Facts & Findings

KONRAD
ADENAUER
STIFTUNG

Artificial Intelligence, 5G and the Future Balance of Power

Benjamin Fricke

› Artificial Intelligence (AI) and 5G will become the most important emerging technologies within the next 10–20 years with the potential to fundamentally alter the global balance of power. They will most probably propel the 4th Industrial Revolution.

› Geopolitical and economic supremacy will be determined by those powers who manage AI and 5G to their advantage. Russia and China are challenging the U.S.-led world order by a new technological competition in economics, military modernization and means of social control that capitalize on the advancements that these technologies provide.

› Germany and the EU are lagging behind in both 5G and AI adaptation. Their global competitiveness will continue to decline unless they invest in EU-based, technology-capable companies that can manage big data and exploit the seemingly limitless opportunities such data offers.

www.kas.de

Table of Contents

Introduction

Artificial Intelligence (AI), understood narrowly as computer algorithms that process big data to the point where machines can "learn" on their own, is becoming one of the most defining technological developments of the 21st century. The next industrial revolution triggered by AI and enabled by 5G will profoundly change our human interactions. 5G enables exponentially faster download and upload speeds, as well as it provides significantly reduced latency for numerous devices, while allowing wireless networks to communicate with each other. Whether one considers production supply chains, transportation systems (self-driving cars), medical technology breakthroughs (remote surgeries), social control mechanisms or the way modern-day warfare is conducted – these are all areas in which AI-enabled technology will change our existence. 5G will become the basis of a new global communications architecture on which to apply AI in the broadest way and where the Internet of Everything (IoE) will become the backbone of our societies.[1] Unless we implement 5G networks that we can influence or control by keeping this critical technology in trusted hands, we will face the dire consequences of powerful adversaries threatening our values, ethics, social, economic and national security.

> The next industrial revolution triggered by AI and enabled by 5G will profoundly change our human interactions.

This change in technological modernization is not without challenges and consequences for the U.S.-led world order that has endured for the last 75 years. China has documented explicitly that by 2049 it plans to become the world's premier global superpower, thus surpassing the United States.[2] China's modern information and communications technologies (5G, AI and Quantum computing) will enable the Communist Party of China (CCP) and People´s Liberation Army (PLA) to monitor and control not only their own, but other countries' societies, industries and governments. And this will be done by digital means in areas that were previously managed physically, such as by law enforcement personnel, military forces, or border control and facilities.

> The change in technological modernization is not without challenges and consequences for the U.S.-led world order that has endured for the last 75 years.

Global Power Competition in Technology

Russian President Vladimir Putin stated on September 1, 2017, during a meeting with students in Yaroslavl, Russia, that whoever controls Artificial Intelligence will control the world.[3] This assessment must be understood as a continuation of traditional warfare. It is important to realize that the ultimate goal of a respective regime or government – whether economic, geopolitical or societal, will be reflected by the way AI is used as a tool of governance or statecraft and must be understood through the perspective of intention. The application of AI as a tool of warfare clearly can be seen as a *continuation of politics by digital means.* Thus, AI must be viewed not only as the key component of the 4th Industrial Revolution but also as a revolution in warfare, which is commonly referred to as a "revolution in military affairs – RMA".[4] Just as the bow and arrow were replaced by gunpowder and guns, AI will forever change how warfare is conducted.

> The application of AI as a tool of warfare clearly can be seen as a continuation of politics by digital means.

We are now witnessing a new Great Power Competition, not only in a technical revolution of military affairs, but also in the wider geopolitics of technology.[5] The traditional global presence of the United States was guaranteed by treaty-based alliances and an international network of military bases and personnel. The U.S. ability to intervene at any place or time guaranteed the Pax Americana that, since World War II, has brought a liberal political and economic order to Europe, lasting peace and the end of the Cold War. This Western, rules-based, liberal-democratic political order, which dominated much of the second half of the 20th century is now increasingly in question.[6] On the one hand, Russia is actively trying to regain political influence and territory, as well as applying concerted efforts to destabilize regions by fostering protracted conflicts, such as in Ukraine, Georgia and Syria, through its aggressive behavior in the cyber domain.[7] On the other hand, China, specifically the CCP, has managed to retain almost absolute power over its people despite the international collapse of the communist world in 1989/90. Unlike Russia, China has managed to modernize rapidly by combining its Leninist political system with a controlled, partly capitalist-style economy – a system known as "Socialism with Chinese Characteristics"[8], or, "State Capitalism".[9]

