## AI CP

### 1NC---AI

#### CP Text: The United States government should increase funding for Artificial Intelligence research and education.

#### Funding and employment training solves the aff and avoids the wages DA

Will **Knight 18** – is MIT Technology Review’s Senior Editor for Artificial Intelligence. Cites Jason Furman, Professor at Harvard University's Kennedy School of Government. [“Here’s how the US needs to prepare for the age of artificial intelligence”, MIT Technology Review, April 6th,<https://www.technologyreview.com/s/610379/heres-how-the-us-needs-to-prepare-for-the-age-of-artificial-intelligence/>, AZ]

Invest more **Funding AI research** is the **biggest priority**, says Jason Furman, one of Obama’s top economic advisors and author of the 2016 AI report. Furman says basic research requires **government backing** and that advances made privately won’t benefit the country as a whole. Furman adds that it is especially important to promote AI because it could provide precisely the economic boost that leads to wage growth and new employment opportunities. “Economists have found, in general, that we may be spending about a quarter of what we should be, based on the returns,” he says. Oren Etzioni, CEO of the Allen Institute for Artificial Intelligence, a nonprofit based in Seattle, points out that core AI breakthroughs have their origins in academia. “If you don’t fund the universities, you run the risk of starving the goose that lays the golden egg,” he says. “We are at a momentous point in history.” Prepare for job losses But a government AI policy must go beyond calls for research funding. While AI can drive economic growth, it may also accelerate the eradication of some occupations, transform the nature of work in other jobs, and exacerbate economic inequality (see “The relentless pace of automation”). It is critical that governments prepare for this transformation. This might mean exploring ways to find training and employment opportunities for those who have lost **jobs to automation and AI**. Academic experts and institutions have been sounding the alarm over this issue and have warned that it might have serious social consequences. **Those problems will surely require government action**. “Planning for job displacement that AI will cause is best done by government,” says Andrew Ng, a prominent AI researcher who was previously the chief scientist at Baidu and is now involved with several different AI projects.

### 2NC---Overview

#### STEM education and research funding is essential

Alex **Hickey 18** – associate editor for the CIO Dive publication, University of Virginia. [“AI experts call for support of STEM education, research and open data policies at House hearing”, Ciodive, February 15th,<https://www.ciodive.com/news/ai-experts-call-for-support-of-stem-education-research-and-open-data-polic/517171/>, AZ]

The U.S. government is looking to integrate more AI capabilities across agencies. The next iteration of the FITARA scorecards will start asking federal CIOs what they are doing to introduce AI into their agencies, according to Rep. Will Hurd, R-TX, at a House Oversight and Government Reform committee hearing Wednesday. **A**rtificial **i**ntelligence experts from big tech and academia recommended that the **federal government promote** **STEM education** and **research funding**, open data access and ensure a light regulatory touch to amplify the track of the **nascent tech**nology and facilitate its adoption at the federal level. While AI has many applications for cybersecurity, there are also security concerns regarding the technology that need to be addressed. Not enough focus is being devoted to thinking about how adversaries might manipulate AI systems and how, once deployed, these systems will learn and change and that process might be influenced by an outside actor, said Dr. Charles Isbell, senior associate dean at Georgia Tech's College of Computing, at the panel. Machine learning and autonomous systems were prioritized as a budget issue for the first time in the White House's R&D memo, making the Trump administration the first to put dollars behind the technology, according to Michael Kratsios, deputy assistant to the president and deputy U.S. CTO, at a panel at the New Work Summit on Tuesday. Kratsios reiterated the need for better STEM education and a focus on regulatory hurdles. The **White House's budget** **allocated $84 billion to the DoD** **for R&D efforts**, with AI as a primary focus. But throwing money at the problem doesn't always work without **resources devoted to the basics.** Wednesday's hearing touched on many of the same themes brought up at a Senate hearing on AI in December, including caution against a heavy-handed regulatory approach, the problems of bias in AI systems and the need for diversity to counteract it, and the importance of STEM education and reinforcement at institutions of higher learning.

### 2NC---AT: Delay

#### No delay---there is still time to maintain US leadership

Ali **Breland 18** – Journalist for The Hill. [“Experts fear US losing ground to China on AI”, The Hill, February 14th,<http://thehill.com/policy/technology/373733-experts-fear-us-losing-ground-to-china-on-ai>, AZ]

U.S. technology companies, such as Google, Facebook and Apple, still lead foreign rivals in AI technology. But some observers say the **U.S. government has sat on the sidelines**. In November, recently retired Alphabet chairman Eric Schmidt said the federal government needs to “get its act together” on AI. Schmidt isn’t alone. In Washington, lawmakers say the **White House needs to step up its AI policy**. “We don’t have a national strategy. The people who should be leading the national strategy are the White House,” said Rep. John Delaney (D-Md.), co-chairman of the Congressional Artificial Intelligence Caucus. “China has a national strategy.” Technology companies also say they want to see more action from the federal government. “I don’t think federal agencies are investing in AI enough,” said Ian Buck, vice president of technology company NVIDIA’s accelerated computing business unit. “I would love to see the government invest more in **research funding** and proactively **evaluate the deployment of AI**.” The Trump White House has paid little attention publicly toward AI policy. Experts fear that, without action from the White House, the U.S. could lose technological ground to China. “China already has a meaningful track record — when it says it’s going to pursue something, then it makes it happen,” said Jack Clark, who oversees policy at Open AI, an artificial intelligence lab co-founded by Elon Musk. In July, China released a statement saying it would give serious attention to AI with the goal of becoming the world leader in AI by 2030. Even if China doesn’t overtake the U.S., though, experts in the American AI community think the U.S. could still lose a large chunk of global market share in terms of both AI development and talent to the Chinese. “The amount of rhetorical support you give AI is meaningful,” Clark said. “The market and talent for AI is global. These people are going to go to institutions in countries which are showing support for it.” While China’s play at AI dominance is still in its early stages, it’s already having an effect. Chinese research submissions to AI conferences have already ramped up significantly, while investment in Chinese AI work and patent filings are also on the rise. **U.S. AI experts** say **there is still time** for the federal government to back AI investments. “There’s a real risk of losing our edge on AI, but there is still **plenty** of **opportunity for** the U.S. government to act,” said Dean Garfield, president of the Information Technology Industry Council, a trade association that lobbies on behalf of tech giants. Garfield, who said he’s in regular contact with the White House’s Office of Science and Technology Policy, says the White House is working on artificial intelligence even if the administration doesn’t say much about it. “I don’t think that they’re talking about it enough, and they’re not outlining a clear strategy that would give people reason to be confident,” he said. “The critique I have is that they need to talk about it and share it more broadly, so that the private sector and academia can contribute as well.” Academics say they feel like AI research isn’t getting enough funding from the government. “[The **government] is not investing enough**. The amount that’s coming in is very small,” said Pedros Domingos, a professor at the University of Washington who specializes in machine learning. For its part, the White House rejects the premise that it’s not doing enough on AI. Instead, the administration says that it has a strategy in the works. “To maintain American leadership in artificial intelligence, the U.S. will continue to propel our nation’s [research and development] ecosystem,” Michael Kratsios, the head of the Office of Science and Technology Policy at the White House, said in a statement. Kratsios said the White House will prioritize **research funding** in academia “and work in partnership with the private sector” **to bolster U.S. innovation in AI**. The White House also pointed toward its continued funding of basic AI research across agencies, including the Defense Advanced Research Projects Agency, the Department of Defense and the National Institutes of Health. The administration also touted $200 million in Department of Education **funding toward improving STEM** — science, technology, engineering and math — education. But many in the AI industry and academia are puzzled by what they see as federal disinterest in AI. “If you look at the ‘America first’ priorities of the Trump administration, this should play very well with them,” Domingos said. “This is about making the U.S. competitive economically and militarily.”

#### Advantage sustainable---no time frame argument

Louise **Lucas and** Richard **Waters 18** – Lucas, covers tech for FT in Asia. Waters, FT’s west coast editor. [“China and US compete to dominate big data”, Financial Times, April 30th,<https://www.ft.com/content/e33a6994-447e-11e8-93cf-67ac3a6482fd>, AZ]

“We’ve seen more and more students choosing not to come to the US,” says Mr Etzioni. “We’re in the process of shooting ourselves in the head.” He points to one sign of how the talent pendulum is swinging away from the US: Google and Microsoft have both opened AI research centres in China to tap the AI workforce there. Yet the **expertise advantage** that the **US has will not disappear overnight**. **Companies like Yitu are moving** in the opposite direction because they believe the US west coast is still the magnet for many of the **world’s top engineering brains**. “Half the AI engineers in Silicon Valley are Chinese,” says Mr Wu.

### 2NC---AT: Top Talent

#### Top talent not key

Louise **Lucas and** Richard **Waters 18** – Lucas, covers tech for FT in Asia. Waters, FT’s west coast editor. [“China and US compete to dominate big data”, Financial Times, April 30th,<https://www.ft.com/content/e33a6994-447e-11e8-93cf-67ac3a6482fd>, AZ]

That view is echoed by some in China. “**For top talents**, clearly the US will still be the main resource. I think there’s **no question** of that,” says Rong Jin, head of machine intelligence technologies at DAMO Academy, Alibaba’s research programme. The perception in China is that Americans throw themselves into fundamental research and are heavy duty mathematicians — the disciplines at the heart of AI — while Chinese tend to study coding or engineering. **Yet despite those advantages**, China is rapidly narrowing the **algorithm gap**. When it comes to the output of China’s research institutions, “the statistics are definitely rising sharply”, says Oren Etzioni, who runs the AI research institute of Microsoft co-founder Paul Allen. He points to other signs of China’s growing AI capability, from the reading comprehension test earlier this year in which AI newcomer Alibaba tied for top honours with traditional research power Microsoft, to the strong showing of Chinese researchers in the annual ImageNet competition for image recognition. On the second category of hardware development, China has been slower to build the sort of homegrown chip industry needed to put it on the leading edge. That has been partly due to a series of decisions that effectively bar the acquisition of US chip companies, which started under the Obama administration and accelerated under President Donald Trump. It is in the final area — the availability of raw data — where most experts believe China’s AI advantage lies.

### 2NC---Education Key

#### Nurturing new talent is important---their own evidence agrees.

Andy **1AC** **Chun 18**, [Andy Chun- associate professor at City University of Hong Kong and convenor of the AI Specialist Group at Hong Kong Computer Society. "China’s AI dream is well on its way to becoming a reality", South China Morning Post, 22 April 2018,<https://www.scmp.com/comment/insight-opinion/article/2142641/chinas-ai-dream-well-its-way-becoming-reality>, AZ] Valiaveedu

**Nurturing new talent** **is just as** **important as attracting existing talent,** and the **Chinese government realises this**. **China’s AI road map calls for increased education in coding and AI at the primary- and middle-school levels**. This will mean children in China will be learning coding earlier than in other countries. In addition, this month, the Ministry of Education launched a five-year AI talent training programme, under which at least 500 teachers and 5,000 students will be trained at top universities. At the same time, the ministry released a comprehensive “AI Innovation Action Plan for Colleges and Universities” to cultivate **talent in support of China’s 2030 AI goals**. The plan calls for new AI teaching and research facilities as well as new courses, both offline and online, and the creation of 100 “AI+X” cross-disciplinary studies.

#### Lack of students hampers AI development

Darrell M. **West and** John R. **Allen** – West, Vice President and Director - Governance Studies Founding Director - Center for Technology Innovation at the Brookings Institution. Allen, President - The Brookings Institution. [“How artificial intelligence is transforming the world”, The Brookings Institution, April 24th,<https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/>, AZ]

Promote digital education and workforce development As AI applications accelerate across many sectors, it is vital that we reimagine our educational institutions for a world where AI will be ubiquitous and students need a different kind of training than they currently receive. Right now, many students do not receive instruction in the kinds of skills that will be needed in an **AI-dominated landscape**. For example, there currently are shortages of data scientists, computer scientists, engineers, coders, and platform developers. These are skills that are in short supply; **unless** our educational system **generates more people** with these capabilities, **it will limit AI development**. For these reasons, both state and federal governments have been investing in AI human capital. For example, in 2017, the National Science Foundation funded over 6,500 graduate students in computer-related fields and has launched several new initiatives designed to encourage data and computer science at all levels from pre-K to higher and continuing education.[57] The goal is to build a **larger pipeline of AI** and **data analytic personnel** so that the United States can reap the full advantages of the knowledge revolution. But there also needs to be substantial changes in the process of learning itself. It is not just technical skills that are needed in an AI world but skills of critical reasoning, collaboration, design, visual display of information, and independent thinking, among others. AI will reconfigure how society and the economy operate, and there needs to be “big picture” thinking on what this will mean for ethics, governance, and societal impact. People will need the ability to think broadly about many questions and integrate knowledge from a number of different areas. One example of new ways to prepare students for a digital future is IBM’s Teacher Advisor program, utilizing Watson’s free online tools to help teachers bring the latest knowledge into the classroom. They enable instructors to develop new lesson plans in STEM and non-STEM fields, find relevant instructional videos, and help students get the most out of the classroom.[58] As such, they are precursors of **new educational environments** that **need to be created**.

#### Education solves the status quo talent crisis

Will **Knight 18** – is MIT Technology Review’s Senior Editor for Artificial Intelligence. Cites Tess Posner, CEO at AI4ALL, University of Columbia. [“Here’s how the US needs to prepare for the age of artificial intelligence”, MIT Technology Review, April 6th,<https://www.technologyreview.com/s/610379/heres-how-the-us-needs-to-prepare-for-the-age-of-artificial-intelligence/>, AZ]

Prioritize education **Education should be a key part** of the picture. New AI scientists will fuel the industry, but broader AI expertise across different industries is also **an important goal**. Tess Posner, who leads the nonprofit AI4All, says beyond boosting the industry, **education can** help **address the** its **shortcomings**. “There is not only a **talent crisis in AI**; there is a diversity crisis, and that is problematic,” she says. Posner suggests that the government should not be responsible for educating AI experts, but it should be at the **forefront of the effort**. “It’s such an important tech that there **should be a national focus on it**,” she says. Again, other countries are stealing a march here. The UK has, for example, launched new university courses focused on AI and added funding for doctoral students at top universities.

#### Educational talent needed

Elsa B. **1AC** **Kania 17**, [Elsa B. Kania- Adjunct Fellow with the Technology and National Security Program at the Center for a New American Security "Artificial Intelligence and Chinese Power", Foreign Affairs, 12-5-2017, https://www.foreignaffairs.com/articles/china/2017-12-05/artificial-intelligence-and-chinese-power] Valiaveedu

**The trajectory of China’s advances in AI remains to be seen**. But in light of the progress that the PLA has already achieved, **the U.S. military should recognize that China is quickly becoming a peer competitor** in AI—and adjust its own plans accordingly. U.S. defense officials should carefully study the PLA’s advances in the field in the context of China’s broader strategic goals. At the same time, Washington should preserve the underlying advantages that will shape its competitiveness in the future. First, the U.S. government should invest far more in long-term research on AI and its applications. The Trump administration’s initial budget proposal called for a ten percent cut to the National Science Foundation’s funding for research on intelligent systems, to a mere $175 million. China, by contrast, will spend billions in the years to come on next-generation AI research. Second, **Washington should make sure to preserve its edge in human capital. (The United States is now home to more AI experts than any other country.) That will require doing more to attract the world’s top AI talent to work in the United States** and **developing** the educational programming in high schools and universities **needed to create future professionals in the field.** And the U.S. government should work to prevent illicit technology transfers by, for example, increasing its oversight of Chinese investments and acquisitions in sensitive sectors of the American economy, including AI and robotics, even as it takes care that it does not generally discourage foreign investment, which can support innovation. The U.S. military must recognize the challenge of China’s emergence as a would-be AI superpower—and prepare for a future in which the United States’ technological advantage is no longer assured.

