A Modern Space Race:
How Recent Investment into AI Signifies the Brand-New Global Race
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Throughout the 20th Century, pioneering scientists and engineers were pushed to their limits by their respective national Governments to achieve monumental goals in the exploration and conquering of space. Kicked off by the launch of Sputnik and culminating with Apollo 11 and the first ever human to walk on the moon, this era is affectionately referred to as "the Space Race." While this time in U.S. history is often associated with nationalistic nostalgia and as being a symbol of pride for the era, the origins of the period are also well known to have come from much more cynical motives of national security, fueled by the Cold War. In the late 1950s, only a few years prior to John F. Kennedy's famous declaration in front of 40,000 people that America would reach the moon by the end of the 1960s, senior officials of the United States Air Force attempted to fast-track an ongoing project to drop a hydrogen bomb on the moon.[1] The project, known as "Project A119," was intended as a "show of force" by the U.S. against the Soviet Union, and notable physicists, such as Carl Sagan, were involved in the project.[2] These dual motives are further exemplified by the strong contrast in innovations that arose from the Cold War drama. While citizens gained lasting inventions (wireless headsets, LED lighting, portable cordless vacuums, freeze-dried foods, memory foam, scratch-resistant eyeglass lenses)[3], so too did the military with the development and creation of weapons such as the Intercontinental Ballistic Missiles ("ICBM's").[4]

As we now enter the 21st Century, a new technological race has begun. Instead of being pushed to explore the infinite vacuum of space, engineers are now scrambling to conquer the new endless frontier of artificial intelligence ("AI"). Countries around the world are now investing trillions of dollars for research and development in the field. Being faced with the choice of keeping up or falling behind, governments are having to exponentially expand their investments. The news of Germany's AI investment illuminates just how deep the gap is between them and the global leaders. German Research Minister Bettina Stark-Watzinger announced this week that Germany plans to invest a near $1 billion dollars into AI over the next two years[5], a near doubling of their current investment plans. Minister Stark-Watzinger herself stated the intention of the investment was to utilize AI to take a "global leading position," and hopes that European regulations emphasizing privacy and transparency will give the country a "competitive advantage."[6]

Even with Germany's commitment to substantially increase spending, this alone does not compare to the major competitors leading the charge. AI spending by the U.S. government

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[1] Mark Piesing, *The Crazy Plan to Explode a Nuclear Bomb on the Moon BBC Future*, BBC (May 8, 2023), https://www.bbc.com/future/article/20230505-the-crazy-plan-to-explode-a-nuclear-bomb-on-the-moon.

[2] *Id.*

[3] Sam Daley, *36 Artificial Intelligence Examples Shaking Up Business Across Industries*, BUILT IN (February 17, 2023), https://builtin.com/artificial-intelligence/examples-ai-in-industry.

[4] John E. Shaw, *The Influence of Space Power upon History 1944-1998*, 46 AIR POWER HISTORY 20, 3 (1999).

[5] David Matthews, *Germany Promises Huge Boost in Artificial Intelligence Research Funding and European Coordination*, SCIENCE BUSINESS (August 31, 2023), https://sciencebusiness.net/news/ai/germany-promises-huge-boost-artificial-intelligence-research-funding-and-european#:~:text=Germany%20is%20promising%20to%20spend,groups%20and%20150%20new%20professorships.

[6] *Id*.

reached $3.3 billion for the 2022 fiscal year according to a new study conducted by Stanford University.[7] China, the other leading country in the field of AI, spent between $2-$8 billion on AI R&D in 2018 alone.[8] Comparing the spending of the U.S. and China to the estimated $1 billion to be spent by Germany over the course of the next two years shows that the gap is a stark one. Furthermore, commentators expect the application of Germany's spending to be underwhelming, noting that only 15% of German companies actually utilize AI.[9] The U.S. and China on the other hand retain further advantages by housing billion-dollar tech companies "willing to throw tens of millions of dollars at AI development."[10]

Similar to the Cold War, two countries sit atop, dwarfing all below, making the comparison to the Cold War all the stronger. While before it was the U.S. and the USSR, today it is the U.S. and China. As was the case in the 20th century, though intentions may be inclusive of innovation's sake, there is once again an underlying motivation that mirrors that of the Cold War era competition, that of national security. For proof of these motives, look no further than to the entities who are incurring these incomprehensibly large bills. For the U.S., the Pentagon is requesting $1.8 Billion for AI machine and learning, and[11] out of the previously mentioned $2-$8 billion 2018 budget for China's AI R&D, China spent up to $2.7 Billion of it towards defense spending.[12]

Furthermore, the juxtaposing military and civilian innovations from the Space Race are mirrored with the innovations in AI. For civilians, the Space Race introduced countless of innovations such as wireless headsets, LED lighting, portable cordless vacuums, freeze-dried foods, memory foam, scratch-resistant eyeglass lenses and more.[13] AI investment has similarly ushered in smart cars, text-to-speech options, and of course the notorious ChatGPT.[14] From a defense standpoint, AI is being used at the front line of the current war in Ukraine, "sift[ing] through satellite images," allowing the military to "make decisions faster, and then target the enemy faster and more accurately."[15]