Due to the Chinese embracing some aspects of markets and profits, the prolific and systemic theft of intellectual property (IP) worldwide,[10] decade long knowledge transfer due to outsourcing and the extraordinary hard work of individual Chinese, hundreds of millions of Chinese have achieved middle class status or better. This transformation appears to many as a counter-model to the U.S. guaranteed liberal-democratic western world order. The centrally governed Chinese system seems to provide prosperity and economic mobility without the often highly demanding and compromise seeking democratic structures of the West. Both Russia and China are aggressively pursuing leadership in AI technologies that will facilitate their goals to expand their political influence and economic power towards the USA, EU and the greater geopolitical landscape in the 21st century.[11]

AI is key to the control of geographic space and the five dimensions (land, sea, air, space and cyber) of warfare and their interoperability. China's Hundred-Year Marathon[12] is aimed at replacing the U.S.-led world order with alternative economic and digital networks, while simultaneously building up a military presence in places such as the South China Sea and the Indo-Pacific.[13] Essentially, China is effectively combining both geopolitical theorists Alfred Thayer Mahan and Halford Mackinder into one national global strategy; sea power vs. land power.

Several examples support this observation. China has been working on AI enabled tanks and drones for several years. On October 1, 2019 during China's National Day parade, the new unmanned combat air vehicle (UCAV) **"Gonhji 11"** was first displayed to the public.[14] While little is known about the specifics of this technology, it is reasonable to assume that this drone shares some qualities with its global counterparts of the same size and role. Moreover, the **Gonhji 11** has inherent stealth characteristics which enable it to covertly enter an enemy's airspace and take out targets of tactical and strategic importance. The CCP is also seeking to update a large number of Type 59 tanks as unmanned ground vehicles commanded remotely.[15] China clearly understands the considerable application of AI technology in a dual use – that is, if it works in civil life such as in autonomous cars, it can be applied to military use such as in autonomous tanks. Chinese President Xi Jinping announced further investments in aircraft carriers, stealth bombers and rockets; presumably all will be AI-enhanced. It has become China's goal not only to educate AI specialists and invest in Chinese universities and laboratories, but also to take advantage of other country's education systems and to recruit qualified specialists from throughout the world and offer them opportunities to work in China,[16] or exfiltrate targeted knowledge by any means possible. This and other similar national "recruiting" initiatives were put forth in China's **"Thousand Talents"** plan established in 2008.[17]

We are now witnessing a new Great Power Competition, not only in a technical revolution of military affairs, but also in the wider geopolitics of technology.

China clearly understands the considerable application of AI technology in a dual use – that is, if it works in civil life such as in autonomous cars, it can be applied to military use such as in autonomous tanks.

Chinese military capabilities, while still not matching those of the U.S., are visibly, dramatically and rapidly improving. Yet, where China is making real progress albeit less visible – is in building up key digital infrastructure projects globally. For example, since 2005 China's Huawei became the main telecommunications equipment provider for British Telecom's 21st Century Network[18] and today is the largest telecom provider in the world, and has implemented or put bids forward to almost 60 countries to build-out the regional components of a globalized 5G network – the backbone of Artificial Intelligence and future deep machine learning (DML) technologies.[19]

China is also investing heavily in neuroscience research that closely parallels advances in AI. Some Chinese schools, for example, are already using brain wave sensing gadgets with a method called "electroencephalography" (EEG).[20] This is an electrophysiological monitoring method that records electrical activity of the brain. Parents and teachers can observe in real time, the attentiveness of an individual child and take actions if necessary. This technology not only allows for greater social monitoring, control and disciplining, whether in school or combat, but it also paves the way for neural interface technology that would translate thoughts into action by machines.[21]

