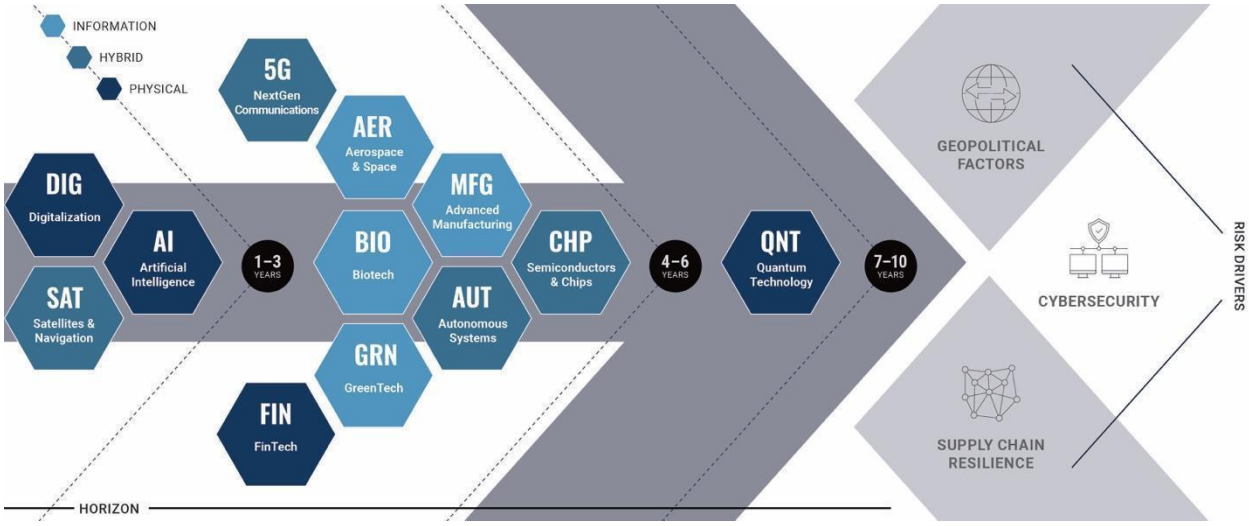
# MATRIX MONITOR

## Friday August 6, 2021

Welcome to Next5's weekly digest – emerging technology news and analysis to keep you on your game and ready for what's Next




*This week's Monitor features new communications technology for the ISS, analysis on the U.S. failure to globally compete in telecommunications, the prospect of Russian space tourism, a decision to keep SpaceX as the sole winner of a NASA contract for lunar landers, a delay in Boeing's CST-100 Starliner test flight, an exploration of trends in Chinese robotics patenting, Google's possible discovery of time crystals, and Xi Jinping's ongoing crackdown on Chinese tech.*

# DIGITALIZATION

→ **A new study from researchers at the University of Virginia and the University of Southern California found that employees are more willing to accept tracking if the data that's gathered is analyzed by technology instead of humans.** The researchers say people tend to perceive technological analysis as valuable information—something that can help them do their jobs better. Tracking that simply provides information to employees enhances their sense of autonomy and motivation and makes them less likely to quit, the researchers found. Companies can assimilate tracking data to help employees discover the steps they should take to improve their performance without opening employees to human criticism. #DIG #USA WSJ

→ **The European Commission is using a new authority to review Facebook's proposed takeover of Kustomer, a startup specializing in customer-service platforms and chatbots.** The Commission feels it's necessary to assess and potentially block dominant companies from buying up smaller players to eliminate would-be rivals. Such deals are known as killer acquisitions because they can snuff out competition. Some antitrust lawyers say the new policy, which requires no regulatory or public review, introduces uncertainty and lacks legal rigor. Even those less overtly critical say it remains unclear how the commission will use its new powers. Commission officials have pledged to use the new approach selectively, making it preferable to a proposed alternative of lowering the revenue threshold for deal review, which would indiscriminately snared far more companies. #DIG #USA #EUR WSJ

