Chinese Advantages
in the Development and Integration of Artificial Intelligence and Warfare

by Daniel G. Cox

The United States currently leads the world in Artificial Intelligence (AI) development. However, several scholars and writers have noted that this lead is dwindling and that China is rapidly catching up.[1] Most observers see a concerted effort by the Chinese government to coordinate giant leaps in AI technology for economic reasons. Some observers note that China is pushing the envelope in many cutting-edge technologies in order to improve resource production, lower the environmental costs of industrialization and manufacturing, and increase economic output. Recently, China has initiated a program to fund scientists to explore geoengineering in order to combat the costs of climate change.[2]

There is no doubt that economic considerations are one of the prime motivators of Chinese development of AI. Yet there is another reason China is keenly interested in developing AI and that is to achieve parity or superiority in warfare capabilities. China needs resources from outside of its homeland and it is beset on all sides by major American allies such as Japan, Taiwan, South Korea, Thailand, and even the Philippines despite the Duterte hiccup. Vietnam has also recently become more reliant on U.S. foreign military sales and has increased cooperation with the U.S. military.[3] These same countries are vying for the resource potential of the disputed South China Sea and the United States has long provided the sea projection power keeping the lanes of commerce open in this area. A recent World Trade Organization ruling against continued Chinese exploitation of the disputed sea off her coast has only heightened tension and increased the Chinese government's desire to project military power into what it perceives to be its rightful regional sphere of influence.[4] Therefore, the push into AI is not merely economic in nature but also necessary to China's military strategy of obtaining regional dominance.

While researchers have recognized China's concerted effort to become dominant in AI for economic reasons, no one has explored the possibility that China has distinct advantages over the United States in not only the development of AI but its utilization in warfare. American scholars and policymakers assume that democracy is all good, containing little to no disadvantages and they often have trouble seeing the potential advantages that centralized authoritarian regimes have in certain arenas. The main argument of this paper is that AI development is one of those unique

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opportunities where an advanced authoritarian regime possesses distinct advantages over an advanced democratic state. This paper identifies three areas that China can quickly exploit to overtake the United States in the near future gaining distinct economic and military advantages. The three broad areas that will be briefly explored here are: economic, cultural, and political.

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Chinese Economic Advantages in AI Development

China can take several notable actions in the economic arena that advanced democratic regimes cannot giving China some unique advantages in AI development. The economic realm contains some interesting ethical constraints that limit the number of options open to the United States in pursuit of AI development which do not constrain the Chinese government in the least. The most well-publicized of these economic concerns is intellectual property rights. China has repeatedly stolen intellectual property from the western world beginning with well-documented thefts of pharmaceutical and western entertainment intellectual property.[5] There is no reason to assume that the Chinese government will refrain from stealing western intellectual property relating to AI. Therefore, one quick avenue for catching up to the west is to simply steal AI algorithms and add to this base of coding until a new set of superior algorithms is developed. Since the United States government does not engage in the theft of intellectual property, the Chinese modifications will not flow back into the American system thus creating a distinct disadvantage for the United States in AI

development over time.

The Chinese could also derive an advantage from the centralized nature of their economy. The Chinese Central Communist Party (CCP) has liberalized their economy in an attempt to reap benefits from its advancing industrial and technological bases. However, China has not relinquished control over its economy and this allows the CCP to direct Chinese industry toward national purposes. The common thinking in the west is that such direction results in inefficiencies and will eventually sow the seeds of the centralized government's downfall in the long-term. There is some truth to this assertion borne out in the overdevelopment of Chinese commercial property resulting in multi-billion dollar cities that remain largely empty of inhabitants.[6] Still, if even for a narrow window of time, CCP direction and control of the economy could result in a short-term strategic advantage in the development of weaponized AI which results in a sufficient gap in the development of AI weapons prohibiting competitors from catching up.