### 2NC---Funding Key

#### Only the counterplan solves research and AI development---this is a solvency deficit to the affirmative because even if more immigrants come, AI development will still be flat because of the lack of government support

Vikram **1AC Barhat 18**, [Vikram Barhat- Toronto-based financial writer specializing in investing, personal finance and other areas of the financial services industry, "China is determined to steal the A.I. crown from US, and not even a trade war will stop it", CNBC, 4-4-2018,<https://www.cnbc.com/2018/05/04/china-aims-to-steal-us-a-i-crown-and-not-even-trade-war-will-stop-it.html>, AZ] Valiaveedu

US research sector could struggle

By contrast, the U.S. research sector could be struggling for **funding and policy support** under the Trump administration. The American Association for the Advancement of Science said the White House planned to slash science and technology research funding by 15 percent in 2018. Worse, with the recent immigration clampdown, the United States may soon be struggling to attract and retain highly skilled tech experts from around the world that it needs to keep Silicon Valley at the cutting edge of A.I. research and innovation.

There are indications America's grasp of A.I. primacy may already be slipping. According to the White House's National Artificial Intelligence Research and Development Strategic Plan in A.I. research, China had already surpassed the United States, at least in terms of journal articles that mention "deep learning" or "deep neural network," as far back as 2016.

"Sadly, when it comes to science and innovation, the **U.S. is moving in reverse** by cutting funding for research, denying climate change and **cutting investments in education**," said Vivek Wadhwa, a distinguished fellow and adjunct professor at Carnegie Mellon University's College of Engineering and author of The Driver in the Driverless Car: How Our Technology Choices Will Create the Future.

U.S. leaders do not appear to be aware of A.I. developments, said Joshua Gans, business professor at the University of Toronto and co-author of Prediction Machines: The Simple Economics of Artificial Intelligence. "President Obama discussed it [AI] on numerous occasions," he said. "[Research funding cuts] is obviously bad news in terms of its ability to nurture scientific leadership. It is shortsighted and will harm the U.S. in the medium-long term."

#### Funding solves---China strategy proves

Michael **1AC** **Spencer 18** [Michael K. Spencer – Content consultant for #blockchain startups. LinkedIn Futurist and Medium Tech journalist. Cites Oxford University study and MIT Technology Review, “China is Projected to Catch and Pass the U.S. in AI” Medium, March 21, 2018,<https://medium.com/@Michael_Spencer/china-is-projected-to-catch-and-pass-the-u-s-in-ai-74ae1a9b24d>, AZ] Valiaveedu

According to Futurism, the United States’ current levels of R&D spending on AI are one-half to one-quarter of the levels that would be best for economic growth. **China on the other hand, have made becoming a leader in AI, one of the state’s primary goals to illustrate the advent of New China.** This is where the facts become scary. China’s **one-party rule** affords them an incredible ability to **“get shit done**.” I don’t suspect developing AI will be a major issue for them, as having a higher population here becomes an essential advantage. **More collaboration and a bigger slices of funding and Big Data, will win this war**. The wheels of Chinese supremacy in AI have been set in motion.

# CASE

## No Talent Shortage

### 1NC---No Talent Shortage

#### Talent is not key---US has far more talent than China yet still lags in number of patents

Iris **Deng 18** – Hong Kong-based technology reporter. [“China’s AI industry gets the most funding, but lags the US in key talent, says Tsinghua”, South China Morning Post, July 17th,<https://www.scmp.com/tech/china-tech/article/2155600/chinas-ai-industry-gets-most-funding-lags-us-key-talent-says>, AZ]

China’s artificial intelligence industry has attracted the most funding, **accounting for 60 per cent of all global investment** from 2013 to the first quarter of 2018, but **still lags** **behind the US in terms of AI talent**, according to a new study. By the end of 2017 China had amassed an AI talent pool of 18,232 people, accounting for 8.9 per cent of the world’s total talent and **well behind** the **13.9 per cent share held by the US**. The top 10 countries accounted for 60 per cent of AI talent. The report also stressed the country’s shortage of high level AI talent – those who produce research of high quality – with China only having one fifth the number of the US in this category, according to a report released Friday by Tsinghua University, China’s top research university. In terms of AI research, **China ranks first** in the **quantity and citation of research papers**, and **holds the most AI patents**, edging out the US and Japan, the report shows.

### 2NC---No Talent Shortage

#### Talent gap is wide---funding has a more significant effect on AI competitiveness.

Kaveh **Waddell 18** – AI reporter at Axios. [“Report: China leads U.S. on AI funding but trails on talent”, Axios, July 17th,<https://www.axios.com/china-artificial-funding-talent-jobs-ai-55c2d97c-3748-4ea7-9e87-1f4b3f242076.html>, AZ]

Two-thirds of global AI investment today goes to China, ballooning the value of China’s AI market by 67% from 2016 to 2017 and **threatening** to rob the U.S. of its **tenuous AI lead**, according to a new study from China’s Tsinghua University. Why it matters: The U.S. and China are jockeying to be an AI superpower, as private investors and governments pour money into research in both countries. The **U.S. has a serious talent edge over China** for now, **but China’s funding advantage keeps it in the running**, as top universities like Tsinghua turn out high-quality researchers. Show less The big picture: The U.S. still has a solid talent advantage. According to the study, which was reported on in the South China Morning Post: **China’s AI talent pool made up just under 9%** of the global total, compared to nearly the 14% of AI talent that’s in the U.S. When it comes to **high-level talent** — the best of the best — the **gap is even wider**: China has **one-fifth** the top talent that the U.S. has. The U.S. and Japan trail China in number of AI patents, and **China leads** in the quantity of research papers produced and the number of times they’re cited.

#### Trump is cutting AI funding---

Paul **Mozur and** John **Markoff 17** – Mozur, technology report for the NYT in Hong Kong. Markoff, technology reporter for the NYT. [“Is China Outsmarting America in A.I.?”, The New York Times, May 27th,<https://www.nytimes.com/2017/05/27/technology/china-us-ai-artificial-intelligence.html>, AZ]

Beijing is backing its artificial intelligence push with vast sums of money. Having already spent billions on research programs, China is readying a new multibillion-dollar initiative to fund moonshot projects, start-ups and academic research, all with the aim of growing China’s A.I. capabilities, according to two professors who consulted with the government on the plan. China’s private companies are pushing deeply into the field as well, though the line between government and private in China sometimes blurs. Baidu — often called the Google of China and a pioneer in artificial-intelligence-related fields, like speech recognition — this year opened a joint company-government laboratory partly run by academics who once worked on research into Chinese military robots. **China is spending more** just as the United States **cuts back**. This past week, the Trump administration released a proposed budget that would slash funding for a variety of government agencies that have traditionally backed artificial intelligence research. “It’s a race in the new generation of computing,” said James Lewis, a senior fellow at the Center for Strategic and International Studies. “The difference is that **China seems to think it’s a race** and **America doesn’t**.” For Mr. Schwertfeger, the **money mattered**. He received a grant six times larger than what he might have gotten in Europe or America. That enabled him to set up a full artificial intelligence lab, with an assistant, a technician and a group of Ph.D. students. “It’s almost impossible for assistant professors to get this much money,” he said. “The research funding is shrinking in the **U.S.** and Europe. But it is definitely expanding in China.” Mr. Schwertfeger’s lab, which is part of ShanghaiTech University, works on ways for machines, without any aid from humans, to avoid obstacles. Decked out with wheeled robots, drones and sensors, the lab works on ways for computers to make their own maps and to improve the performance of robots with tasks like finding objects — specifically, people — during search-and-rescue operations. Much of China’s artificial intelligence push is similarly **peaceful**. Still, its prowess and dedication have set off alarms within the United States’ defense establishment. The Defense Department found that **Chinese money has been pouring into American a**rtificial **i**ntelligence **companies** — some of the same ones it had been looking to for future weapons systems. Quantifying China’s spending push is difficult, because authorities there disclose little. But experts say it looks to be considerable. Numerous provinces and cities are spending billions on developing robotics, and a part of that funding is likely to go to artificial intelligence research. For example, the relatively unknown city of Xiangtan, in China’s Hunan province, has pledged $2 billion toward developing robots and artificial intelligence. Other places have direct incentives for the A.I. industry. In Suzhou, leading artificial intelligence companies can get about $800,000 in subsidies for setting up shop locally, while Shenzhen, in southern China, is offering $1 million to support any A.I. project established there. On a national level, China is working on a system to predict events like terrorist attacks or labor strikes based on possible precursors like labor strife. A paper funded by the National Natural Science Foundation of China showed how facial recognition software can be simplified so that it can be more easily integrated with cameras across the country. China is preparing a concerted nationwide push, according to the two professors who advised on the effort but declined to be identified, because the effort has not yet been made public. While the size wasn’t clear, they said, it would most likely result in billions of dollars in spending. President Trump’s proposed budget, meanwhile, would reduce the National Science Foundation’s spending on so-called intelligent systems by 10 percent, to about $175 million. Research and development in other areas would also be cut, though the proposed budget does call for more spending on defense research and some supercomputing. The cuts would essentially shift more research and development to **private American companies like Google and Facebook.** “The previous administration was preparing for a future with artificial intelligence,” said Subbarao Kambhampati, president of the Association for the Advancement of Artificial intelligence. “They were talking about increasing basic research for artificial intelligence. Instead of increases, we are now being significantly affected.”

### 1NC---No SCS Impact

#### No US-China war or miscalculation over the SCS

Timothy **Heath and** William R. **Thompson 17** – is a senior international defense research analyst at the nonprofit, nonpartisan RAND Corporation and member of the Pardee RAND Graduate School faculty. William R. Thompson is Distinguished and Rogers Professor at Indiana University and an adjunct researcher at RAND. [“U.S.-China Tensions Are Unlikely to Lead to War”, The National Interest, April 30th,<https://nationalinterest.org/feature/us-china-tensions-are-unlikely-lead-war-20411>, AZ]

Graham Allison's April 12 article, “ How America and China Could Stumble to War ,” explores how misperceptions and bureaucratic dysfunction could accelerate a militarized crisis involving the United States and China into an unwanted war. However, the article fails to persuade because it neglects the key political and geostrategic conditions that make war plausible in the first place. Without those conditions in place, the risk that a crisis could accidentally escalate into war becomes far lower. The U.S.-China relationship today **may be trending towards greater tension**, but the **relative stability and overall low level of hostility** make the prospect of an accidental escalation to war **extremely unlikely**. In a series of scenarios centered around the South China Sea, Taiwan and the East China Sea, Allison explored how well-established flashpoints involving China and the United States and its allies could spiral into unwanted war. Allison’s article argues that given the context of strategic rivalry between a rising power and a status-quo power, organizational and bureaucratic misjudgments increase the likelihood of unintended escalation. According to Allison, “the underlying stress created by China’s disruptive rise creates conditions in which accidental, otherwise inconsequential events could trigger a large-scale conflict.” This argument appears persuasive on its surface, in no small part because it evokes insights from some of Allison’s groundbreaking work on the organizational pathologies that made the Cuban Missile Crisis so dangerous. However, Allison ultimately fails to persuade because he fails to specify the political and strategic conditions that make war plausible in the first place. Allison’s analysis implies that the United States and China are in a situation analogous to that of the Soviet Union and the United States in the early 1960s. In the Cold War example, the two countries faced each other on a near-war footing and engaged in a bitter geostrategic and ideological struggle for supremacy. The two countries experienced a series of militarized crises and fought each other repeatedly through proxy wars. It was this broader context that made issues of misjudgment so dangerous in a crisis. By contrast, the U.S.-China relationship today operates **at a much lower level of hostility and threat**. China and the United States may be experiencing an increase in tensions, but the two countries remain far from the bitter, acrimonious rivalry that defined the U.S.-Soviet relationship in the early 1960s. Neither Washington nor Beijing regards the other as its principal enemy. Today’s rivals may view each other warily as competitors and threats on some issues, but they also view each other as important trade partners and partners on some shared concerns, such as North Korea, as the recent summit between President Donald Trump and Chinese president Xi Jinping illustrated. The behavior of their respective militaries underscores the relatively restrained rivalry. The military competition between China and the United States may be growing, **but it operates at a far lower level of intensity** than the relentless arms racing that typified the U.S.-Soviet standoff. And unlike their Cold War counterparts, U.S. and Chinese militaries are not postured to fight each other in major wars. Moreover, polls show that the people of the two countries regard each other with mixed views —a considerable contrast from the hostile sentiment expressed by the U.S. and Soviet publics for each other. Lacking both preparations for major war and a constituency for conflict, leaders and bureaucracies in both countries have less incentive to misjudge crisis situations in favor of unwarranted escalation. To the contrary, political leaders and bureaucracies currently face a strong incentive to find ways of defusing crises in a manner **that avoids unwanted escalation**. This inclination manifested itself in the EP-3 airplane collision off Hainan Island in 2001, and in subsequent incidents involving U.S. and Chinese ships and aircraft, such as the harassment of the USNS Impeccable in 2009. This does not mean that there is no risk, however. Indeed, the potential for a dangerous militarized crisis may be growing. Moreover, key political and geostrategic developments could shift the incentives for leaders in favor of more escalatory options in a crisis and thereby make Allison’s scenarios more plausible. Past precedents offer some insight into the types of developments that would most likely propel the U.S.-China relationship into a hostile, competitive one featuring an elevated risk of conflict. The most important driver, as Allison recognizes, would be a growing parity between China and the United States as economic, technological and geostrategic leaders of the international system. The United States and China feature an increasing parity in the size of their economies, but the **U**nited **S**tates **retains a considerable lead** in virtually every other dimension of national power. The current U.S.-China rivalry is a regional one centered on the Asia-Pacific region, but it retains the considerable potential of escalating into a global, systemic competition down the road. A second important driver would be the mobilization of public opinion behind the view that the other country is a primary source of threat, thereby providing a stronger constituency for escalatory policies. A related development would be the formal designation by leaders in both capitals of the other country as a primary hostile threat and likely foe. These developments would most likely be fueled by a growing array of intractable disputes, and further accelerated by a serious militarized crisis. The cumulative effect would be the exacerbation of an antagonistic competitive rivalry, repeated and volatile militarized crisis, and heightened risk that any flashpoint could escalate rapidly to war—a relationship that would resemble the U.S.-Soviet relationship in the early 1960s. Yet even if the relationship evolved towards a more hostile form of rivalry, unique features of the contemporary world suggest lessons drawn from the past may have limited applicability. **Economic interdependence** in the twenty-first century **is much different and far more complex** than in it was in the past. So is the **lethality of weaponry available to the major powers**. In the sixteenth century, armies fought with pikes, swords and primitive guns. In the twenty-first century, it is possible to eliminate all life on the planet in a full-bore nuclear exchange. These features likely affect the willingness of leaders to escalate in a crisis in a manner far differently than in past rivalries. More broadly, Allison’s analysis about the “**Thucydides Trap”** may be criticized for **exaggerating the risks of war**. In his claims to identify a high propensity for war between “rising” and “ruling” countries, he fails to clarify those terms, and does not distinguish the more dangerous from the less volatile types of rivalries. Contests for supremacy over land regions, for example, have historically proven the most conflict-prone, while competition for supremacy **over maritime regions has**, by contrast, **tended to be less lethal**. Rivalries also wax and wane over time, with varying levels of risks of war. A more careful review of rivalries and their variety, duration and patterns of interaction suggests that although most wars involve rivalries, many rivals avoid going to war . Misperceptions and strategic accidents remain a persistent feature of international politics, and it may well be that that mistakes are more likely to be lethal in periods of adjustment in relative power configurations. Rising states do have problems negotiating status quo changes with states that have staked out their predominance earlier. Even so, the probability of war between China and the United States is almost certainly far less than the 75 percent predicted by Allison. If the leaders of both countries can continue to find ways to dampen the trends towards hostile rivalry and maintain sufficient cooperation to manage differences, then there is good reason to hope that the risk of war can be lowered further still.