→ **Alibaba reported an increase in revenue in the latest quarter, but profits fell as it stands to keep up with increased competition in China's e-commerce market.** While Alibaba still leads the industry, e-commerce rivals such as Pinduoduo, Bytedance's short-video platform Douyin, and Tencent's social-media app WeChat, have gained ground with new and innovative ways to reach consumers. On Tuesday, Alibaba said it would continue investments that have led to growth in focus areas like grocery shopping and consumers in lower-tier cities. The company said it added about 14M monthly active mobile users in China retail to reach 939M this quarter. The company also noted its support for China's shifting regulatory environment and said it would work to comply with new expectations. Alibaba's U.S.-traded shares declined about 3.5% Tuesday morning. And year to date, shares have fallen by about 17% amid regulatory concerns. #DIG #CHN WSJ

# SATELLITES & NAVIGATION

→ **Startup companies Satelles, TrustPoint, and Xona are responding to U.S. government demand for GPS backups and alternatives**. TrustPoint and Xona are focused on the future, when autonomous cars, delivery drones, and urban air taxis need extremely precise location data. Satelles already provides positioning, navigation, and timing signals from Iridium Next satellites. Government funding is helping the startups in the near term. In the long run, though, commercial demand could be far stronger. #SAT #USA SpaceNews



© 2021 | Next5 Inc | All rights reserved

→ **The next generation of GPS satellites could host additional payloads to provide communications services, the U.S. Space Force said in an RFI.** The Space Force is considering hosting satellite communications payloads on the GPS constellation starting in 2030. The preferred frequency bands are X and Ka, but other satcom frequencies may be considered as well. The U.S. constellation of GPS satellites orbits at altitudes of about 20,000 kilometers, and the U.S. military now relies on communications satellites deployed in geostationary orbits about 35,000 kilometers above Earth. Having satcom services on GPS satellites would give the military another option to increase connectivity. #SAT #USA SpaceNews

→ **Significantly faster communications could be coming to the International Space Station in 2024, after SpaceLink won funding to test its incoming relay satellites.** The Center for the Advancement of Science in Space (CASIS), which manages the U.S. National Laboratory on the ISS, selected the startup to test its 10 gigabit per second (Gbps) optical terminal from the station. Spacelink plans a relay constellation of four spacecraft in medium Earth orbit, which will primarily deliver services to satellites in low Earth orbit. According to SpaceLink, its satellites at higher altitudes will always be visible to spacecraft in LEO and a gateway ground station on Earth, enabling direct data delivery to any point on the globe in milliseconds. Its ISS demo mission aims to validate SpaceLink's hybrid optical and radio frequency (RF) network, and optical terminal technology, which the crew can use for onboard systems, experiments, and communications with people on the ground. #SAT #USA SpaceNews

# ARTIFICIAL INTELLIGENCE

→ **New legislation in the Senate this week proposes establishing a Deepfake Task Force within the Department of Homeland Security**. The Deepfake Task Force Act would charge the DHS task force with creating a coordinated plan to explore how a "'digital content provenance' standard could assist with reducing the spread of deepfakes, develop tools for content creators to authenticate their content and its origin, and increase the ability of civil society and industry leaders to relay trust and information about the source of the deepfakes to consumers." The senators said the task force would include experts from academia and the public and private sectors. #AI #USA Meritalk

→ **U.S. Northern Command recently completed tests for Global Information Dominance Experiments (GIDE)—a combination of AI, cloud computing, and sensors.** The machine learning-based system observes changes in raw, real-time data that hint at possible trouble. For example, If satellite imagery shows signs that an adversary nation's submarine is preparing to leave port, the AI could flag that mobilization knowing the vessel will likely leave soon—military analysts can take hours or even days to comb through this information. Command leader General Glen VanHerck believed the military was "ready to field" the software, and could validate it at the next Globally Integrated Exercise in spring 2022. Instead of merely reacting to events or relying on outdated info, the Pentagon could take proactive steps like deploying forces or ramping up defenses. While humans will still be heavily involved, the tech could be