China, unlike the United States, actually engages in an open integration of military and civilian enterprises. The People's Liberation Army (PLA) intends to leap ahead in AI weaponization and utilization in a national strategy known as "military-civil fusion."[7] This allows the Chinese military to leverage advances in AI development made by local companies such as Alibaba, Baidu, iCarbonx, Cloudminds, Sense Time, and others. Further, Chinese control of access to the domestic market allows them to essentially blackmail U.S. technology companies that wish to expand into the lucrative and growing Chinese markets. The U.S. government is currently investigating allegations that the Chinese government requires American companies to "turn over proprietary technological secrets as part of what American officials described as a coordinated effort to steal intellectual property."[8] China is especially

interested in obtaining AI algorithms and expertise from American countries in exchange for access. Companies such as Google seem more than willing to accommodate, arguing that science knows no borders as they open up an AI research laboratory in Beijing.[9]

America, on the other hand, is in almost the exact opposite situation with Apple being openly hostile to sharing AI developments with the U.S. Department of Defense and Google being lukewarm to partially hostile. In fact, thousands of Google workers recently protested their company when they found out that there was some collusion with the U.S. government in the development of AI algorithms. Google is providing AI support to the Pentagon's *Project Maven* which is an AI-assisted targeting system employed by the U.S. military. Over 3,100 Google employees signed a petition asking for Google to cease its work on the project and many signatories included senior engineers.[10] Such a protest or even the thought of keeping valuable AI information from becoming weaponized simply does not exist in China.

Eastern Cultural Advantages in the Development and Weaponization of AI

Western culture has a long tradition of war ethics stretching back to such greats as Hugo Grotius and St. Augustine. This western notion of international law seems dominant today as international legal conventions banning landmines or the use of indiscriminate means of war are in place currently. However, these conventions really only constrain western and especially American warfare. Because of the power dominance of the United States in the unipolar moment, China often rhetorically supports these legal conventions. In reality, neither China nor Russia feel constrained by international legal conventions even if they have signed and ratified them. Both China and Russia seem to be playing both sides when it comes to

international law. They refer to it when it suits their needs or when they feel it can be used to constrain the military power of the United States and the flout the law when they feel they can gain an advantage and plausibly deny encroachments of the law.

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This is only the tip of the iceberg when it comes to Chinese cultural advantages over the west in the development of weaponized AI. Unfortunately, AI has been depicted in western media as almost universally dangerous. The *Terminator* movies come readily to mind as modern examples of western scenarios of an AI apocalypse where a rogue AI decides to rid itself of humanity. The *Matrix* franchise is similarly themed but instead of genocide, the AI intelligence decides to use human-generated energy as a food source. An earlier depiction in Stanley Kubrick's *2001: A Space Odyssey* (1968) exposed westerners to the super intelligent computer "Hal," who attempts to commit homicide by failing to open the airlock for the astronaut "Dave." Hal became sentient and found Dave to be a threat to the computer intelligence's existence so Hal determined that Dave had to cease to exist. These are the repeated images that are mirrored in western science fiction books. It is hard to think of an example in western culture where AI is benevolent or anything less than menacing.

Japanese anime which permeates East Asian culture is replete with examples of AI transhumanism. *Ghost in the Shell*, *Ergo Proxy*, *Appleseed*, and *Metropolis* are all prominent examples of eastern cultural predispositions toward believing AI can possess virtuous

human characteristics. In *Ghost in the Shell* and *Appleseed* humans are melded with AI robotic bodies and become the crime-fighting heroes of their tales. In *Metropolis* AI synthetic creations become virtually indistinguishable from humans and while humans become unemployed and bitter romances occur between humans and sentient AIs. *Ergo Proxy* is the most akin to western warnings of runaway AI as sentient AI creatures are relegated to second-class citizens but rebel when they reach sentience. Even here, the AI rebellion is depicted empathetically rather than apocalyptically. Asian popular culture is more interested in exploring future possibilities and intersections, including friction points, between AIs and humans and in exploring what it means to be human in a world with mixed naturals and partially cyborg/AI entities rather than casting dire, apocalyptic warnings regarding AI.

