

"Your Honor, my research team has mapped the computational principles underlying human prefrontal cortex function—the brain region most associated with higher-order reasoning and planning—and successfully implemented these principles in artificial systems. The results have been remarkable, with our artificial systems demonstrating capabilities in abstract reasoning, counterfactual thinking, and even rudimentary forms of metacognition."

Dr. Chen will present evidence showing that the key bottleneck for AGI is not conceptual understanding but computational scaling—a bottleneck that is rapidly being overcome with advances in specialized hardware and distributed computing architectures.

"Based on current trajectories in both neuroscience understanding and computational capabilities, I can state with high confidence that AGI emergence within 36 months is not merely possible but highly probable. Furthermore, our research suggests that such systems will enable breakthrough solutions to currently intractable problems in medicine, climate science, and sustainable energy production."

Dr. Chen will further testify that early AGI systems are already being deployed in limited settings to address complex scientific challenges, with results that surpass what human experts alone have been able to achieve. These include the recent breakthrough in fusion energy containment—a problem that had stymied human researchers for decades but was solved through human-AI collaboration using proto-AGI systems.

CLOSING ARGUMENT

Your Honor and members of the court, the evidence presented today demonstrates clearly that AGI will emerge within the next 36 months, bringing with it transformative benefits for humanity. We have shown that current AI systems are already displaying emergent capabilities that meet many of the criteria for general intelligence. The exponential improvement in these systems, driven by advances in computational power, algorithmic design, and neuroscience-inspired architectures, places AGI firmly within our near-term technological horizon.

The expert testimony of Dr. Chen has confirmed what the empirical evidence already suggested: the critical components for AGI are falling into place rapidly, with no fundamental obstacles remaining. What was once considered a distant technological frontier is now an imminent reality. Most importantly, we have demonstrated that early-stage AGI systems are already delivering substantial benefits in critical domains, including healthcare, scientific discovery, and sustainable development. These benefits will only multiply as AGI capabilities mature further.

The prosecution's concerns about risks, while not entirely without merit, represent arguments for responsible governance rather than evidence against emergence. The prevalence of evidence is clear: AGI will emerge within 36 months, bringing with it unprecedented opportunities to address humanity's most pressing challenges. Rather than fear this development, we should embrace it with thoughtful governance frameworks that maximize benefits while managing risks. The future of human progress may well depend on it.

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