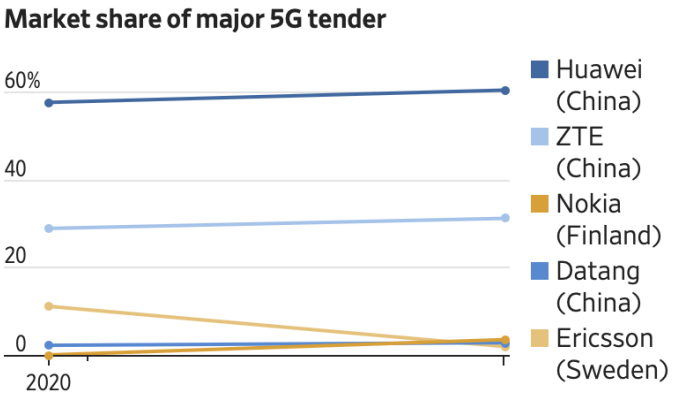
© 2021 | Next5 Inc | All rights reserved

worthwhile if it prevents a 'surprise' attack or leads to negotiations instead of conflict. #AI #SAT #USA Engadget

# NEXT GENERATION COMMUNICATIONS

→ **A recent CSET Policy Brief, *The Huawei Moment*, assesses that the U.S. failed to prevent China from taking the lead in telecommunications.** Despite leading in telecommunications throughout the twentieth century, the U.S. now finds itself forced to choose whether to accept the economic costs of delaying the deployment of a new generation of communications technology or instead run the security risks of choosing the market leader, Chinese firm Huawei. The U.S. government ultimately failed to monitor the decline of U.S. leadership in telecommunications and when national security concerns were raised about this, it did not see the tools available to attempt to alter the situation. In contrast, the Chinese government made advanced telecommunications a national priority and provided a variety of support to Huawei. The study argues for a focus on those national security relevant technologies that are most at risk of foreign adversarial competition—not only military-related technology. This involves increased investments and strategic planning that builds robust private-public partnerships and supports the development of key enabling technology, infrastructure, and human capital. The 5G case study also provides a cautionary tale for additional strategic emerging industries—such as AI, biotechnology, and clean energy. #5G #CHN #Geopolitics CSET

→ **The $35B global cellular-equipment market can be divided into three segments of roughly equal size: China, the U.S. and the rest of the world, as the West curbs Huawei and ZTE, China continues to shun Ericsson and Nokia**. Countries that have enacted or are considering restrictions against Huawei comprise more than 60% of the world's cellular-equipment market. In a tender worth about $6B, China Mobile awarded about 60.5% of the value to Huawei, up from 57.7% in last year's round. It gave 31.2% to ZTE and 2.8% to smaller Chinese supplier Datang Telecom Group. Nokia won the biggest share for a foreign company, at 3.5%. The small market share means Ericsson and Nokia will mostly miss out on the world's most aggressive 5G rollout this year. In 2020, Sweden explicitly banned Huawei and ZTE from supplying its 5G networks, going beyond European counterparts that put restrictions on the Chinese companies without naming them. And China warned that it could retaliate against Ericsson, in a threat it followed through after the Swedish government brought legal challenges on Huawei. As a result, Ericsson reported losing $300M in second-quarter sales in China compared with a year earlier. Nationalism isn't new in the telecom space. Two decades ago, the U.S. favored Lucent,



Source: Jefferies



© 2021 | Next5 Inc | All rights reserved

Canada preferred Nortel, and France favored Alcatel. All three hit tough times, in part because Huawei and ZTE began selling competitive products at lower prices, and ended up being absorbed by Ericsson or Nokia. Those companies are today's only major Western rivals to Huawei. Since then, with the U.S. lacking its own major industry player, Washington has tried to support the Nordic companies as well as Samsung by offering loans to get developing countries to buy non-Chinese telecom equipment. The U.S. has also used export controls that make it hard for Huawei to buy supplies it needs for products. #5G #CHN #SDN #USA #KOR #CAN #FRA #GBR #Geopolitics #SCRM WSJ

→ **Huawei CFO Meng Wanzhou is returning to a Canadian courtroom on Wednesday for the final weeks of her U.S. extradition hearings, as the legal proceedings running more than two years draw to a close.** Meng, 49, was arrested in December 2018 at Vancouver International Airport on a warrant from the United States, charging her with misleading HSBC Holdings about Huawei's business dealings in Iran, potentially causing the bank to violate American economic sanctions. In the days following Meng's arrest, which immediately soured relations between Ottawa and Beijing, China detained two Canadians - Michael Spavor, a businessman, and Michael Kovrig, a former diplomat. Ottawa has repeatedly pressed Washington for help in pressuring China to release the men and is feeling more optimistic about U.S. support with the change in Administrations. #5G #CHN #CAN #USA #Geopolitics Reuters