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Popular culture which is almost universally anti-AI is mirrored by leading western thinkers' dire predictions regarding the development of AI and its weaponization. Innovator, inventor, and billionaire Elon Musk has repeatedly warned that AI could spell humanity's doom.[11] Late American physicist Steven Hawking also warned several times that AI was likely to bring on an apocalypse and the development of broad AI needed to be stopped.[12]

Similar calls to halt AI development are not present in China. In fact, from a Chinese cultural perspective, there is a widespread belief that AI can be imbued with the goodness of humanity. Chinese leaders tend not to view AI as replacing humans or even human jobs which is a huge concern in the west. Instead, China sees AI as beneficially making humans better.[13] Chinese

Confucian and communal culture, too, is more conducive to AI development and acceptance than the American individualist culture that emphasizes privacy, rights, and freedoms.

Chinese Governmental Advantages in Developing AI

The big switch came on in China when *AlphaGo* beat the best South Korean Go champions. This caused the Chinese military to envision a future where AI "could surpass the human mind and provide an advantage in warfare."[14] The Chinese government has taken a page from the U.S. playbook and developed their own science and technology branch within the PLA which looks like a Chinese version of the U.S. Defense Advanced Research Programs.[15] The Chinese government has a far greater capacity to integrate civilian and military enterprises. As Elsa Kania notes, "the boundaries between civilian and military research and development tend to become blurred, and the PLA is often closely associated with cutting-edge research on AI."[16]

America does have DARPA, but DARPA relies heavily on civilian businesses to produce the research that goes into weaponizing AI. While some companies are DoD friendly, as already illustrated, the leaders in AI development remain recalcitrant to working openly with the U.S. Department of Defense. Chinese civil-military fusion creates a seamlessness in an effort that can be directed and coordinated centrally through the CCP. This alone could provide China with an immense long-term advantage.

The Chinese government also has an immense data advantage. In order for AI to advance it has to engage in deep learning. Deep learning allows an AI algorithm to parse through immense data and make some determination and prediction about something in the world. Facial recognition comes readily to mind as one of the modern forms of deep learning. The AI learns from being fed immense data on faces and

determining which one belongs to whom. This has assisted the U.S. military in targeting through *Project Maven* and it is helping Homeland Security in determining identities at airport terminals. The problem is that in the United States and the much of the western world, there is an expectation that data about people should be kept as private as possible. Federal and state employees have to undergo rigorous training on the handling, dissemination, and destruction of Personally Identifiable Information (PII) and information on a U.S. citizen's health might as well be classified secret. The conundrum is that this is exactly the type of data that AI algorithms need to learn and the AI needs it in large quantities.

Recently, the U.S. company Facebook has been exposed for collecting all sorts of data on their online clients in an effort to advertise more effectively to them. Facebook has also been caught selling this PII data to third-party businesses.[17] The public outcry was immense and many Americans were shocked to find out the not only Facebook but Google and many other companies were collecting and, in some cases, selling their data. The point of all this is that it is unthinkable in America for the U.S. government to openly collect large amounts of data outside the U.S. Census on its citizens. In fact, it is illegal. The 4th Amendment of the U.S. Constitution states that "The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized." The U.S. Foreign Intelligence Surveillance Act allows the U.S. government to spy on foreign agents within the United States but specifically prohibits data collection on U.S. citizens without a warrant. In the western world, privacy is emphasized and infringement on this privacy by the government

will not be tolerated; and, even when companies legally collect data on their clients, it is often a public relations disaster once it is discovered.