At the same time, Russia is highlighting the importance of AI for the future, be it in the military or the economy. Many have likened it to a new "Sputnik moment".[22] The Russian approach, in contrast to the Chinese, is more focused on the military applications of AI. It is developing and will soon deploy cruise missiles capable of redirecting themselves after "noticing" that the primary target has already been destroyed. Russia not only has announced the development and production of the Avangard (a hypersonic glide vehicle) capable of actively avoiding radar and point defense system detection and delivering nuclear and conventional payloads, but also it has developed a nuclear-powered cruise missile called 9M730 Burevestnik, capable of carrying thermonuclear warheads.[23] The Russian Federation is working on AI to create swarms of drones ready to be used on the battlefields of the future. Unmanned vehicles have been almost exclusively used in the air, but now the Russian military wants to bring unmanned and fully armed vehicles to the ground. The Russian military purportedly plans to adopt the Nerekhta unmanned ground vehicle (UGV) as a utility platform, capable of supporting and transporting troops, launching anti-tank weapons and supporting artillery systems.[24] Undoubtedly, Russia is taking bold steps when it comes to the weaponization and militarization of AI, and responsible for new developments is the Kronstadt Group.[25]

AI and the Future of Warfare

The main cyber and AI players today are the United States, Russia, China, and to a lesser extent, the European Union. Large tech companies however are mainly located in the United States and China, while Russia is primarily focused on military and government efforts. Technologically, the EU lags them all.[26]

When one thinks about warfare and artificial intelligence, one often thinks of the movies *The Terminator* and *Matrix*. These bleak and doomed futures for mankind may give us an imaginary taste of what the evolution of technology may bring. While these scenarios are thankfully still science fiction, the need to comprehend the new challenges that come with warfare in a world of AI is imminent. In February 2017, the Pentagon concluded that deep-learning algorithms "can perform at near-human levels".[27] Like any technology, AI presents opportunities and challenges. AI can help overcome geography and provide digitally enhanced capabilities such as medical support and weather analysis for successfully growing crops.[28] Yet it

China is making real progress albeit less visible – is building up key digital infrastructure projects globally.

The Russian approach, in contrast to the Chinese, is more focused on the military applications of AI.

The Pentagon concluded that deep-learning algorithms "can perform at near-human levels".

can also be abused – cripple or destroy components of a country's critical infrastructure and manipulate our highly-digitalized societies. As a tool of warfare, AI will give those who are well prepared an upper hand – to analyze, label and use the massive amounts of big data more efficiently and effectively. This data will then enable one to *"know one's enemy as well as one knows oneself"* and gain the competitive advantage in an AI dominated world. A small glimpse into how the future of modern warfare may look is the well-known case of Stuxnet – the first cyber weapon used and believed to have done severe, but only temporary damage to parts of the Iranian nuclear weapons program.[29]

Lastly, another technological advancement in parallel to AI is Quantum Computing. Quantum Computing will change AI by allowing for faster, massive and extremely complex computing power.[30] Applying the principles of quantum physics holds unprecedented potential for a global Quantum Computing network. For example, the flow of data will dramatically be improved-from better message encryption, or breaking any encryption, to the design and analysis of molecules and teleportation of information. In 2019, Austrian and Chinese researchers achieved the teleportation on a quantum state of a photon to a distant one.[31]

> Quantum Computing will change AI by allowing for faster, massive and extremely complex computing power.

Germany's Approach and Shortcomings

While the current three global AI players, the United States, China and Russia are actively using big data for social and military advantages, Germany's AI strategy is more economic and trade based.[32] For the country's current economic and political structure this approach is the path of least resistance in terms of how to interact with the other (aforementioned) big players, yet it also ensures Germany will once again face familiar geopolitical problems as it did in the pre-AI world. Who will guarantee the liberal world order and maintain the freedom of ideas, markets, capital and innovation to enable Germany's well-functioning AI-based economy to continue to export? The question of resiliency and self-defense will remain tied to the current question over Germany's NATO defense spending, which is supposed to be, but is not, at two percent.[33] Will Germany also fall massively short in an AI world in terms of carrying its fair share for the future of democracy? And does the nature of AI, where security and economy are even more intimately related than before, permit that?

> Germany's AI strategy is primarily economic and trade based.

It is essential that Germany and the EU are drivers in building up their own 5G and AI capable companies, or that it has truly trusted technology partners and suppliers. A dependence on one single supplier is not a feasible solution for a high-tech economy such as Germany's. Besides national security interests, it is also a question of economic security to have an open component network, in which individual devices can easily be replaced with another company's products. Those products must however be trusted. All in all, Germany and Europe at large are in a fairly good position when it comes to high level AI research,[34] but the application of AI is often hampered by very restricted privacy laws, which make big data difficult to access.[35]