Similar to the development of ICBMs as a product of the Space Race, this type of militaristic advancement is raising some ethics concerns, particularly drone usage, a controversial topic in modern warfare. Currently, drone technology possesses "all of the components needed to build fully autonomous weapons that can go out over the battlefield, find their own targets, and then all on their own attack those targets without any further human intervention."[16] The ethical concerns surrounding drone usage is an ongoing debate that was born from their very initial use, particularly due to their collateral damage involving the deaths of

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[7] *Germany Plans to Double AI Funding in Race with China, U.S.*, REUTERS (August 23, 2023), https://www.reuters.com/technology/germany-plans-double-ai-funding-race-with-china-us-2023-08-23/.

[8] Ashwin Acharya & Zachary Arnold, CSET CENTER FOR SECURITY AND EMERGING TECHNOLOGY (2019), https://cset.georgetown.edu/publication/chinese-public-ai-rd-spending-provisional-findings

[9] Matthews, *supra* note 5.

[10] *Id.*

[11] Jon Harper, *Pentagon Requesting More Than $3B for AI, JADC2* DEFENSESCOOP (March 13, 2023), https://defensescoop.com/2023/03/13/pentagon-requesting-more-than-3b-for-ai-jadc2/.

[12] Ashwin, *supra* note 8.

[13] Aldo Spadoni, *How Technology From the Space Race Changed the World*, NORTHROP GRUMMAN (April 9, 2020), https://now.northropgrumman.com/how-technology-from-the-space-race-changed-the-world

[14] Daley, *supra* note 3.

[15] Ali Rogin & Harry Zahn, *How Militaries Are Using Artificial Intelligence On and Off the Battlefield*, PBS (July 9, 2023), https://www.pbs.org/newshour/show/how-militaries-are-using-artificial-intelligence-on-and-off-the-battlefield#:~:text=AI%20is%20being%20used%20to,enemy%20faster%20and%20more%20accurately.

[16] *Id.*

unwanted civilian targets.[17] I do not intend to weigh into the ethics of drone strikes, but am simply highlighting that the growing dependence on AI is believed to be heading towards the complete delegation of target recognition to AI, a change that could posit only further debate on the matter.[18]

As the concern for potential unethical use of AI in the military continues to grow, the Bureau of Arms Control, Verification and Compliance, an entity of the United States Department of State, released a "Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy."[19] This declaration is intended to be a framework utilized by agreeing countries to "build international consensus around how militaries can responsibly incorporate AI and autonomy into their operations."[20] While not legally binding, this declaration lists that member states should take steps to ensure military AI will comply with "their respective obligations under international law."[21]

The Space Race was a profound era in global history, yet relatively brief in the grand scheme of human existence. Many scholars consider it to have began with the launch of Sputnik in 1957 and ending with the walk on the moon by Neil Armstrong in 1969.[22] I highlight this to posit a question to the reader: how does the race for AI innovation end? Is there such a thing as a definitive ending? Is the answer complete autonomation, or somewhere prior? In reality, Pandora's box may simply be open and impossible to close as state and civilian motivations continue to drive it. In this way, the race to innovate in the world of artificial intelligence may be quite distinguishable from that of the Space Race. Regardless of the answers to these unanswerable questions, as seen by the desperate efforts around the world in countries like Germany to keep up with the powerhouse economies of the U.S. and China, the race is on!

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[17] Scott Shane, *Drone Strikes Reveal Uncomfortable Truth: U.S. Is Often Unsure About Who Will Die*, THE NEW YORK TIMES (April 23, 2015), https://www.nytimes.com/2015/04/24/world/asia/drone-strikes-reveal-uncomfortable-truth-us-is-often-unsure-about-who-will-die.html

[18] *Id*.

[19] *Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy*, U.S. DEPARTMENT OF STATE (February 16, 2023), https://www.state.gov/political-declaration-on-responsible-military-use-of-artificial-intelligence-and-autonomy/.

[20] *Building consensus on the U.S. Framework for a political declaration on the responsible military use of artificial intelligence and Autonomy*, U.S. DEPARTMENT OF STATE (February 16, 2023), https://www.state.gov/building-consensus-on-the-u-s-framework-for-a-political-declaration-on-the-responsible-military-use-of-artificial-intelligence-and-autonomy/.

[21] Political declaration on responsible military use of artificial intelligence and Autonomy, *supra* note 19.

[22] Michelle C Bradley, *Research Guides: Sputnik and the Space Race: 1957 and Yeyond: Introduction*, LIBRARY OF CONGRESS (Updated July 10, 2019), https://guides.loc.gov/sputnik-and-the-space-race; *Space Race Timeline*, ROYAL MUSEUMS GREENWICH, https://www.rmg.co.uk/stories/topics/space-race-timeline (last visited Sep 3, 2023).