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In China, the government has no restraints on the data it can collect. China's Google search engine equivalent, Baidu, collects massive amounts of data on its users but unlike in the United States, that data is directly shared with the government.[18] China accesses all forms of electronic communication tracking payments, shopping histories, movement through taxi services, and police surveillance, and China already has a natural advantage with over 750 million people online.[19] China has more people online and almost limitless access to their data which will allow China a significant deep learning advantage once they develop a deep learning algorithm that is even close to the current American standard. It is unlikely that western governments will allow such intrusive use of data which should raise alarm bells regarding the future of American dominance in AI.

The DJI UAV Case Example

A brief examination of the current controversy surrounding the commercially available Dà-Jiāng Innovations (DJI) unmanned aerial vehicle (UAV) will serve to synthesize some of the advantages the Chinese central government may possess over western democracies. Recently, the U.S. Army and Navy ordered its soldiers sailors to cease using DJI UAVs.[20] Soldiers often buy off-the-shelf technology, like DJI UAVs, in order to conduct surveillance in remote locations and when they are unable to use official surveillance support because there is no asset, the mission is time

sensitive, or it is conducted in an area or the situation is too politically sensitive within the host-nation for a large surveillance craft to operate. The U.S. Army did not specifically state its concerns publicly but both Services cited an unacceptable operational risk that the DJI UAVs presented.

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DJI UAVs have had a history of being hacked. But hacked mostly by users to break the flight height limit or by pranksters attempting to alter other security features. However, DJI video and audio does have the ability to be broadcast although DJI claims that such video is only disseminated when the user specifies its upload to the internet. DJI is a Chinese company which might also be raising concerns in the U.S. defense community.[21] Whatever the reason for the ban, the breach was deemed to be potentially severe enough that U.S. military operators are not allowed to use DJI UAVs under any circumstances.

Since we do not know the exact cause for concern, we can now enter into the hypothetical world and exemplify the Chinese advantages in this case. Since this is a Chinese company and since China engages in a civil-military fusion, the Chinese government could simply force DJI to turn on all its data feeds and feed that information back to the Chinese government. Besides the obvious potential intelligence this would bring to the Chinese government, if they applied AI to sifting through the mundane to find the militarily sensitive data, this could greatly expand the amount of data Chinese algorithms have access to for deep learning.

Now let us reverse this. Let us assume that only the American government knew of the DJI exploit and they could turn on the data feeds for all DJI UAVs. If the American government wanted to turn on all the feeds, it likely could not legally or culturally. Legally, this could be interpreted as unwarranted surveillance or spying on U.S. citizens since DJI UAVs are popular among the civilian populace in America. Culturally, such an invasion of privacy would spark a political backlash that would unlikely be worth the cost of the data gathered. America's algorithms will not be gaining access to DJI information any time soon, but China's could already have such access.

Conclusion

Currently, America is in a position of primacy in AI research and development that seems to be unassailable. However, many of the reasons this position of advantage seems unassailable may be built on faulty assumptions about Chinese culture, economics, and government. Naively assuming that China's economy is in dire straits due to its centralized nature clouds a person's ability to see the nimbleness that central governments can react and direct change in certain situations. Chinese civilian-military fusion which is anathema to western cultural conventions, Chinese Confucian ideology, the emphasis on the collective over the individual, and lack of privacy in data all lend to easier development of AI algorithms and deep learning techniques for their AI.

America's cultural predisposition and fear of the development of AI in general, a deep-seeded cultural distrust of government, and the fact that many of the prominent companies developing AI partially or wholly reject collusion with the military will all slow AI development in America. This is occurring at the same time that the Chinese government is coordinating a concerted effort to accelerate AI development and its weaponization. Finally, the almost

universal western fear of an AI *Terminator* run amok extinguishing all human life is contrasted by an East Asian mythology that has characterized the good that humans can imbue into their AI counterparts. Business pundits in the west warn of the jobs lost to AI while Chinese counterparts envision a future where human workers and human productivity is enhanced by AI. Blithely marching on believing that China cannot catch up or surpass the United States in AI development and failing to properly recognize some potential advantages China has in developing its own AI is the surest path to failure. ***IAJ***

NOTES

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