Solutions to 5G and AI Monopolies

Yet, the point at which an independent national 5G network can be built seems to have already passed. The small number of companies capable of producing 5G technologies suggests a highly-competitive international market for this technology with significant barriers to entry. Only nine companies sell 5G radio hardware and 5G systems for carriers: Altiostar, Cisco Systems, Datang Telecom, Ericsson, Huawei, Nokia, Qualcomm, Samsung and ZTE.[36] Since no national provider is able to handle 5G technology for everywhere, it is ever more

> The point at which an independent national 5G network can be built seems to have already passed.

important to enable competition and an open component based system. As malware, spyware and back door manipulation software can be uploaded with any new software update, the ability to replace a single hardware component of a different company that is compatible, reliable and secure is essential. This would require international standards and norms that have yet to be established. Just as international trade standards were established with the World Trade Organization (WTO), perhaps a Cyber and Artificial Intelligence Organization (CAIO) should focus on establishing international regulations, standards and fair rules for the evolving digital economy. Yet, as China flouted the WTO,[37] it is questionable if a CAIO could truly be enforced?

National and regional players, such as Germany and the EU could start forming a more independent industry and build up AI capabilities at home. Alternative markets should also be tapped, namely South and East Asia, Africa or South America. Nonetheless, it remains in the national interest from an economic and defense point of view to support competition in this field and to establish regulation of anti-trust laws regarding 5G technologies and AI. Moreover, real consequences and enforcement mechanisms for non-compliance must be applied, as for example market access denial or black-listing of companies.

As mentioned, the critical importance of developing a competitive AI industry is not only an economic necessity to secure a nation's economic welfare and a society´s open character, but it is also a critical question of maintaining national security. Firstly, AI has the potential to shift the global balance of power profoundly and it will reshape the way we conduct modern warfare. Nation states will need to adopt new tools of cyber statecraft which will include regularly updated AI tactics, techniques and procedures. 5G and the development of Artificial Intelligence will determine economic and warfare superiority in the next 10–20 years to come. Secondly, Russia and China are challenging the U.S.-led world order by a new technological competition in economics, military modernization and means of social control. Thirdly, Germany´s and the EU´s global competitiveness will continue to decline unless both invest in EU-based, technology-capable companies that can manage big data and exploit the seemingly limitless opportunities such data offers. The incorporation of AI and other key emerging information and communications technologies will be a critical defining factor for the success of nation states and alliances in the future.

National and regional players, such as Germany and the EU could start forming a more independent industry and build up AI capabilities at home.

1   IoE (Internet of Everything), IT-Wissen, https://www.itwissen.info/IoE-Internet-of-everything.html, published March 07, 2018, Access November 13, 2019.

2   Jason Lee, The World Is Too Important to Be Left to America. A Chinese Bestseller charting a path for global dominance appears in English for the first time, The Atlantic, https://www.theatlantic.com/international/ar-chive/2015/06/china-dream-liu-mingfu-power/394748/, published June 4, 2015, Access November 13, 2019.

3   Vladimir Putin warns whoever cracks artificial intelligence will 'rule the world', Daily mail, https://www.dailymail.co.uk/sciencetech/article-4844322/Putin-Leader-artificial-intelligence-rule-world.html, published September 1, 2017, Access November 14, 2019.

4   Dan Goure, The Next Revolution In Military Affairs: How America's Military Will Dominate. And China and Russia won't like it one bit, The National Interest, https://nationalinterest.org/blog/the-buzz/the-next-revolution-military-affairs-how-americas-military-23833, published December 28, 2017, Access November 14, 2019.

5   For further reading on individual countries the three part study by Dr. Olaf J. Groth/Dr. Mark Nitzberg/Dan Zehr, Comparison of National Strategies to Promote Artificial Intelligence, published by the Konrad-Adenauer-Stiftung, published 2019.

6   Michael Stürmer, Die Pax Americana ist am Ende – und Europa ignoriert das, Welt, https://www.welt.de/debatte/kommentare/article6072680/Die-Pax-Americana-ist-am-Ende-und-Europa-ignoriert-das.html, published August 8, 2008, Access November 14, 2019.

7   Stephen Blank, Cyber War and Information War à la Russe, in: Understanding Cyber Conflict: Fourteen Analogies, by George Perkovich/Ariel E. Levite, Georgetown University Press, 2017, p. 82.

8   Ian Buruma, The Tenacity of Chinese Communism. How the party revived an ancient philosophy to extol order and compel obedience, New York Times, https://www.nytimes.com/2019/09/28/opinion/sunday/china-communist-party-confucianism-70-anniversary.html, published September 28, 2019, Access November 14, 2019.