#### China already has military superiority in the SCS

Ian **Bowers 17** {Norwegian Institute for Defence Studies, Centre for Asian Security Studies, PhD in War Studies from King's College London. Bowers' dissertation was a multi-faceted study of the modernisation of the Republic of Korea Navy. His current research and teaching interests include East Asian security, naval strategy and procurement. December 2017. “Power Asymmetry and the Role of Deterrence in the South China Sea.” https://brage.bibsys.no/xmlui/bitstream/handle/11250/2483521/Bowers%2B2017.pdf?sequence=1}//JM

Although, the weaker powers of the SCS may attempt to enact a deterrence by denial strategy, China’s sheer power advantage calls into question the credibility of any such deterrent strategy. However, in the strategic maritime environment of the SCS where the nature of the conflict is, as described above, limited, coercive and non-existential, power asymmetry can be mitigated during everyday operations. Credibility is at the heart of deterrence; an aggressor must be convinced that an opponent is capable and willing to carry out a deterrent strategy.25 Mearsheimer, in addressing conventional deterrence on land writes that “where asymmetry is so great that the attacker does not have the slightest doubt that he will succeed on the battlefield...the concept of conventional deterrence does not apply.”26 The power differential suggests that at sea such a premise may also ring true and that the littoral nations of the SCS cannot credibly deter China’s actions in the region. However, China’s maritime geostrategic position and the nature of operations at sea serve to partially offset its numerical superiority in everyday operations. This is relevant, as in cases of deterrence, it is not the ratio of total capabilities but the “immediate and short–term balance of forces” in proximity to the target that has the most impact on deterrence calculations.27 As the UK discovered during the Falkland invasion, despite the possession of nuclear weapons and a relatively powerful military capability in Europe, if there are no forces to credibly impose cost at the point of attack, deterrence is more likely to fail.28 That China possesses a vast superiority in terms of naval and civilian platforms is not in doubt. Table 1 demonstrates China’s significant numerical advantage in terms of deployable naval platforms, while Table 2 highlights the scope of Beijing’s policy to bolster the capacities of its maritime law enforcement agencies to the disadvantage of the other claimant states. Further, China also uses a state–supported civilian maritime militia operating from its massive fishing fleet to further increase its presence in the region.29 China’s superior production capacity ensures that it is almost certain to maintain its advantage in ships. Between 2016 and 2017, China added 15 1500+ ton vessels and over 100 vessels between 250 and 1500 tons to its maritime law enforcement agency fleets while in the same period the nations of the SCS added on three vessels over 1500 tons.30

### 2NC---No SCS Impact

#### Deterrence Solves

Ian **Bowers 17** {Norwegian Institute for Defence Studies, Centre for Asian Security Studies, PhD in War Studies from King's College London. Bowers' dissertation was a multi-faceted study of the modernisation of the Republic of Korea Navy. His current research and teaching interests include East Asian security, naval strategy and procurement. December 2017. “Power Asymmetry and the Role of Deterrence in the South China Sea.” https://brage.bibsys.no/xmlui/bitstream/handle/11250/2483521/Bowers%2B2017.pdf?sequence=1}//JM

As maritime strategic geography shapes the nature of China’s operations in the SCS, it equally plays a role in determining the efficacy of conventional deterrence strategies designed to meet these threats. Deterrence is a strategy designed to prevent one party from performing an unwanted action by reducing the benefits or heightening the potential costs of said action.11 In a paradigm where there is power parity, or the deterring party has superiority, a naval force will ideally develop a deterrence strategy which contains elements of both punishment and denial.12 This is the standard assumption on which naval analysts espouse the unique capacity of seapower to implement conventional deterrence.13 The forward-deployed and based U.S. Navy is the most powerful naval force in the world and thus has the capacity to employ both elements. It maintains assets which can “impose unacceptable consequences on an aggressor” and “deny an adversary the physical or psychological benefits of its aggression.”14 However, in a maritime theater such as the SCS where the weaker side is the deterring party, the power imbalance limits the available deterrent options. Deterrence by punishment functions on the threat of retaliation if an opponent undertakes aggressive action.15 It is the fear of these costs which deters unwanted action. The ability to operationalize deterrence by punishment is dependent on the possession of credible capabilities sufficient to hurt an aggressor.16 Under conditions of power asymmetry, punitive conventional naval capabilities that could sufficiently punish a larger power are beyond the capacity of smaller navies. The pursuit of such an approach is not only inefficient but is inherently risky under conditions of power asymmetry as it could provoke the larger power into pre-emptive action. Consequently, a weaker navy’s preferred deterrence option is deterrence by denial. Deterrence by denial concentrates on the prevention of an aggressor meeting its immediate goals.17 This is enacted by “convincing an adversary that it cannot achieve its objectives rapidly or convincingly” thereby preventing a fait accomplis and reducing the benefits of aggression.18 Naval forces can be deployed to increase the uncertainties and heighten the potential costs to an aggressor even if said military forces could not mount an effective defense.19 In this case a deterrent capacity may be demonstrated in actual operations, when deterrence initially fails but the defensive act, even if unsuccessful, imposes sufficient costs to deter repeat occurrences or further action.20 Despite their relative weakness, smaller navies can impose a denial strategy as described above. Small navies are strategically and operationally relevant when pitted against a more powerful opponent.21 This is particularly true in littoral waters where navies can leverage geography and technology to punch above their weight and impose substantial cost on an attacking force.22 Under such conditions, victory in battle does not have to be the primary objective; instead the smaller force can maintain capabilities which can alter an opponent’s perception regarding the advantages of aggression.23 Therefore, the smaller naval force can make aggression prohibitively costly at an operational level or can prolong a conflict in the hope of garnering international assistance or sympathy, thereby raising the cost on a political level.24

## Addons

### 1NC---AT: Cyber

#### Data is the only barrier to AI cybersecurity applications.

Elise **Poirier 18** {Administrative assistant at Benhamou Global Ventures, and former Operations Specialist at Baidu USA. 3-27-2018. “Applying AI to Cybersecurity – Separating Hype from Reality (Part 1).” http://benhamouglobalventures.com/2018/03/27/applying-ai-cybersecurity-separating-hype-reality-part-1/}//JM

For CISOs investing in security products marketed as “AI-driven”, it is critical to deconstruct the hype through several key lenses of reality: Contextual Data is King – Cybersecurity challenges are broadly design and data problems, rather than machine learning problems. While startups may differentiate on the sophistication of their algorithms, the data itself is an important source of differentiation. The nature of constantly evolving cyber threats dramatically increases the need for real-time intelligence flow to power ML algorithms, rather than second-hand data sets. Furthermore, as it becomes harder to detect the signal among the noise of massive data sets, solutions require that these data sets be labeled to train ML algorithms – requiring efficient processes and manpower. Successful startups typically fall into specific categories: Companies with an area of a high availability of labeled samples for supervising learning data, such as Cybereason, Cylance etc. which have successfully reduced false positives and false negatives in malware identification and spam detection. Companies assembling very large, unique data sets by scanning the deep web and underground forums. 4iQ (4iQ.com), a BGV portfolio company, has built one of the largest identity threat intelligence data lakes with 13 billion breach records detected. CEO Monica Pal notes that “When it comes to the deep web, depending on what you are doing, you have to know who to talk to and where to look. When it comes to breached data, you need people with deep knowledge of the breach economy and where the activity is.” Applying ML to this data lake enables a company to more quickly cleanse, validate and ingest the data, and then send alerts to affected consumers. Both applications highlight the need for new ML techniques to optimize data efficiency. Summary Analytics, another BGV portfolio company, uses sub-modular functions to optimally identify representative subsets of larger data sets, thereby significantly accelerating machine learning. Variation is Native to Security – In a landscape of rapidly evolving threats, trying to detect and defend against a moving target is difficult with no predictable progression of threats. In fact, ML-based solutions are likely to have more false positives and false negatives when large variations are pervasive throughout the underlying data set (e.g. when polymorphism makes every attack using same underlying malware look different) and when the data set cannot be deterministically labeled, cannot be easily cleaned, or is too small. A low threshold for false positives is often intentional; the risk of a single false negative is so probative that most solutions are tuned to prefer more false positives. We expect startups to make advances in automation to help security professionals work through the false positives more efficiently.

#### And we’re way behind.

**Lucas and Waters 5/1** (Louise and Richard. “The AI arms race: China and US compete to dominate big data”, 5/1/18. https://www.ft.com/content/e33a6994-447e-11e8-93cf-67ac3a6482fd, 7/10/18)//JM

It is in the final area — the availability of raw data — where most experts believe China’s AI advantage lies. China has reams of data on its citizens and is not afraidto use it. This is partly due to a state that monitors everything from birth: facial recognition is so widespread you can be picked up for jaywalking and stopped from stealing tissue at the Temple of Heaven in Beijing. But it is also a tribute to China’s early move online: this is a country where people order, shop, pay and play online, leaving massive data footprints that enable merchants to accurately target ads and promotions. “The density of people is proportional to the density of data,” says a leading Chinese machine intelligence scientist. Chinese attitudes to data privacy are becoming slightly less lax, but regulations are still a million miles from Europe, which is at the other end of the spectrum and will introduce tough privacy rules later this month known as General Data Protection Regulation. Yet American companies like Facebook, Google and Amazon also have masses of data, says Mr Wu at Yitu. That suggests that general-purpose AI applications like facial recognition will be the preserve of all “the big platforms”, regardless of their country of origin, says James Manyika, a partner at McKinsey. By contrast, more specialised applications could be perfected where the data are the richest. When it comes to manufacturing, for instance, China is “collecting a lot more data”, he says. This data advantage could be greatest in fields where regulation has made access to information harder, or prevented it being collected in the first place, according to some experts. Earlier this year, Google published promising research suggesting it could predict the risk of heart attack by using image-recognition software to study retinal blood vessels. The research relied heavily on UK Biobank, a database drawing on a detailed study of volunteers in Britain beginning in 2006. Yet only 631 people in the Biobank had medical conditions relevant to the research. That made the data set “relatively small for deep learning”, Google said, reducing the effectiveness of the algorithm it was able to train on the information. Chinese medical AI researchers, by contrast, have been able to tap into far bigger data sets, according to one expert.

#### No impact to even the worst cyber-attacks, and no nuclear retaliation.

Patrick **Tucker 18** {Patrick Tucker is technology editor for Defense One. He’s also the author of The Naked Future: What Happens in a World That Anticipates Your Every Move? (Current, 2014). Previously, Tucker was deputy editor for The Futurist for nine years. 2-2-2018. “No, the US Won’t Respond to A Cyber Attack with Nukes.” https://www.defenseone.com/technology/2018/02/no-us-wont-respond-cyber-attack-nukes/145700/}//JM

The idea that the U.S. is building new low-yield nuclear weapons to respond to a cyber attack is “not true,” military leaders told reporters in the runup to the Friday release of the new Nuclear Posture Review. “The people who say we lowered the threshold for the use of nuclear weapons are saying, ‘but we want these low-yield nuclear weapons so that we can answer a cyber attack because we’re so bad at cyber security.’ That’s just fundamentally not true,” Gen. Paul Selva, vice chairman of the Joints Chiefs of Staff, said Tuesday at a meeting with reporters. It’s an idea that military leaders have been pushing back against since the New York Times ran a Jan. 16 story headlined, “Pentagon Suggests Countering Devastating Cyberattacks With Nuclear Arms.” When would the U.S. launch a nuclear attack in response to a non-nuclear event? The Defense Department says the threshold hasn’t changed since the Obama administration’s own nuclear posture review in 2010, but a draft of the new review that leaked online caused a bit of drama in its attempts to dispel “ambiguity.” The new review gives examples of “non-nuclear strategic attacks,” Robert Soofer, deputy assistant secretary for nuclear and missile defense policy, told reporters on Thursday. “It could be catastrophic attacks against civilian populations, against infrastructure. It could be an attack using a non-nuclear weapon against our nuclear command-and-control [or] early-warning satellites. But we don’t talk about cyber.” In his own conversation with reporters, Selva broadened “early warning” systems to include ones that provide “indications of warning that are important to our detection of an attack.” He also emphasized, “We never said ‘cyber.’” There’s a reason for that. While cyber attacks on physical infrastructure can be very dangerous, they are unlikely to kill enough people to provoke a U.S. nuclear response. An National Academies of Science and Engineering analysis of the vulnerability of U.S. infrastructure makes that point. A major cyber attack could cut off electrical power, resulting in “people dying from heat or cold exposure, etc.,” said Granger Morgan, co-director of the Carnegie Mellon Electricity Industry Center and one of the chairs of the report. “A large outage of long duration could cover many states and last for weeks or longer. Whether and how many casualties there could be would depend on things like what the weather was during the outage.” It’s a huge problem but not an event resulting in tens of thousands of immediate deaths. Contrast that with a nuclear attack on a city like Moscow, even one using a device of 6 kilotons, much smaller than the ones the United States used against Japanese targets in World War II. The immediate result: there would be 40,000 deaths, according to the online nuclear simulation tool NukeMap. Russia has demonstrated a willingness to take down power services with cyber attacks, as they did in Ukraine on Christmas Eve 2015. But these attacks were brief and occured in the context of actual fighting. In other words, the worst cyber physical attack that top experts believe credible likely does not meet the threshold that the Defense Department has set out for deploying a nuclear weapon. A somewhat more likely scenario: an attack that interferes with the ability of the U.S. to access data from the Space-Based Infrared System or other some other early warning indicator. By the Defense Department’s reasoning, that might draw a nuclear response. But that’s a specific attack that could portend a nuclear first strike. As the U.S. adds more satellites, sensors, ground stations and other pieces of technology to its early warning network, the chances of a mishap rise — a troubling prospect that we’ve covered. But it’s a separate issue. But isn’t the potential for a cyber-physical attack becoming greater? Asked about it on Thursday, Greg Weaver, the Joint Staff deputy director of strategic capabilities, said, “Not sure I agree with that.” He added, “There’s no intent to expand the range of circumstances.” Said Soofer, the deputy assistant defense secretary: “We maintain in this document, as in other documents, that we retain some level of ambiguity that we would use nuclear weapons. And so when you talk about using nuclear weapons to deter non nuclear attacks, it’s all going to be situationally dependent. It’s all contextual. If an attack that doesn’t cause a lot of casualties …and the President has a lot of tools with which to respond. … conventional tools, nuclear tools, cyber tools. He or she will make that decision based on the circumstances.” On Friday, John Rood, defense undersecretary for policy, was asked whether a service disruption would prompt a nuclear retaliation. He did not directly respond. But he did say that the threshold for launching a nuclear strike is going up, not down. Before launching a strike in response to a cyber attack on a power plant, for instance, U.S. officials would want a lot of questions answered. “In the hypotheticals you cite, would that also involve the use of biological weapons against the U.S. population or allies? Would it involve the use of chemical weapons against our people? Would it involve a conventional attack against the U.S. or our allies in other parts of the world? The context in which an attack occurred would be how we would evaluate an appropriate response.”

### 1NC---AT: Quantum

#### Quantum Computing is a pipe dream- runtime, temperature, scale, progress.

- Can only last for .0009 seconds before the Qubit’s destabilize

- Needs to be within .01 K to run

- Every component added increases heat, which makes scaling them impossible

- We’re several orders of magnitude away from being able to use them for hard problems, ie: their imapcts

Andrew **Tarantola 18** {Associate Editor at Engadget, 5-31-2018, “America can't solve its migrant labor crisis with automation”, https://www.engadget.com/2018/05/31/america-migrant-labor-automation/}//JM

Despite the hype and hoopla surrounding the burgeoning field of quantum computing, the technology is still in its infancy. Just a few years ago, researchers were making headlines with rudimentary machines that housed less than a dozen qubits -- the quantum version of a classical computer's binary bit. At IBM's inaugural Index Developer Conference held in San Francisco this week, the company showed off its latest prototype: a quantum computing rig housing 50 qubits, one of the most advanced machines currently in existence. Quantum computing -- with its ability to calculate and solve algorithms in parallel, at speeds far faster than conventional computers -- promises to revolutionize fields from chemistry and logistics to finance and physics. The thing is, while quantum computing is a technology for the world of tomorrow, it hasn't yet advanced far enough for anyone to know what that world will actually look like. "People aren't going to just wake up in three or four years, and say, 'Oh okay, now I'm ready to use quantum, what do I have to learn,'" Bob Sutor, VP of IBM Q Strategy and Ecosystem at IBM Research, told Engadget. These systems rely on the "spooky" properties of quantum physics, as Einstein put it, and their operation is radically different from how today's computers work. "What you're basically doing is you're replacing the notion of bits with something called qubits," Sutor said. "Ultimately when you measure a qubit it's zero or one, but before that there's a realm of freedom of what that can actually be. It's not zero and one at the same time or anything like this, it just takes on values from a much, much larger mathematical space. "The basic logic gates [AND, OR, NOT, NOR, etc], those gates are different for quantum," he continued. "The way the different qubits work together to get to a solution is completely different from the way the bits within your general memory works." Rather than tackling problems in sequence, as classical computers do, quantum rigs attempt to solve them in parallel. This enables quantum computers to solve certain equations, such as modeling complex molecules, far more efficiently. This efficiency, however, is tempered by the system's frailty. Currently, a qubit's coherence time tops out at 90 microseconds before decaying. That is, if a qubit is designated as a 1, it'll only remain a 1 for 0.0009 seconds. "After that all bets are off. You've got a certain amount of time in which to actually use this thing reliably," Sutor said. "Any computations you're going to do with a qubit have to come within that period." As such quantum computers are highly sensitive to interference from temperature, microwaves, photons, even the electricity running the machine itself. Sutor said, "With heat you've got lots of electrons moving around, bumping into each other," which can lead to the qubit's decoherence. That's why these rigs have to be cooled to near absolute zero on order to operate. "Outer space in the shade is between two and three degree Kelvin," Sutor explained. "Outer space is much too warm to do these types of calculations." Instead, the lowest levels of a quantum computer rig, where the calculations themselves take place, exist at a frosty 10 millikelvin -- a hundreth of a degree above absolute zero. So no, Sutor assured Engadget, we probably shouldn't expect desktop quantum computers running at room temperature to exist within the next few decades -- perhaps even within our lifetimes. Surprisingly, these systems are fairly energy efficient. Aside from the energy needed to sufficiently cool the system for operation (a process that takes around 36 hours) IBM's 50-qubit rig only draws 10 to 15 kilowatts of power -- roughly equivalent to 10 standard microwave ovens. So now that IBM has developed a number of quantum computer systems ranging from 5 to 50 qubits, the next challenge is figuring out what to do with them. And that's where the company's Q network comes in. Last December, IBM announced that it's partnering with a number of Fortune 500 companies and research institutes -- including JPMorgan Chase, Samsung, Honda, Japan's Keio University, Oak Ridge National Lab and Oxford University -- to suss out potential practical applications for the technology. Learning centers like Keio University also act as localized hubs. "We in IBM research, while we have a large team on this, we can't work with everybody in the world who wants to work on quantum computing," Sutor explained. These hubs, however, "can work with local companies, local colleges, whomever to do whatever. They would get their quantum computer power from us, but they would be at the front lines." The same is true for Oakridge National Lab, Oxford University and the University of Melbourne. What's more, the company has also launched the IBM Q experience which allows anyone -- businesses, universities, even private citizens -- to write and submit their own quantum application or experiment to be run on the company's publicly available quantum computing rig. It's essentially a cloud service for quantum computations. So far more than 75,000 people have taken advantage of the service, running more than 2.5 million calculations which have resulted in more than two dozen published research papers on subjects ranging from quantum phase space measurement to homomorphic encryption. But while the public's interest in this technology is piqued, there is a significant knowledge gap that must be overcome before we start to see quantum applications proliferate the way classical programs did in the 1970s and '80s. "Let's say in the future you're running investment house types of calculations [similar to the financial risk applications that JP Morgan is currently developing]," Sutor points out, "there are big questions as to what those would be, and what the algorithms would be. We're way too early to have anything determined like that, even to the extent of knowing how well [quantum computing] will be applicable in some of these other areas." The entry point for writing programs is a challenge too. For classical computers, it's as simple as running a compiler. But there's not yet such a function for quantum computers. "What does it mean to optimize a quantum program knowing that this completely different from the model that's in your phone?" he queried. Another challenge that must be overcome is how to scale these machines. As Sutor points out, it's a simple enough task to add qubits to silicon chips, but every component added, increases the amount of heat generated and the amount of energy needed to keep the system within its operational temperature boundaries. So rather than simply packing in more and more qubits and setting off a quantum version of Moore's Law, Sutor believes that the next major step forward for this technology is quality over quantity. "Having 50 great qubits is much more powerful than having 2,000 lousy ones," he quipped. "You don't want something very noisy that you're going to have to fix," but instead research should focus on improving the system's fidelity over increasing the qubit count. But even as quantum technologies continue to improve, there will still be a place in the world of tomorrow for classical computers. "Don't think of quantum as a wholesale replacement for anything you do," Sutor warned. "The theory says that you could run any classical algorithm on a quantum rig but it would be so glacially slow because it's not designed to run those types of products." Instead, Sutor prefers to think of the current crop of quantum technologies as an accelerator. "It does certain things very quickly, it does some things we don't know how to do well classically... and so it'll work hand in hand that way." And if you're waiting for today's quantum computers to be able to compete with modern supercomputers anytime soon, you shouldn't hold your breath. "We need to get several orders of magnitude better than we are now to probably move into that period where we're solving the really super hard problems," he said.

#### Advanced quantum computing is far away- prefer quantum physicists or sensationalist media

Michael **Biercuk 17** {Prof. Michael J. Biercuk is a quantum physicist, innovator, and Director of the Quantum Control Laboratory at the University of Sydney. 8/23/2017. “Hype and cash are muddying public understanding of quantum computing. “https://phys.org/news/2017-08-hype-cash-muddying-quantum.html}//JM

Conventional computer microprocessors can have more than one billion fundamental logic elements, known as transistors. In quantum systems, the fundamental quantum logic units are known as qubits, and for now, they mostly number in the range of a dozen. Such devices are exceptionally exciting to researchers and represent huge progress, but they are little more than toys from a practical perspective. They are not near what's required for factoring or any other application – they're too small and suffer too many errors, despite what the frantic headlines may promise. For instance, it's not even easy to answer the question of which system has the best qubits right now. Consider the two dominant technologies. Teams using trapped ions have qubits that are resistant to errors, but relatively slow. Teams using superconducting qubits (including IBM and Google) have relatively error-prone qubits that are much faster, and may be easier to replicate in the near term. Which is better? There's no straightforward answer. A quantum computer with many qubits that suffer from lots of errors is not necessarily more useful than a very small machine with very stable qubits. Because quantum computers can also take different forms (general purpose versus tailored to one application), we can't even reach agreement on which system currently has the greatest set of capabilities. Similarly, there's now seemingly endless competition over simplified metrics such as the number of qubits. Five, 16, soon 49! The question of whether a quantum computer is useful is defined by much more than this. Where to from here? There's been a media focus lately on achieving "quantum supremacy". This is the point where a quantum computer outperforms its best classical counterpart, and reaching this would absolutely mark an important conceptual advance in quantum computing. But don't confuse "quantum supremacy" with "utility". Some quantum computer researchers are seeking to devise slightly arcane problems that might allow quantum supremacy to be reached with, say, 50-100 qubits – numbers reachable within the next several years. Achieving quantum supremacy does not mean either that those machines will be useful, or that the path to large-scale machines will become clear. Moreover, we still need to figure out how to deal with errors. Classical computers rarely suffer hardware faults – the "blue screen of death" generally comes from software bugs, rather than hardware failures. The likelihood of hardware failure is usually less than something like one in a billion-quadrillion, or 10-24 in scientific notation. The best quantum computer hardware, on the other hand, typically achieves only about one in 10,000, or 10-4. That's 20 orders of magnitude worse. Is it all just engineering? We're seeing a slow creep up in the number of qubits in the most advanced systems, and clever scientists are thinking about problems that might be usefully addressed with small quantum computers containing just a few hundred qubits. But we still face many fundamental questions about how to build, operate or even validate the performance of the large-scale systems we sometimes hear are just around the corner. As an example, if we built a fully "error-corrected" quantum computer at the scale of the millions of qubits required for useful factoring, as far as we can tell, it would represent a totally new state of matter. That's pretty fundamental. At this stage, there's no clear path to the millions of error-corrected qubits we believe are required to build a useful factoring machine. Current global efforts (in which this author is a participant) are seeking to build just one error-corrected qubit to be delivered about five years from now. At the end of the day, none of the teams mentioned above are likely to build a useful quantum computer in 2017 … or 2018. But that shouldn't cause concern when there are so many exciting questions to answer along the way.

#### New crypto security innovations can’t be cracked by quantum computers.

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Math is hard. Indeed, much of the modern infrastructure for secure communication depends heavily on the difficulty of elementary mathematics — of factoring, to be exact. It’s easy to reduce a small number like 15 to its prime factors (3 x 5), but factoring numbers with a few hundred digits is still exceedingly difficult. For this reason, the RSA cryptosystem, an encryption scheme that derives its security from the difficulty of integer factorization, remains a popular tool for secure communication. Research suggests, however, that a quantum computer would be able to factor a large number far more quickly than the best available methods today. If researchers could build a quantum computer that could outperform classical supercomputers, the thinking goes, cryptographers could use a particular algorithm called Shor’s algorithm to render the RSA cryptosystem unsalvageable. The deadline to avert this may arrive sooner than we think: Google recently claimed that its quantum computers will be able to perform a calculation that’s beyond the reach of any classical computer by the end of the year. In light of this, cryptographers are scrambling to find a new quantum-proof security standard. Yet perhaps RSA isn’t in as much trouble as researchers have assumed. A few weeks ago, a paper surfaced on the Cryptology ePrint Archive that asked: “Is it actually true that quantum computers will kill RSA?” The authors note that even though a quantum computer running Shor’s algorithm would be faster than a classical computer, the RSA algorithm is faster than both. And the larger the RSA “key” — the number that must be factored — the greater the speed difference. The authors of the paper estimate that attacking a terabyte-size key using Shor’s algorithm would require around 2100 operations on a quantum computer, an enormous number comparable to the total number of bacterial cells on Earth. The authors don’t convert this to a concrete time estimate, but current research suggests that a real quantum computer wouldn’t be able to accomplish this in any reasonable amount of time. “RSA is not entirely dead even if quantum computers are practical,” said Nadia Heninger, an assistant professor of computer and information science at the University of Pennsylvania and a co-author of the paper. The paper also shows how to implement such a massive RSA key, which had not been done before. Still, a terabyte-size key isn’t exactly easy to work with. (The largest RSA keys right now are a few thousand bits; a terabyte is many trillions of bits.) The authors report that generating a terabyte-size RSA key and carrying out the encryption-decryption process takes about five days. “The encryption and decryption cost is terrible for most applications,” said Scott Aaronson, the director of the Quantum Information Center at the University of Texas, Austin. What’s more, the security we gain from using enormous RSA keys is “extremely precarious, vulnerable to even a modest improvement in algorithms or hardware, or a determined and well-funded-enough adversary.” “Scott is thinking in a theoretical sense,” said Heninger, who maintains that the gap is enough “from a concrete security point of view.” “More importantly,” the paper states, “it is interesting to see that the conventional wisdom is wrong.”

### 1NC---AT: Disease

#### Status quo solves- decoding the human immune system is both necessary and will be accomplished within a decade

Wayne **Koff et al. 18** {Wayne C. Koff is president and CEO of the Human Vaccines Project in New York. Peter C. Doherty is a Nobel Laureate professor of microbiology and immunology at the University of Melbourne. Margaret A. Hamburg is the foreign secretary of the National Academy of Medicine in Washington, D.C., and a former FDA commissioner. 1-23-2018. “To thwart flu pandemics, we need to decode the human immune system.” https://www.statnews.com/2018/01/23/flu-pandemics-immune-system/}//JM

Science is now poised to change all that. In the not-too-distant future, we predict that researchers will be able to harness the human immune system to prevent and control disease in ways previously considered unimaginable: one-shot vaccines that offer lifelong protection in everyone; a universal influenza vaccine that protects against seasonal and pandemic outbreaks of flu; vaccines against currently intractable infectious diseases; and, one day, vaccines against noninfectious chronic diseases, everything from cancer to heart disease and Alzheimer’s disease. Decoding the human immune system holds the key to the development of such new and improved vaccines. Deciphering the human immunome, the universal and common elements of the B and T cell receptors that make up the adaptive immune system, will facilitate germline targeting and structure-assisted vaccine discovery. Understanding the mechanisms for protective immunity will enable rational vaccine design aimed at specifically inducing such immune effector mechanisms. This is finally possible because of the convergence of technological advances across biomedical, computer, and engineering sciences, including the enhancement of artificial intelligence and machine learning capabilities to analyze and interpret unprecedented quantities of data. In the same way that the Human Genome Project transformed biomedical research and enabled the genesis of personalized medicine, and the Hubble Telescope transformed planetary sciences and our understanding of the universe, decoding the human immune system has the potential to revolutionize 21st century global health, ushering in new advances in diagnostics, vaccines and therapeutics. It won’t be cheap, and it won’t be easy. Decoding the human immune system will take a decade of research and cost more than $1 billion. It will require innovative public-private partnerships working collectively to decipher the common components and rules of human immunity. But the return on investment — a blueprint for how the immune system fights disease — will be extraordinary and applicable to all facets of human health. Deciphering how the human immune system combats disease is one of the greatest frontiers of science, and is now within reach. If society grasps this unprecedented opportunity, commits resources to it, and facilitates creative new models for working together across multiple scientific disciplines, we can not only eliminate the threat of pandemic influenza but reshape how we approach all life-threatening diseases.