9   Rainer Zitelmann, State Capitalism? No, The Private Sector Was And Is The Main Driver Of China's Economic Growth, https://www.forbes.com/sites/rainerzitelmann/2019/09/30/state-capitalism-no-the-private-sector-was-and-is-the-main-driver-of-chinas-economic-growth/#7a134fa227cb, published September 30, 2019, Access November 14, 2019.

10   Eric Rosenbaum, in 5 corporations say China has stolen their IP within the last year: CNBC CFO survey, https://www.cnbc.com/2019/02/28/1-in-5-companies-say-china-stole-their-ip-within-the-last-year-cnbc.html, published March 1, 2019, Access November 14, 2019.

11   AI Trends Staff, Geopolitics Between US and China on AI Shaping Up as "Algorithmic War", aitrendes. The Business and Technology of Enterprise AI, https://www.aitrends.com/ai-national-initiatives/geopolitics-between-us-and-china-on-ai-shaping-up-as-algorithmic-war/, published August 22, 2019, Access November 15, 2019.

12   See for recommendation, Michael Pillsbury, The Hundred-Year Marathon. China's Secret Strategy To Replace America As The Global Superpower, Griffin Publishing, California 2016.

13   Ibid.

14   Staff Writer, Gongji-11 (GJ-11). Stealth Unm,anned Combat Aerial Vehicle (UCAV) – The Gonji-11 is the latest UCAV to enter the Chinese military inventory – boasting stealth features and an advanced overall design, The Military Factory, https://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=2219, published February 2, 2019, Access November 15, 2019.

15   N.n., China testet erste KI-fähige Drohnen-Panzer. Mit Hilfe von künstlicher Intelligenz will China eine große Anzahl an Panzern in unbemannte Fahrzeuge umbauen, Handelsblatt, https://www.handelsblatt.com/politik/international/militaer-china-testet-erste-ki-faehige-drohnen-panzer/21094814.html?ticket=ST-24503503-ujGUokfsEGTGcbB0tYFV-ap4, published March 21, 2018, Access November 15, 2019.

16   Ibid.

17   N.n., China Innovation Funding, Thousand Talents Plan, http://chinainnovationfunding.eu/thousand-talents-plan/, published 2008, Access November 16, 2019.

18   Juliette Garside, Huawei's relationship with BT under investigation by MPs. Chinses telecom firm facing international blacklisting after Australia, the US, Canada take action, The Guardian, https://www.theguardian.com/technology/2012/oct/10/huawei-international-blacklisting, published October 10, 2012, Access November 16, 2019.

19   Ben Yu, The convergence of 5G and AI: A venture capitalist's view, Venturebeat, https://venturebeat.com/2019/03/31/the-convergence-of-5g-and-ai-a-venture-capitalists-view/, published March 31, 2019, Access November 16, 2019.

20   Chrystal Tai, Under AIÄ's Watchful Eye, China Wants to Raise Smarter Students, WSJ, https://www.wsj.com/video/under-ais-watchful-eye-china-wants-to-raise-smarter-students/C4294BAB-A76B-4569-8D09-32E9F2B62D19.html, published September 19, 2019, Access November 16, 2019, Section 1:57 min to 2:56 min.

21   Emil Protalinski, Ctrl-labs CEO: We'll have neural interfaces in less than 5 years, Venturebeat, https://venturebeat.com/2019/11/20/ctrl-labs-ceo-well-have-neural-interfaces-in-less-than-5-years/, published November 20, 2019, Access November 16, 2019.

22   Zachary Cohen, US risks losing artificial intelligence arms race to China and Russia, CNN, https://edition.cnn.com/2017/11/29/politics/us-military-artificial-intelligence-russia-china/index.html, published November 29, 2017, Access November 16, 2019.

23   Jamie Seidel, Russia's terrifying new 'superweapon' revealed. Imagine a missile that can choose its own target, decide when to attack and how. Russia has – and the consequences are potentially devastating., https://www.news.com.au/technology/innovation/military/russias-terrifying-new-superweapon-revealed/news-story/b815329f979851288e52a1c4082feb1b, published July 14, 2019, Access November 16, 2019.

24   Ben Brimelow, Russia has serious ambitions for military robotics, Business Insider Deutschland, https://www.businessinsider.de/russia-has-serious-ambitions-for-military-robotics-2017-11?r=US&IR=T, published November 9, 2017, Access November 16, 2019.