#### No impact to disease—adaptation, familiarity, burnout.

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For most of mankind’s history, infectious diseases were the existential threat to humanity—and for good reason. They were quite successful at killing people: The 6th century’s Plague of Justinian knocked out an estimated 17 percent of the world’s population; the 14th century Black Death decimated a third of Europe; the 1918 influenza pandemic killed 5 percent of the world; malaria is estimated to have killed half of all humans who have ever lived. Any yet, of course, humanity continued to flourish. Our species’ recent explosion in lifespan is almost exclusively the result of the control of infectious diseases through sanitation, vaccination, and antimicrobial therapies. Only in the modern era, in which many infectious diseases have been tamed in the industrial world, do people have the luxury of death from cancer, heart disease, or stroke in the 8th decade of life. Childhoods are free from watching siblings and friends die from outbreaks of typhoid, scarlet fever, smallpox, measles, and the like. So what would it take for a disease to wipe out humanity now? In Michael Crichton’s The Andromeda Strain, the canonical book in the disease-outbreak genre, an alien microbe threatens the human race with extinction, and humanity’s best minds are marshaled to combat the enemy organism. Fortunately, outside of fiction, there’s no reason to expect alien pathogens to wage war on the human race any time soon, and my analysis suggests that any real-life domestic microbe reaching an extinction level of threat probably is just as unlikely. Any apocalyptic pathogen would need to possess a very special combination of two attributes. First, it would have to be so unfamiliar that no existing therapy or vaccine could be applied to it. Second, it would need to have a high and surreptitious transmissibility before symptoms occur. The first is essential because any microbe from a known class of pathogens would, by definition, have family members that could serve as models for containment and countermeasures. The second would allow the hypothetical disease to spread without being detected by even the most astute clinicians. The three infectious diseases most likely to be considered extinction-level threats in the world today—influenza, HIV, and Ebola—don’t meet these two requirements. Influenza, for instance, despite its well-established ability to kill on a large scale, its contagiousness, and its unrivaled ability to shift and drift away from our vaccines, is still what I would call a “known unknown.” While there are many mysteries about how new flu strains emerge, from at least the time of Hippocrates, humans have been attuned to its risk. And in the modern era, a full-fledged industry of influenza preparedness exists, with effective vaccine strategies and antiviral therapies. HIV, which has killed 39 million people over several decades, is similarly limited due to several factors. Most importantly, HIV’s dependency on blood and body fluid for transmission (similar to Ebola) requires intimate human-to-human contact, which limits contagion. Highly potent antiviral therapy allows most people to live normally with the disease, and a substantial group of the population has genetic mutations that render them impervious to infection in the first place. Lastly, simple prevention strategies such as needle exchange for injection drug users and barrier contraceptives—when available—can curtail transmission risk. Ebola, for many of the same reasons as HIV as well as several others, also falls short of the mark. This is especially due to the fact that it spreads almost exclusively through people with easily recognizable symptoms, plus the taming of its once unfathomable 90 percent mortality rate by simple supportive care. Beyond those three, every other known disease falls short of what seems required to wipe out humans—which is, of course, why we’re still here. And it’s not that diseases are ineffective. On the contrary, diseases’ failure to knock us out is a testament to just how resilient humans are. Part of our evolutionary heritage is our immune system, one of the most complex on the planet, even without the benefit of vaccines or the helping hand of antimicrobial drugs. This system, when viewed at a species level, can adapt to almost any enemy imaginable. Coupled to genetic variations amongst humans—which open up the possibility for a range of advantages, from imperviousness to infection to a tendency for mild symptoms—this adaptability ensures that almost any infectious disease onslaught will leave a large proportion of the population alive to rebuild, in contrast to the fictional Hollywood versions. While the immune system’s role can never be understated, an even more powerful protector is the faculty of consciousness. Humans are not the most prolific, quickly evolving, or strongest organisms on the planet, but as Aristotle identified, humans are the rational animals—and it is this fundamental distinguishing characteristic that allows humans to form abstractions, think in principles, and plan long-range. These capacities, in turn, allow humans to modify, alter, and improve themselves and their environments. Consciousness equips us, at an individual and a species level, to make nature safe for the species through such technological marvels as antibiotics, antivirals, vaccines, and sanitation. When humans began to focus their minds on the problems posed by infectious disease, human life ceased being nasty, brutish, and short. In many ways, human consciousness became infectious diseases’ worthiest adversary. None of this is meant to allay all fears of infectious diseases. To totally adopt a Panglossian viewpoint would be foolish—and dangerous. Humans do face countless threats from infectious diseases: witness Zika. And if not handled appropriately, severe calamity could, and will, ensue. The West African Ebola outbreak, for instance, festered for months before major efforts to bring it under control were initiated. When it comes to infectious diseases, I’m worried about the failure of institutions to understand the full impact of outbreaks. I’m worried about countries that don’t have the infrastructure or resources to combat these outbreaks when they come. But as long as we can keep adapting, I’m not worried about the future of the human race.

#### AI wont get used in healthcare—needs access to protected data.

Patricia **Balthazar et al. 18** {The Journal of the American College of Radiology (sometimes abbreviated JACR) is a monthly peer-reviewed medical journal covering radiology. March 2018. “Protecting Your Patients’ Interests in the Era of Big Data, Artificial Intelligence, and Predictive Analytics.” https://www.sciencedirect.com/science/article/pii/S1546144017315995}//JM

When Google DeepMind needed to test an app to provide alerts for patients at risk for worsening [renal disease](https://www.sciencedirect.com/topics/medicine-and-dentistry/nephropathy), it gathered the records of 1.6 million patients from the Royal Free Hospital. The Information Commissioner’s Office, an “independent authority set up to uphold information rights in the public interest, promoting openness by public bodies and data privacy for individuals” in the United Kingdom, disapproved, finding that the arrangement between the two entities broke the law and failed to uphold the data privacy rights of individuals 1, 2. Although disclosures of patient information for direct patient care are widely accepted, otherwise identical disclosures for research and development require informed consent. The distinction between patient care and research is widely recognized, yet its proper application in the setting of new techniques can elude even the most capable organizations. Imaging is a robust source of phenotypic information suitable for the application of big data, artificial intelligence, and personalized medicine methods. Industry has taken notice of this relatively unexplored frontier and spent considerable resources surveying options to harness the power of imaging data 3, 4, eagerly seeking partners in health care. Although some have forged ahead, others have reconsidered their initial forays into this space with industry partners 5, 6. Because the conversation often begins with imaging and the [radiology](https://www.sciencedirect.com/topics/medicine-and-dentistry/radiology) department, it behooves any [health care provider](https://www.sciencedirect.com/topics/medicine-and-dentistry/health-care-provider), department, or system to consider important questions regarding their big data and artificial intelligence efforts, whether internally or in partnership with external partners. We have long subscribed to ethical and regulatory frameworks to guide our use of patient and research subject data. In many cases, we seem unsure of how to apply these conventions in the era of big data and artificial intelligence, with their seemingly insatiable appetite for more information. These methods have real consequences, with the potential to affect the lives of individuals and populations in ways that could benefit some while harming others. Here, we touch on the major principles of existing applicable frameworks in this setting, explore known issues when dealing with big data and machine learning in health care, explore perspectives from key stakeholders, and pose questions for discussion for imaging health care professionals to consider as they embark on their own big data and artificial intelligence ventures.

### 1NC---AT: Climate Change

#### AI models are a drop in the bucket- only our card does the math.

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You can almost feel the planet writhing. This summer brought some of the biggest, most destructive storms in recorded history: Harvey laid waste to huge swathes of Texas; Irma left Barbuda virtually uninhabitable; Maria ravaged Dominica and plunged Puerto Rico into darkness. The images we see in the media are almost too violent to comprehend. And these are the storms that made the news; many others did not. Monsoon flooding in India, Bangladesh and Nepal killed 1,200 people and left millions homeless, but Western media paid little attention: it’s too much suffering to take in at once. What’s most disturbing about this litany of pain is that it’s only going to get worse. A recent paper in the journal Nature estimates that our chances of keeping global warming below the danger threshold of 2 degrees is now vanishingly small: only about 5 per cent. It’s more likely that we’re headed for around 3.2 degrees of warming, and possibly as much as 4.9 degrees. If scientists are clear about anything, it’s that this level of climate change will be nothing short of catastrophic. Indeed, there’s a good chance that it would render large-scale civilization impossible. Why are our prospects so bleak? According to the paper’s authors, it’s because the cuts we’re making to greenhouse gas emissions are being more than cancelled out by economic growth. In the coming decades, we’ll be able to reduce the carbon intensity (CO2 per unit of GDP) of the global economy by about 1.9 per cent per year, they say, if we make heavy investments in clean energy and efficient technology. That’s a lot. But as long as the economy keeps growing by more than that, total emissions are still going to rise. Right now we’re ratcheting up global GDP by 3 per cent per year. At that rate, the maths is not in our favour; on the contrary, it’s slapping us in the face. In fact, according to new models published last year, with a background rate of 3 per cent GDP growth it’s not possible to achieve any level of emissions reductions at all, even under best-case-scenario conditions. Study after study shows the same thing: keeping global warming below 2 degrees is simply not compatible with continued economic growth. This is a tough pill to swallow. After all, right now GDP growth is the primary policy objective of virtually every government on Earth. Over in Silicon Valley, tech-optimists are hoping that a miracle of artificial intelligence might allow us to decarbonise the economy by 3 per cent or more per year, so we can continue growing the GDP while reducing emissions. It sounds wonderful. But remember, the goal is not just to reduce carbon emissions – the goal is to reduce them dramatically, and fast. How fast, exactly? Climate scientists Kevin Anderson and Alice Bows say that if we want to have even a mere 50 per cent chance of staying under 2 degrees, rich nations are going to have to cut emissions by 8-10 per cent per year, beginning in 2015. Keep in mind we’re already two years in, and so far our emissions reductions have been zero. Here’s the hard bit. It’s just not possible to achieve emissions reductions of 8-10 per cent per year by decarbonising the economy. In fact, there is a strong scientific consensus that emissions reductions of this rate are only feasible if we stop our mad pursuit of economic growth and do something totally unprecedented: begin to scale down our annual production and consumption. This is what ecologists call ‘planned de-growth’. It sounds horrible, at first glance. It sounds like austerity, or voluntary poverty. After all, for decades we’ve been told that GDP growth is good, that it’s essential to progress, and that if we want to eradicate poverty around the world, we need more of it. The only reason we’re all chasing GDP growth is because we’ve been made to believe that it’s the only way to improve the incomes and lives of ordinary people. But it’s not. Politicians and economists rally around GDP growth because they see it as preferable to redistribution. They would rather grow the pie than go about the messy business of sharing what we already have more equally, since the latter tends to upset rich people. Henry Wallich, a former member of the US Federal Reserve Board, made this clear when he pointed out that ‘Growth is a substitute for equality’. But we can flip Wallich’s greedy little quip on its head: if growth is a substitute for equality, then equality can be a substitute for growth. By sharing what we already have more fairly, we can render additional economic growth unnecessary. In this sense, de-growth is nothing at all like austerity. In fact, it’s exactly the opposite. Austerity means cutting social spending and slashing taxes on the rich in order to – supposedly – keep the economy growing. This has crushing consequences for ordinary people’s lives. De-growth, by contrast, calls for cutting the excesses of the richest while redistributing existing resources and investing in social goods – universal healthcare, education, affordable housing etc. The whole point is to sustain and even improve human wellbeing without the need for endless economic expansion. De-growth is a philosophy that insists that our economy is already more than abundant enough for all of us – if only we learn how to share it. One easy way to do this would be to roll out a universal basic income and fund it through new progressive taxes – taxes on carbon, on land, on resource use, on financial transactions, and so on. This is the most sensible and elegant way to share our abundance, and it comes with an added benefit: if the basic income is high enough, it will free people to walk away from unnecessary jobs that produce unnecessary stuff, releasing some of the pressure on our planet. Crucially, de-growth does not mean we have to get rid of the stock of stuff that we already have, as a nation: houses, furniture, shoes, museums, railways, whatever. In fact, it doesn’t even mean that we have to stop producing and consuming new stuff. It just means we have to reduce the amount of new stuff that we produce and consume each year. When you see it this way, it’s really not so threatening. If we degrow by 5 per cent per year (which is what scientists say is necessary), that means we have to cut our consumption of new stuff by 5 per cent. It’s easy to make up for that by just repairing and reusing stuff we already have. And we can encourage this more creative approach to stuff by curbing advertising, like Sao Paulo, Chennai and other cities have done. Of course, there are deeper, more structural dimensions of our economy that we will have to change. One of the reasons we need growth is to pay off all the debt that’s sloshing around in our economy. In fact, our entire money system is based on debt: more than 90 per cent of the currency circulating in our economy is loans created out of thin air by commercial banks. The problem with debt is that it comes with interest, and to pay off interest at a compound rate we have to work, earn, and sell more and more each year. In this sense, every dollar of new money we create heats up the planet. But cancel the debt and shift to a debt-free currency, and suddenly we don’t have to labour under this relentless pressure. There are already plenty of ideas out there for how to do this. Still, we have to be honest with ourselves: : the Stern Review projects that climate change is set to cost us 5-20 per cent of global GDP per year, which is going to violently change our economy beyond all recognition, and cause enormous human suffering in the process. The storms that churned across the Atlantic this summer are only a small taste of what is to come. The choice is clear: either we evolve into a future beyond capitalism, or we won’t have a future at all.

#### We passed the tipping point- 400 ppm.

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“Five-nine” doesn’t have quite the cadence as “nine-eleven,” but when we look back on the early 21st century, I believe that May 9, 2013 — the day the concentration of carbon dioxide in the atmosphere exceeded 400 parts per million for the first time in recorded history — may in the future be understood as a far more important date than September 11, 2001. It may even be that 5/9 will be seen as the long-anticipated tipping point at which human impacts caused irrevocable harm to our planet. Or perhaps not. Perhaps there’s still time to take the concrete, immediate actions experts suggest — along the minimum efforts laid out in the 2015 Paris accord that amplified suggestions made by President Barack Obama in his June 25, 2013 speech at Georgetown University — that would ensure a sustainable, high-quality future. Tipping points are the cusp between one set of conditions and another; when a tipping point is passed, change is rapid, uncontrolled and often irreversible. Passing a tipping point is like crossing a threshold from one room to another and having the door triple-locked behind you; the state of the world after the tipping point is very different from the state of the world before the tipping point, and it is very difficult to go back. It’s important to make this distinction, because Malcolm Gladwell erroneously redefined tipping points more than a decade ago in his book, The Tipping Point: How Little Things Can Make a Big Difference. In doing so, he changed the way we think about rapidly emerging social phenomena, such as the Dutch tulip frenzy, the housing bubble, or the re-emergence of a market for Hush Puppies. Although many have argued that the publication of The Tipping Point itself was a tipping point in how we think and talk about tipping points, Gladwell weakly equated tipping points with viral epidemics. This misleading analogy obscured the true meaning of “tipping point,” leading to confusion in how we think about responding to rapid environmental change. Epidemics, you see, require an initial infection in a particular individual, a pool of nearby people susceptible to the same infection, and a way for the disease to be transmitted to the susceptible individuals. Gladwell similarly invoked mavens, connectors and salesmen who collect and transmit new ideas to the wider world to explain the rapid emergence of new social phenomena. But this analogy doesn’t necessarily work; resistance evolves to new diseases, epidemics peak and burn out, and most new social phenomena are simply fads. In fact all of the examples in The Tipping Point — the sudden emergence of fax machines and Airwalk sneakers, the resurgence of sales of Hush Puppies suede shoes, the rise and fall of crime rate in many cities (that is rising once again in some), and sudden epidemics of suicides — are of explosions of interest in new phenomena followed by a return to the status quo ante and a search for the next new fad. But they are not tipping points. In contrast, economists, sociologists, historians, ecologists, climatologists, oceanographers and most others who for decades have given serious study to tipping points focus on rapid, seemingly permanent changes. In modern parlance, a tipping point presages a change in regime. And the prime example of a tipping point in the natural world is, many feel, climate change. Bill McKibben and the thousands of followers of 350.org working to solve the climate crisis assert that we passed a tipping point in the 1980s, when human industry caused the concentration of atmospheric CO2 to exceed 350 ppm: the so-called “safe” level of CO2 in the atmosphere. President Obama noted at Georgetown that the National Oceanic and Atmospheric Administration has been measuring CO2 since the 1950s because of that agency’s even earlier concern that the levels of carbon dioxide in the atmosphere would disrupt the fragile balance of nature that makes our planet so hospitable to life and push us over the tipping point that leads to a planet beyond repair. So on 5/9 — when NOAA’s observatory atop Mauna Loa, Hawaii, recorded a concentration of carbon dioxide in the atmosphere that exceeded 400 parts per million (0.04 percent) for the first time in recorded history — a tipping point finally may have been passed. Although the deciduous forests of the northern hemisphere that provide New England with spectacular colors every fall will inhale some of that CO2 as they leaf out every spring, those great “lungs of the planet” cannot keep the CO2 in the atmosphere below 400 ppm. And even if an all-powerful deity were to manage to convince us to stop burning of all fossil fuels today, the “inertia” in the climate system would ensure that the Earth’s temperature would keep increasing and sea levels would continue to rise another meter or two over the next 2,000 years. The inexorable warming of the planet caused by an ever-denser blanket of CO2 above us is not a fad — on 5/9, we passed a tipping point and entered a new world. This new reality is a consequence of our lifestyles intersecting with fundamental and unbreakable laws of physics. We simply need to own up to the fact that we are in a new climatic regime; global warming indeed is happening now. It’s not a short-term trend, and it’s not going away

#### The Anthropocene is unsalvageable- AI just adds to the problem

Rob **Seimetz 17** {CounterPunch is a magazine published six times per year in the United States that covers politics in a manner its editors describe as "muckraking with a radical attitude". It has been described as left-wing. 11-30-2017. “What Does It Mean to Live in the Age of the Anthropocene?” https://www.counterpunch.org/2017/11/30/what-does-it-mean-to-live-in-the-age-of-the-anthropocene/}//JM

It’s another day in the age of the Anthropocene where a global game of musical chairs continues to play out. As humans continue to plunder and pillage the earth in a global economy that thrives on converting the living to the dead, more chairs get removed from the game. The game doesn’t care about your race, gender, or class it just needs your chair so those that think they are watching the game from afar can enrich themselves at the expense of the living. What these game managers do not know is they are part of the game as well. The only living organism that gets to see the end of the game is Mother Earth, and it will squeeze humans and most other living beings on this planet out of existence. These psychopathic oligarchs are nothing more than a pimple on Mother Earth’s ass. Many experts believe the age of the Anthropocene began in [1950](https://amp.theguardian.com/environment/2016/aug/29/declare-anthropocene-epoch-experts-urge-geological-congress-human-impact-earth) shortly after the United States dropped nuclear bombs on Japan. The Anthropocene is the age in which humans are causing massive changes to the planet which can include [mass extinctions of plant and animal species, polluted the oceans and altering the atmosphere](https://www.smithsonianmag.com/science-nature/what-is-the-anthropocene-and-are-we-in-it-164801414/). The Anthropocene epoch will also be known as the time of the decline and fall of the United States as the world’s global superpower. It will be a time where the global superpower torch will be passed to China. Some critics of U.S. Imperialism will gush at this passing of this torch, and continue to compliment China’s “New Silk Road” ambitions and their investment over intervention strategy. While I long and fight for an end to U.S. Imperialism, as well as, the U.S. ceasing to be the planet’s superpower, I will not celebrate the successes of China. China’s global model still includes converting the living planet to the dead that contributes to global consumption using global markets. China’s New Silk Road is going to cost roughly [900 billion dollars](http://www.weforum.org/agenda/2017/06/china-new-silk-road-explainer). This New Silk Road includes a “One Belt and One Road” mantra which will include land and maritime trading routes to connect Asia, Africa, and Europe. China calls this a new era of globalization where it will lend [8 trillion dollars in infrastructure to 68 countries](http://amp.weforum.org/agenda/2017/06/china-new-silk-road-explainer). They believe this will add a third to global GDP. Basically, they are looking to find ways for more people to consume more products to speed up the destruction of the living planet which will accelerate ecological collapse. This investment versus intervention strategy by China includes investing in a South American railway that would cut into the middle of the [Amazon rainforest](https://www.usnews.com/news/best-countries/articles/2017-09-25/latin-america-is-wary-of-china-despite-closer-ties?context=amp) that houses the lungs of our planet. Indeed, many geopolitical analysts are taking note of China’s investments in [Africa](https://www.forbes.com/sites/amyjadesimi/2017/03/14/how-chinas-60-billion-for-africa-will-drive-global-prosperity/amp/), [Latin America](https://www.nbcnews.com/news/world/amp/china-ventures-america-s-backyard-latin-america-n740001), Asia, and [Europe](https://www.bbc.co.uk/news/amp/world-europe-41654346). But are they taking note these investments are in [natural gas pipelines](http://mobile.reuters.com/article/amp/idUSKCN1C10I0), mining, roads, rails, infrastructure, and ports are an investment in accelerated human consumption, which has already led to [52%](https://relay.nationalgeographic.com/proxy/distribution/public/amp/news/2014/09/1409030-animals-wildlife-wwf-decline-science-world) of the world’s wildlife vanishing from 1970 to 2010? Are these analysts noting China can’t even clean up their own backyard? [This past October](http://mobile.reuters.com/article/amp/idUSKBN1DN0P0), data showed only four of 28 northern Chinese cities met their air quality targets in October and air quality in 338 Chinese cities worsened. While investors may be very “[bullish](https://www.forbes.com/sites/gilpress/2017/11/05/6-reasons-why-china-will-lead-in-ai/amp/)” about a [460 billion dollar](https://www.forbes.com/sites/ywang/2017/11/06/will-the-future-of-artificial-intelligence-look-chinese/amp/) investment into Artificial Intelligence, are they “bullish” about China using minerals from the earth that destroys the habitat of actual intelligent beings to create this artificial intelligence? More people are voicing their concerns at the income inequality exhibited throughout the world. It’s great people are voicing their displeasure that the planet’s [richest 1%](https://www.theguardian.com/inequality/2017/nov/14/worlds-richest-wealth-credit-suisse) owning half of the world’s wealth. It’s also great that it’s being pointed out [1,542 billionaires](https://www.theguardian.com/business/2017/oct/26/worlds-witnessing-a-new-gilded-age-as-billionaires-wealth-swells-to-6tn) have accumulated 6 trillion dollars of combined wealth which is up 17% from last year. But as many people rail against billionaire oligarchs do they realize out of the 195 new billionaires in 2017, 76 came from China? How many political pundits tell us this 76 were the most new billionaires from any other country this year? The Age of Anthropocene will be synonymous with words like “unprecedented”, “extinction”, “migration”, “collapse”, “ignorance”, and “greed” to name a few. It’s an age where global systems implemented by humans will have global impacts on all life on Earth.

#### No impact to climate change—the IPCC is a hack, no consensus, and adaptation

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1. The assault on honest debate More than an academic rejoinder, Hall et al.'s response gives the impression of a resolute protest petition (symbolically signed by 51 scholars) aimed at both Tourism Managementand the present dissenting authors for having the audacity to produce such a “deviant” paper, which sheds light on inconvenient (as far as the mainstream environmental movement goes) scientific evidence. The rhetoric style used by Hall el al. to undermine the arguments presented in our paper is well known to those who are familiar with the intense scientific debate on climate change. Climate change alarmists have never hesitated to ridicule and bully environmental skeptics, using ad hominem arguments, for example when labeling them as “deniers” (a designation invoking “holocaust deniers”) or “right-wing extremists,” dealing with “voodoo science.” These styles and language are indicative of an academic witch-hunt, rather than factual and productive scientific discourse. This disturbing approach has also been reflected in active attempts on behalf of powerful gatekeepers to censor and silence nonconforming voices. The email controversy at the Climatic Research Unit (CRU) at the University of East Anglia (best known as “Climategate”) revealed in 2009, demonstrated what can be easily be termed as “climate McCarthyism.” This scandal exposed plots by leading and influential researchers to academically cast off dissenting climatologists, suppress the publication of articles that failed to fall in line with the narrative of man-made global warming, and even removing “uncooperative” journal editors from their positions. In light of this upsetting background, we feel a strong sense of appreciation for the editor and reviewers of Tourism Management for recognizing the value of open debate on the subject and allowing it to take place in this important outlet. 2. The “consensus” on anthropogenic climate change Hall et al. accuse us of “climate change denial and misrepresentation” in arguing that “climate change is a highly controversial scientific topic” and that “the theory of anthropogenic global warming (AGW)…is far from being conclusive” (Shani & Arad, 2014, p. 82). In their attempt to refute these claims, Hall et al. first extensively refer to the reports of the UN's Intergovernmental Panel on Climate Change (IPCC), which decisively and consistently warn against dangerous and unprecedented man-made climate change. Yet, the reputation of the IPCC, “the Vatican of climate science,” has sustained serious harm in recent years due to accusations of tribalism, lack of scrutiny, and controversies such as Climagegate (the IPCC relied heavily on the scientific work of CRU) (Hulme & Ravetz, 2009). Climategate revealed the manipulation of scientific literature to be included in IPCC reports as well as intentional disregard of other peer-reviewed articles that were disagreeable with the IPCC's desired conclusions (Holliman, 2011, Ryghaug and Skjölsvold, 2010). Consequently, the InterAcademy Council (IAC), a global network consisting of over 106 national science academies, issued a critique of the IPCC's procedures and processes, indicating critical deficiencies in its work and pointing to the need for fundamental transformations to restore the perceived impartiality of the IPCC and to prevent incidents of groupthink in the future (Shapiro et al., 2010). There is not enough time or space to cover all the inaccuracies, misinformation and factual errors detected in IPCC reports. However, these include the Himalayan glaciers fiasco (in which the IPCC's claim that the glaciers in the Himalayas would melt away by 2035 was based on a misprint – for 2350 – in a story that appeared in an environmental pressure group's report) (Cogley, Kargel, Kaser, & van der Veen, 2010), and the deliberate concealment of scientific data invalidating the “hockey stick” graph, which (falsely) presented the 1990s as the hottest decade in the millennium (Holland, 2007, McKitrick, 2005). Given IPCC's problematic record, it is simply irresponsible to take their reports unquestionably, as Hall et al. do. Interestingly, they heavily criticized us for (negligibly, we might add) referring to “non-peer-reviewed” materials, such as reports from conservative think tanks (by the way, Cato Institute is far from being “conservative”). Perhaps Hall et al. should more seriously consider the idiom “people who live in glass houses shouldn't throw stones.” Following the summary of the IPCC's main conclusions, Hall et al. moves to establish their claim on “scientific consensus on anthropogenic climate change,” by detailing the resonant study of Cook et al. (2013). According to this study's findings, about 97% of abstracts of scientific papers on climate issues from 1991 to 2011 support the alleged consensus on AGW. The 97% figure indeed sounds impressive and received much attention in the media and from politicians and policymakers (including US President Barak Obama). Yet unfortunately, a careful review of the study and its methodology reveals that very little can actually be concluded. The “consensus” referred to in Cook et al.'s study (2013) applies to trivial consensus according to which carbon dioxide (CO2) is a greenhouse gas and that humanity is capable of warming the planet, premises that are accepted even among most climate change skeptics. Yet, issues such as the extent and rate of climate change, the extent of the human factor in causing climate change, the consequences of climate change, and the optimal strategies to respond to climate change are at the heart of the scientific debate. Cook et al.'s paper (2013), as well as other related studies such as Anderegg, Prall, Harold, and Schneider (2010), provide no valuable insights on the extent of agreement regarding AGW, but were nevertheless successfully utilized for public relations purposes. 3. Uncertainty in climate change assessments Hall et al. defend the IPCC's climate models and attack our assertion that they have thus far failed to demonstrate a high level of accuracy, citing the IPCC's accounts themselves as evidence. In doing so, they largely ignore the clear evidence that since 1997 there has been no discernible rise in aggregate global temperatures, despite continuing greenhouse gas emissions (Curry, 2014). Furthermore, despite the “very high confidence” the IPCC attributes to its models in reproducing observed temperatures, consistent large disparities have been detected between observed and simulated global warming (Christy et al., 2010, Douglass and Christy, 2013). Several explanations have been suggested for the – unforeseen by climate models – warming hiatus and the overestimated rise in temperatures (e.g., Fyfe et al., 2013, Solomon et al., 2010), but this clearly raises serious questions as to the confidence policymakers should place in the IPCC's projections of climate change (Curry, 2011). Despite the claims made by the IPCC (and also mentioned by Hall et al.), their profound understanding of the climate change mechanism does not seem to improve over time. Consider the crucial issue of climate sensitivity, i.e. the amount of warming that doubling CO2 in the atmosphere would eventually produce. According to the IPCC Fourth Assessment Report (2007), the equilibrium climate sensitivity is likely in the range 2 °C–4.5 °C, while according to its newer Fifth Assessment Report (2013) it is 1.5 °C–4.5 °C. In other words, the likely equilibrium sensitivity is now known less accurately. Astrophysicist and climate researcher Nir Shaviv responded to this lack of improved understanding, “After perhaps billions of dollars invested in climate research over more than three decades, our ability to answer the most important question in climate has not improved a single bit!” (2013, para 6). Shaviv accused the IPCC of dogmatic science that prevents its members from recognizing the errors in the basic premises of AGW. Other studies reported that climate sensitivity could be significantly lower than is suggested by IPCC (Otto et al., 2013, Shaviv, 2005, Schlesinger et al., 2012). The implications of lower climate sensitivity than the IPCC's estimations are that the future global warming will be slower, allowing humanity more time for gradual adaptation to climate changes. The uncertainty that encompasses current climate change assessments is strengthened in light of the studies indicating that over earth's history there have been distinct warm periods with temperatures exceeding the current ones (Esper et al., 2012, McIntyre and McKittrick, 2003, Soon and Baliunas, 2003). Reviewing the relevant scientific literature, Khandekar, Murty, and Chittibabu (2005) concluded that “in the context of the earth's climate through the last 500 million years, the recent (1975–2000) increase in the earth's mean temperature does not appear to be unusual or unprecedented as claimed by IPCC and many supporters of the global warming hypothesis” (p. 1568). Other studies challenged the mainstream climate change narrative, according to which CO2 levels in the earth's atmosphere play a prominent role in rising temperatures. One notable example is the research by Shaviv and Veizer (2003), which demonstrates that the earth's temperature correlates well with variations in cosmic ray flux, rather than changes in atmospheric CO2. These findings and others stir contentious debates within the climate scientific community, but are nevertheless largely overlooked by the IPCC, which ignores alternative explanations for climate change. Regrettably, Hall et al. scornfully dismiss this evidence, presented in our research note, based on cherry-picking of a few “non-peer-reviewed” references that were cited, some vague claims about “misreading” and “selective citing,” as well as other semantic nitpicking. 4. Impacts of climate change The IPCC warns that climate change is likely to have severe consequences, particularly for poor countries, such as increased hunger, water shortages, vulnerability to extreme weather events and debilitating diseases. However, these estimations have been heavily criticized for failing to properly account for substantial improvements in adaptive capacity (i.e., the capability of coping with the impact of global warming) that are likely to occur due to advances in economic development, technological change and human capital over the next century (Goklany, 2007). Fostering economic growth and technological development, largely achievable through the use of fossil fuels, will strengthen both industrialized and developing countries' adaptive capacity to deal not just with possible future climate change consequences, but also with other environmental and public health problems. Such policy will provide greater benefits at lower costs than drastic climate change mitigation efforts involving substantially cutting greenhouse gas emissions (Goklany, 2004, Goklany, 2012). Furthermore, the analyses of Galiana and Green (2009) exemplify that in the current state of energy technologies, the suggested plans for ambitious emission reductions will likely severely clobber the global economy, especially in view of present economic conditions. In order to stabilize atmospheric CO2 at accepted levels, there is a need for enormous advances in efficient energy technology, which is currently missing (Pielke, Wigley & Green, 2008). In any case, even if every industrialized nation meets the most ambitious emissions targets set by the Kyoto Protocol, such efforts are likely to have little effect, particularly in the light of the considerable increases in greenhouse gas emissions by rising economic superpowers as China and India, as well as the remaining developing world (Wigley, 1998). Hall et al. criticized us for choosing “selective citations…that discuss natural processes potentially affect climate in specific locations and times.” Yet the purpose of referring to such studies was to refute the claims made by the IPCC and other climate change alarmists to the effect that recent extreme weather events (e.g., floods, droughts and storms) are the consequences of anthropogenic emissions of greenhouse gases. Moreover, data shows that despite claims that the number and intensity of extreme weather has increased, between 1900 and 2010 the average annual death and death rates from extreme weather events has declined by 93% and 98%, respectively (Goklany, 2009). This is mostly due to economic and technological factors, such as improved global food production, increase globalized food trade and better disaster preparedness. IPCC's exaggerated estimations of climate change impacts were also noted in an op-ed in Financial Times written by climate economist Richard Tol (2014), a week following his demand that his name as one of the leading authors be removed from the IPCC's AR5 due to its over alarmist assessments of the impacts of AGW and underestimation of humanity's adaptive capacity. As concluded by Tol, “Humans are a tough and adaptable species. People live on the equator and in the Arctic, in the desert and in the rainforest. We survived ice ages with primitive technologies. The idea that climate change poses an existential threat to humankind is laughable” (2014, para 1).