25   Amit Paul Chowdhury, Russia Prepares For Future Wars With An Array Of AI-Based Arsenal, Analytics India Magazine, https://analyticsindiamag.com/russia-prepares-future-wars-array-ai-based-arsenal/, published June 15, 2017, Access November 15, 2019.

26   Michael Zillner, Why is Europe Lagging Behind in the Tech Race?, European Generation, https://www.europeangeneration.eu/single-post/2019/02/14/Why-is-Europe-Lagging-Behind-in-the-Tech-Race, published February 14, 2019, Access November 16, 2019.

27   N.n., Battle algorithm. Artificial intelligence is changing every aspect of war: A new type of arms race could be on the cards, The Economist, https://www.economist.com/science-and-technology/2019/09/07/artificial-intelligence-is-changing-every-aspect-of-war, published September 7, 2019, Access November 16, 2019.

28   N.n., Artificial Intelligence for Africa: An Opportunity for Growth, Development, and Democratization, Access Partnership, published November 29, 2018, p. 8.

29   Richard Spencer, Stuxnet virus attack on Iranian nuclear programme: the first strike by computer?, The Telegraph, https://www.telegraph.co.uk/news/worldnews/middleeast/iran/8040656/Stuxnet-virus-attack-on-Iranian-nuclear-programme-the-first-strike-by-computer.html, published October4, 2010, Access November 14, 2019.

30   Yitzi Weiner, Seven Ways Quantum Computing Can Change The World, Medium, https://medium.com/thrive-global/seven-ways-quantum-computing-can-change-the-world-ff5bfbe43e0f, published January 10, 2018, Access November 18, 2019.

31   University of Vienna, Complex quantum teleportation achieved for the first time, Phys Org, https://phys.org/news/2019-08-complex-quantum-teleportation.html, published August 23, 2019, Access November 18, 2019.

32   Katrin Schleife, The German Federal Government's new AI Strategy – future-proofing the German economy, sitsí Market Research Services, https://www.sitsi.com/german-federal-governments-new-ai-strategy-future-proofing-german-economy, published November 22, 2018, Access November 18, 2019.

33   Katrin Bennhold, German Defense Spending Is Falling Even Shorter. The U.S: Isn't Happy, The New York Times, https://www.nytimes.com/2019/03/19/world/europe/germany-nato-spending-target.html, published March 19, 2019, Access November 18, 2019.

34   N.n., AI Research Takes Root In Germany, German Center for Research and Innovation New York, https://www.dwih-newyork.org/en/current-focus-topics/artificial-intelligence/ai-research-takes-root-in-germany/, published unknown, Access November 18, 2019.

35   Nick Wallace/Daniel Castro, The Impact of the EU's New Data Protection Regulation on AI, Center For Data Innovation, published March 27, 2018, p. 17.

36   Will Townsend, Who Is 'Really' Leading in Mobile 5G, Part 4: Infrastructure Equipment Providers, Forbes, https://www.forbes.com/sites/moorinsights/2019/07/19/who-is-really-leading-in-mobile-5g-part-4-infrastructure-equipment-providers/#4557fa579130, published June 19, 2019, Access November 18, 2019.

37   James Bacchus/Simon Lester/Huan Zhu, Disciplining China's Trade Practices at the WTO: How WTO Complaints Can Help Make China More Market-Oriented, CATO Institute, https://www.cato.org/publications/policy-analysis/disciplining-chinas-trade-practices-wto-how-wto-complaints-can-help, published November 15, 2018, Access November 18, 2019.

Imprint

The Author

Benjamin Fricke is desk officer for security affairs at the Konrad-Adenauer-Stiftung in Berlin since June 2018. He also served the Konrad-Adenauer-Stiftung for two year in the regional program South Caucasus and is advisory board member of the Washington, DC based consulting firm Cyber Intelligent Partners (CIP).
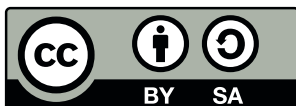

Konrad-Adenauer-Stiftung e. V.

Benjamin Fricke M.A.
Desk Officer for Security Affairs
European and International Cooperation
T +49 30 / 26 996-3795
benjamin.fricke@kas.de

Postal address: Konrad-Adenauer-Stiftung, 10907 Berlin