### 1NC---AT: Wenzhou

#### Alt Causes- censorship, torturing, restriction of freedoms, opacity.

Kenneth **Roth 18** {Kenneth Roth is the executive director of Human Rights Watch, one of the world's leading international human rights organizations, which operates in more than 90 countries. 2018. “World Report 2018” https://www.hrw.org/world-report/2018/country-chapters/china-and-tibet}//JM

The broad and sustained offensive on human rights that started after President Xi Jinping took power five years ago showed no sign of abating in 2017. The death of Nobel Peace Prize laureate Liu Xiaobo in a hospital under heavy guard in July highlighted the Chinese government’s deepening contempt for rights. The near future for human rights appears grim, especially as Xi is expected to remain in power at least until 2022. Foreign governments did little in 2017 to push back against China’s worsening rights record at home and abroad. The Chinese government, which already oversees one of the strictest online censorship regimes in the world, limited the provision of censorship circumvention tools and strengthened ideological control over education and mass media in 2017. Schools and state media incessantly tout the supremacy of the Chinese Communist Party, and, increasingly, of President Xi Jinping as “core” leader. Authorities subjected more human rights defenders—including foreigners—to show trials in 2017, airing excerpted forced confessions and court trials on state television and social media. Police ensured the detainees’ compliance by torturing some of them, denying them access to lawyers of their choice, and holding them incommunicado for months. In Xinjiang, a nominally autonomous region with 11 million Turkic Muslim Uyghurs, authorities stepped up mass surveillance and the security presence despite the lack of evidence demonstrating an organized threat. They also adopted new policies denying Uyghurs cultural and religious rights. Hong Kong’s human rights record took a dark turn. Hong Kong courts disqualified four pro-democracy lawmakers in July and jailed three prominent pro-democracy student leaders in August. China’s growing global influence means many of its rights violations now have international implications. In April, security officials at the United Nations headquarters in New York City ejected from the premises Dolkun Isa, an ethnic Uyghur rights activist, who was accredited as a nongovernmental organization (NGO) participant to a forum there; no explanation was provided. In June, the European Union failed for the first time ever to deliver a statement under a standing agenda item at the UN Human Rights Council (UNHRC) regarding country situations requiring the council’s attention. This stemmed from Greece blocking the necessary EU consensus for such an intervention due to its unwillingness to criticize human rights violations in China, with which it has substantial trade ties. Chinese officials continued throughout the year to pressure governments around the world to forcibly return allegedly corrupt mainland officials despite a lack of legal protections in China or refugee status determination procedures outside China. Despite the high costs, many in China continued to fight for rights and justice in 2017. Activists, including those working on women’s, disability, and lesbian, gay, bisexual, and transgender (LGBT) rights, continued to take cases to court to seek limited redress and raise awareness. In a small but significant step, in July a court in Henan province ruled against a public hospital for forcing a gay man to undergo discriminatory “conversion therapy.” In its narrow ruling, the court found that admitting the plaintiff to the hospital against his will violated his rights. Human Rights Defenders The death of Nobel Peace Prize laureate Liu Xiaobo in 2017 laid bare authorities’ ruthlessness towards peaceful proponents of human rights and democracy. In July, after serving nearly nine years of his 11-year prison sentence for “inciting subversion,” Liu Xiaobo died from cancer in a Shenyang hospital, heavily guarded by state security. During his hospitalization, authorities isolated Liu and his wife, Liu Xia, from family and supporters, and denied Liu’s request to seek treatment outside the country. Since Liu’s death, authorities have forcibly disappeared Liu Xia. The government also harassed and detained a group of Liu’s supporters for commemorating his death. In 2017, authorities continued politically motivated prosecutions of human rights activists and lawyers who were rounded up in a nationwide crackdown that began in July 2015. Lawyer Wang Quanzhang and activist Wu Gan remained in police custody, awaiting trial or verdict on baseless charges. In November, lawyer Jiang Tianyong was sentenced to two years in prison on charges of “inciting subversion of state power.” A number of those caught in the “709 crackdown” were freed, but they continue to be closely monitored and isolated from friends and colleagues; some revealed that they were tortured and forced to confess while in detention. Authorities also continued to harass and intimidate the lawyers who represent the detainees, ordering them not to speak to media and disbarring several after giving them failing marks in China’s annual lawyers’ evaluation. In March, a court in Guangdong province, in separate trials, convicted women’s rights activist Su Changlan and online political commentator Chen Qitang on baseless charges of “inciting subversion” and sentenced them to prison terms of three years and four-and-a-half years, respectively. Su was released in October after serving her sentence. Her health deteriorated sharply while in detention due to inadequate medical care and poor conditions in detention. In March, a Sichuan court sentenced artist Chen Yunfei to four years in prison on charges of “picking quarrels and provoking trouble” in connection with his activities commemorating the 1989 Tiananmen Massacre. The government also tried to eliminate the country’s few independent human rights news websites by jailing their founders. In August, a Yunnan court sentenced citizen journalist and protest chronicler Lu Yuyu to four years in prison on charges of “picking quarrels and provoking trouble.” Also in August, authorities charged Liu Feiyue, founder of the website Civil Rights and Livelihood Watch (民生观察) with “leaking state secrets” and “inciting subversion of state power.” Liu could face life imprisonment if convicted. Veteran activist and founder of the human rights website 64 Tianwang, Huang Qi, suffers from kidney disease and has been denied adequate medical care since his detention in November 2016. In August, prominent rights lawyer and activist Gao Zhisheng disappeared from his home in Shaanxi province. Authorities subsequently informed Gao’s family that he had been taken into police custody. China continues to detain non-citizens for promoting human rights in China. In March, Guangdong authorities arbitrarily detained Taiwan democracy activist Lee Ming-che. After holding him incommunicado for six months, denying him access to family, a court in Hunan province sentenced Lee to five years in prison for “subverting state power.” Mainland activist Peng Yuhua, who was tried alongside Lee, was given a seven-year sentence on the same charge. Freedom of Expression Authorities adopted new measures to limit access to circumvention tools that allow netizens to scale the Great Firewall to access the uncensored global internet. In January 2017, the Ministry of Industry and Information Technology issued regulations making it unlawful to provide circumvention tools without the ministry’s pre-approval. In March, Chongqing authorities made public a regulation that bans unauthorized use of internet circumvention tools in the city. Anyone—from individuals to companies—who does so would be ordered to disconnect and receive a warning. The regulation was unprecedented in banning all use of these tools. The same month a Guangdong court sentenced Deng Jiewei to nine months in jail for illegally selling virtual private networks, or VPNs, which protect user privacy by shielding browsing activities from service providers or state surveillance. In July, Apple removed dozens of VPNs from its App store in China, citing compliance with government regulations. In August, the Cyberspace Administration of China (CAC) ordered five websites, including shopping giant Alibaba, to remove vendors that offered access to VPNs. In September, police detained Zhen Jianghua, activist and founder of a website that teaches people how to circumvent internet censorship, on suspicion of “inciting subversion.” In November, in a letter to two US senators, Apple confirmed that it had removed 674 VPNs from its App store in China this year, citing compliance with government regulations. Authorities further tightened screws on social media. In June, they shut down dozens of entertainment news and celebrity gossip social media accounts after calling on internet companies to “actively promote socialist core values” and stop the spread of “vulgar … sentiments.” In August, the CAC announced additional new regulations on the requirement of real-name registration. In September Weibo barred users who had not registered with their real names from posting messages on their own microblogs or comment on others. In September, the CAC promulgated measures to make creators of online chat groups such as those on QQ and Wechat liable for information other users shared in the groups. The rules also require the service providers to establish credit rating systems for chat group users. Those who violate Chinese laws and regulations will have their credit scores lowered. In September, Beijing police arrested Liu Pengfei, the creator of a WeChat group that had discussed political and social issues. Authorities continued their assault on academic freedom. In January, Sun Yat-sen University in Guangzhou banned staff from criticizing the Communist Party. In June, the Central Commission for Discipline Inspection, the party’s disciplinary body, issued a report accusing 14 top universities of ideological infractions after a months-long investigation. Several professors were fired for speaking critically of the Chinese government on social media. In August, Shi Jiepeng, a professor of classical Chinese at Beijing Normal University, was sacked for “improper comments”; Shi had called Mao Zedong a “devil.” In August, Cambridge University Press admitted it had blocked access in China to more than 300 articles published in its journal China Quarterly, following orders from the Chinese government. The international backlash against the decision compelled the publishing house to restore the articles. In November, Springer Nature pulled access to over 1,000 articles in China. The publisher said the decision was to comply with Chinese regulations. In March, authorities issued new measures to reduce the number of foreign children’s titles published in Chinese. In August, the Ministry of Education issued new national editions of primary and middle school liberal arts textbooks, with added emphasis on traditional culture and “core socialist values.” Gui Minhai, a Swedish national and publisher of books critical of the Chinese leadership, was abducted in Thailand in October 2015. After holding Gui for two years in secret detention in China, the Chinese government in October told Swedish diplomats that Gui had been “released.” Hong Kong Civil liberties in Hong Kong are increasingly being undermined by the growing interference of the central government, 20 years after the city returned to Chinese sovereignty in 1997. Opposition political parties and their supporters faced greater harassment from authorities. In April, the Companies Registry rejected the application of the Hong Kong National Party on grounds that the promotion of “Hong Kong independence is against the Basic Law.” During President Xi’s visit to Hong Kong, local and mainland police followed, harassed, and arrested some peaceful pro-democracy protesters. In April, Hong Kong police arrested 11 pro-democracy advocates on charges including “unlawful assembly” and “obstructing police.” The charges stem from the advocates’ protest against a decision by China’s top legislative body forcing Hong Kong courts to disqualify two pro-independence legislators. In July, a Hong Kong court disqualified four more pro-democracy lawmakers for modifying their oaths swearing allegiance to China in a 2016 ceremony. In March, two mainland government advisers said the central government will rely more on “legal means”—suggesting manipulation of the territory’s legal system—to strengthen central control. In April, the chief of legal affairs at the China Liaison Office in Hong Kong said the “one country, two systems” principle could be abolished altogether if the city “fails to actively defend the sovereignty” of China. In June mainland officials declared that the Sino-British Joint Declaration, which states that Hong Kong enjoys “a high degree of autonomy” except in foreign affairs and defense, “no longer has any realistic meaning.” In August, a Hong Kong appeals court sentenced pro-democracy student leaders Alex Chow, Nathan Law, and Joshua Wong to six to eight months in prison. The three had earlier been convicted of crimes related to “unlawful assembly” for peaceful protests at the time of the 2014 Umbrella Movement, and were given community sentences by a lower court. In a politically motivated move, the secretary of justice, a political appointee, sought a harsher prison sentence for the trio. Also in August, the same court convicted 13 defendants of unlawful assembly for another anti-government protest in 2014. The 13, who had previously been sentenced to community service, were given prison terms of between 8 and 13 months after the Justice Department sought a review of their sentences. In October, the Court of Final Appeal released Chow, Law, and Wong on bail, pending appeal. Xinjiang The Chinese government has long conflated peaceful activism with violence in Xinjiang, and has treated many expressions of Uyghur identity, including language and religion, as threatening. Uyghur opposition to government policies has been expressed in peaceful protests but also through violent attacks. However, details about protests and violence are scant, as authorities severely curtail independent reporting in the region. In 2017, the Chinese government continued its 2014 “strike-hard” campaign in Xinjiang, which vowed to adopt “unconventional tactics” in countering terrorism. After Party Secretary Chen Quanguo was transferred from Tibet to Xinjiang in August 2016, the Xinjiang regional government expanded its already pervasive security measures by hiring thousands more security personnel. In July, authorities forced residents in a district of Urumqi, the capital city of Xinjiang, to install surveillance apps on their mobile phones. In 2017, the Xinjiang government also waged a campaign against “two faced” Uyghur cadres thought to oppose the party’s stance on Uyghurs. In April, 97 officials in Hotan prefecture were reprimanded. Authorities increasingly restricted and punished Uyghurs’ foreign ties. Since October 2016, authorities have arbitrarily recalled passports from residents of Xinjiang. Since about April, 2017 authorities have arbitrarily detained thousands of Uyghurs and other Muslims in centers where they were forced to undergo “patriotic education.” Authorities also ordered Uyghur students studying abroad, including in Egypt, to return to Xinjiang; and in July, Egyptian authorities rounded up those who had failed to return, possibly at China’s behest. By September, about 20 Uyghurs were forcibly repatriated to Xinjiang while 12 were released. Some of those who returned were detained; a Xinjiang court sentenced Islamic scholar Hebibulla Tohti to 10 years in prison after he returned with a doctorate degree from Egypt’s Al-Azhar University. In February, a video believed to be released by the extremist group Islamic State (also known as ISIS) showed Uyghur fighters who pledged to return to China and “shed blood like rivers”—the first reported direct threat by the group against Chinese targets. A 2016 study reported that at least 114 Uyghurs had joined ISIS, but estimates vary widely and the level of participation remains unconfirmed. In April, the Xinjiang Counter-Extremism Regulations, which prohibit the wearing of “abnormal” beards or veils in public places, became effective. Also in April, Xinjiang authorities issued a new rule banning parents from naming children with dozens of names with religious connotations, such as Saddam and Medina, on the basis that they could “exaggerate religious fervor.” Tibet Authorities in Tibetan areas continue to severely restrict religious freedom, speech, movement, and assembly, and fail to redress popular concerns about mining and land grabs by local officials, which often involve intimidation and arbitrary violence by security forces. In 2017, officials intensified surveillance of online and phone communications. Six UN special rapporteurs sent a communication to the government of China expressing concern about the late 2016 mass expulsion of monastics (monks and nuns) and demolition of living quarters at the Larung Gar monastery in Kandze, Sichuan. Similar expulsions and demolitions were reported at the Yachen Gar monastery in Kandze in August 2017. Several thousand Tibetans traveling on Chinese passports to India for a January 2017 teaching by the Dalai Lama were forced to return early when officials in Tibetan areas attempted to confiscate passports, threatening retaliation against those travelling abroad and their family members back home. In June, residents of Palyul county, Sichuan, demonstrated against land grabs; in July and August, Qinghai residents peacefully protested against several official policies. One solo protest in central Lhasa on June 23 ended in the protester’s suicide. Between October 2016 and March 2017, there were at least six protests in Ngaba, Sichuan, alone, but details are scant due to extreme surveillance and intimidation. Tibetans continue to self-immolate to protest Chinese policies. At time of writing, four had done so in 2017. Freedom of Religion The government restricts religious practice to five officially recognized religions in officially approved religious premises. Authorities retain control over religious bodies’ personnel appointments, publications, finances, and seminary applications. The government classifies many religious groups outside its control as “evil cults,” and subjects members to police harassment, torture, arbitrary detention, and imprisonment. In February 2017, Beijing police detained Sun Qian, a businesswoman and Canadian citizen, on suspicion of “using cults to sabotage law enforcement.” Sun is a follower of the Falun Gong, a meditation-focused spiritual group banned since 1999. Sun was reportedly pepper-sprayed, put in handcuffs attached to foot shackles, and deprived of sleep. In May, authorities detained Shao Zhumin, a Catholic bishop of an underground church in Wenzhou, Zhejiang province. Shao’s church had refused to join the state-affiliated Chinese Catholic Patriotic Association. Beijing and the Vatican have continued negotiations on the normalization of diplomatic ties, but the dialogue remains strained by disputes over who has authority to appoint bishops in the country. In September, China passed revisions to the 2005 Regulations on Religious Affairs. The document, which comes into effect in February 2018, introduces new restrictions designed to “curb extremism” and “resist infiltration,” including banning unauthorized teaching about religion and going abroad to take part in training or meetings. Donations from foreign groups or individuals that are over 100,000 RMB (US$15,000) are also prohibited. The new rules also expand the role of local authorities in controlling religious activities. Authorities in Yunnan province charged more than a dozen Christians in 2017 with “using cults to sabotage law enforcement.” In October, at least three of the charged were given prison sentences of four years. One of their lawyers said the arrests were due to the group not gathering at officially designated churches. Women’s and Girls’ Rights According to a report by World Economic Forum, China ranked 100th out of 144 countries for gender parity in 2017, falling for the ninth consecutive year since 2008, when it ranked 57th. The Party Congress, concluded in October, was marked by a striking absence of women in top political posts. Women and girls in China continue to confront sexual abuse and harassment, employment discrimination, and domestic violence. The Chinese government remains hostile to women’s rights activism. In February, internet company Sina suspended the microblog of Women’s Voices, run by outspoken feminists, for 30 days. Between May and June, Guangzhou police forced five activists from their homes in retaliation for their campaign to raise awareness about sexual harassment on public transportation. In September, authorities finally lifted a 10-year travel ban on activist Wu Rongrong, enabling her to travel to Hong Kong for studies. Disability Rights China ratified the Convention on the Rights of Persons with Disabilities in 2008. However, persons with disabilities continue to face discrimination in areas including education and employment. In February, authorities released long-awaited Regulations of Education of Persons with Disabilities to replace out-of-date 1994 regulations. While the new regulations have some positive aspects, they do not go far enough in removing discriminatory obstacles that prevent many children with disabilities from being placed in mainstream schools. They require that students with disabilities be evaluated by a quasi-governmental expert committee and placed according to their “physical conditions and ability to be educated and adapt to [mainstream] schools.” Preventing children with disabilities from attending mainstream schools, or failing to provide them with support needed to attend such schools, is itself a violation of the CRPD. In March, state press reported the death of a 15-year-old with autism in a Guangdong “care center” for the homeless, focusing attention on neglect in these facilities. In a welcome move in April, the Ministry of Education issued a new rule to accommodate students with disabilities in college entrance exams, known as gaokao. While a 2014 decision already required schools to provide people with visual impairments access to braille or electronic paper in gaokao exams, the new rule provides more details on implementation and includes accommodation for people with other disabilities, including for deaf students. Sexual Orientation and Gender Identity While China de-criminalized homosexuality in 1997, it lacks laws protecting people from discrimination on the basis of sexual orientation or gender identity, and same-sex partnership is not legal. In May, Chinese authorities shut down a popular dating app for lesbians. In June, the government banned “abnormal sexual lifestyles,” including homosexuality, from online video programs. In July, authorities forced the LGBT group Speak Out to cancel a conference in Chengdu. An earlier Speak Out event scheduled for May in Xi’an was also cancelled after police briefly detained the organizers and told them that LGBT events were “not welcome” in the city. Refugees and Asylum Seekers Beijing also appeared to step up its campaign to forcibly return North Korean refugees and asylum seekers in 2017: between July and August, 41 people were detained; 51 had been detained in all of 2016. Key International Actors While the European Parliament, United States Congress, the UN High Commissioner for Human Rights, and individual members of governments and parliaments publicly expressed some concern about the deteriorating human rights situation in China in 2017, the response of “like-minded” governments to negative developments, such as jail sentences for peaceful protestors in Hong Kong, was even more muted than in previous years. Although the United States delivered a joint statement on behalf of a dozen countries at the March 2016 session of the UNHRC expressing concern at human rights violations in China, it did not present a follow-up joint statement at any of the council’s 2017 sessions. In January 2017, UN Secretary-General Antonio Guterres introduced President Xi at an event closed to civil society at the Palais des Nations in Geneva. Guterres made no reference to China’s deteriorating human rights environment or to human rights as a pillar of UN work. At a summit in Brussels on June 1-2, the EU Council and Commission presidents publicly “expressed concern” about human rights abuses in China, but did not call for the release of political prisoners, including EU citizens, or the repeal of abusive laws. The EU did raise concerns about China at the UNHRC in September. In June, German Chancellor Angela Merkel publicly challenged Chinese authorities to fulfill their commitments to register German NGOs under China’s new Foreign NGO Management Law, which went into effect in 2017. Also in June, Italian police briefly detained and later released Dolkun Isa, a prominent Uyghur activist and German citizen, as he tried to enter the Italian Senate, where he had been invited to speak. Italian authorities refused to clarify whether China had requested Isa’s detention. Australia failed to ratify an extradition treaty with China after protests from Australian politicians arguing Australia should not send people to China because the country's judicial system is plagued with human rights abuses. Businessmen linked to China’s government have made significant foreign donations to political parties in Australia, raising concerns about Chinese attempts to influence Australian policy. An Australian parliamentary inquiry in March called for a ban on political donations from foreign sources, and the government ordered a review of espionage laws. In July, the United States issued several statements condemning China’s failure to allow Liu Xiaobo the freedom to seek medical treatment wherever he chose. Yet within hours of Liu’s death US President Donald Trump referred to President Xi as a “terrific guy” and “a great leader.” Foreign Policy In May, China hosted its largest-ever gathering for the “One Belt, One Road” (OBOR) initiative, a development program spanning 65 countries that China says will involve investments of more than $1 trillion. Many participating states have a history of countenancing serious human rights violations in major development and infrastructure projects. Key international financial institutions, including the Asian Development Bank, the Asian Infrastructure Investment Bank, and the World Bank, have not taken adequate steps to ensure that they place strong human rights conditions on any participation in OBOR-related projects. At the UN Security Council, China joined Russia in February in a double veto of a resolution that would have imposed sanctions related to use of chemical weapons in Syria. In September, the council held closed-door discussions on Burmese military atrocities against Burma’s Rohingya Muslim minority; diplomats said China opposed language recognizing the right of return of the more than 630,000 Rohingya refugees who fled to Bangladesh. While senior UN officials described the military campaign as “ethnic cleansing,” Chinese state media endorsed it as a firm response to “Islamic terrorists.”

#### No impact to democracy

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The U.S. government should cease its arrogant and ill-informed attempts to promote democracy around the globe — whether in Cuba, Iraq, Afghanistan, Communist China, Ukraine, Burma or otherwise. The attempts are extraneous to the purposes of the United States Constitution. Democratically elected leaders can be every bit as tyrannical and aggressive towards the United States as unelected dictators. Hamas, listed as an international terrorist organization, decisively triumphed in Palestinian parliamentary elections in 2006. It has ruled in Gaza since 2007, routinely denies human rights, chronically attacks Israel, and execrates the United States. Egypt’s first democratically elected president, Mohamed Morsi, proved as much or more contemptuous of the rule of law, human rights and amity towards Israel and the United States than his dictatorial predecessor, Hosni Mubarak. Thus, the United States shed only crocodile tears when he was overthrown in a military coup. Adolf Hitler climbed to power through popular elections. His Nationalist Socialists captured more than 37 percent of the vote in 1932 to become the largest party in the Reichstag. Free and fair elections in Saudi Arabia would yield victory for radical Islamic parties with affinity and sympathy for the murderous perpetrators of 9/11. In sum, promoting democracy in foreign lands may aggravate rather than diminish threats to perceived interests of the United States. Thus, we have supported dictators over democrats in Iran, Guatemala, Chile, Indonesia, Argentina, Bahrain, Kuwait, Cambodia, Brazil, the Democratic Republic of Congo, Spain, the Philippines, ad infinitum. In any event, democracy promotion is overwhelmingly a fool’s errand. The process is vastly too complex for us to master or to jump start. Sending nations copies of the Declaration of Independence and Constitution will not do. Words without a reinforcing political culture are worthless. Iraq’s Constitution prohibits laws that contradict the “principles of democracy.” But Salmon Rushdie would be killed if he attempted to sell The Satanic Verses in Baghdad. We also forget that democracy in the United States evolved over more than seven centuries. We cannot expect more from other people. Anglo-American democracy was born with the Magna Carta to check the absolutism of King John in 1215 on the fields of Runnymede. Through succeeding centuries and periodic civil wars, the powers of Parliament strengthened and the powers of the King diminished. Landmarks included the Grand Remonstrance, the beheading of Charles I by Oliver Cromwell, and the English Bill of Rights of 1688. American colonists claimed the rights of British freemen. They soon took on the trappings of democracy with the Virginia House of Burgesses, the Mayflower Compact, the Connecticut Charter Oak, the Maryland Toleration Act, etc. The United States Constitution was not drafted until 1787, more than five centuries after Magna Carta. Democratic principles did not completely triumph until the Civil War Amendments ending slavery and enfranchising blacks, and the Women’s Suffrage Amendment ending their disenfranchisement in 1919. Blacks did not de facto enjoy the right to vote until the Voting Rights Act of 1965, more seven and one-half centuries since the road to democracy began at Runnymede. It was facilitated in the United States by a literate society, a homogeneity of ethnicity, culture and language, natural boundaries, and an unprecedented array of profound and selfless leaders, for example, George Washington and James Madison. Despite these vast advantages, the United States still needed a bloody Civil War and an obscenely prolonged period of Jim Crow before finally achieving substantial national unity and racial justice. In light of our own seven-century journey to democracy, the idea that we can install democratic dispensations in nations that are at the pre-Magna Carta stage of political maturity and lacking our peculiar cultural advantages is delusional. Our miserable track record speaks for itself, including South Vietnam, Iran, Iraq, Afghanistan, Pakistan, Egypt, Burma, South Sudan, Somalia, Syria, and Bahrain. Taiwan moved into a democratic orbit in 1988 after the deaths of dictators Chiang Kai-shek and his son Chiang Ching-kuo, and South Korea did the same after military strongman Chun Doo Hwan left office. But these democratic movements were indigenous. The United States was complacent with reliable, friendly, and anti-democratic leadership. At best, democracy promotion is harmless — like shouting at the weather. At worst, it is counterproductive. Many societies are insufficiently mature, literate, and homogeneous to for its practice. Democracy in these places degenerates into majoritarian, sectarian, or tribal tyrannies notwithstanding formal elections. Russia, Iraq, Syria, Libya, and South Sudan are emblematic. Democracy is given a bad name, which may handicap its return at a more propitious time. Our energies should be devoted to purging the evils from our own democracy. We should then be satisfied with influencing developments abroad by example, simpliciter.