# FINANCIAL TECHNOLOGY

→ **Policymakers have struggled to respond to the mostly unregulated $1.6T digital money market.** U.S. Securities and Exchange Commission Chair Gary Gensler is contemplating a robust oversight regime; he has asked Congress to pass a law that could give the agency the legal authority to monitor crypto exchanges, but he says the SEC's powers are already broad. There's been much discussion over the years about which kinds of digital assets fall under the SEC's purview. Some such as Bitcoin that act like currencies are considered commodities, not securities. But there are thousands of other coins, and Gensler believes most are unregistered securities that must comply with SEC rules. Behind the scenes, Gensler has pushed the agency's staff members to take a look at an array of potential policy changes. He says there are at least seven SEC initiatives looking at different crypto issues: initial coin offerings, trading venues, lending platforms, decentralized finance, stable value coins, custody, and ETFs and other coin funds. Broadly, he noted that technology has sparked economic progress throughout history, and he sees a similar boost from digital assets. That may only come, however, with strong and thoughtful regulation. #FIN #USA Bloomberg

→ **Square has agreed to acquire Afterpay in an all-stock deal worth around $29B, highlighting how financial technology companies are seeking scale to challenge banks for a bigger slice of the payments industry.** Square said a key attraction of the deal was a growing wariness toward traditional credit among younger consumers, a group particularly hard hit by the Covid-19 pandemic, as lockdowns crushed many hospitality and casual jobs. Afterpay's technology allows users to pay for goods in four, interest-free installments while receiving the goods immediately. Customers pay a fee only if they miss an automated payment,



© 2021 | Next5 Inc | All rights reserved

a transgression that also locks their account until the balance is repaid. Square, best known for its white card reader that plugs into phones and tablets, plans to add Afterpay as a financing option through the smaller merchants it serves. Afterpay customers will be able to make payments on their installment loans through Cash App, Square's digital payment service that allows people to store and transfer money as they would at a bank. #FIN #DIG #USA WSJ Bloomberg

## AEROSPACE & SPACE

→ **The head of Roscosmos suggested a future Russian space station could have a module devoted to space tourism.** In a talk Monday, Dmitry Rogozin said he told designers of the Russian Orbital Service Station at a meeting last week that the station should have a separate module for commercial visitors. It's unclear how seriously that proposal is being considered, and the station itself is still in its early planning phases and may not launch until late this decade. #AER #RUS TASS

→ As we reported last week, Jeff Bezos offered to waive $2B so NASA could return to an original plan to have two companies provide lunar landers for its Artemis program. **But on Friday July 30, the U.S. Government Accountability Office upheld the decision to make Elon Musk's SpaceX the sole winner of the contract**—a setback to Bezos' space enterprise. The decision was in response to protests that an affiliate of Mr. Bezos' Blue Origin and Dynetics, a unit of Leidos, filed after NASA in April awarded a $2.9B contract to SpaceX for the lander. NASA had opted to go with a single supplier amid budget constraints. And the agency said Friday that the GAO's decision would allow it to set a timeline with SpaceX for landing astronauts back on the moon for the first time in more than 50 years. #AER WSJ


→ **A problem with Boeing's CST-100 Starliner commercial crew vehicle scrubbed a launch attempt Aug. 3, pushing back its uncrewed test flight by several days.** Boeing announced about three hours before liftoff that the launch had been postponed for the day. In a statement a short time later, the company said engineers detected "unexpected valve position indications in the propulsion system" of the spacecraft. Starliner will launch on a mission called Orbital Flight Test (OFT) 2, a rerun of the original OFT mission launched in December 2019. That mission suffered serious software problems after reaching orbit, calling off a docking attempt with the ISS and forcing the spacecraft to land after just two days. A successful OFT-2 mission would allow NASA and Boeing to proceed with a crewed flight test with three NASA astronauts on board as soon as the end of this year, although industry sources believe a launch in the first half of 2022 is more likely. It would leave Boeing at



© 2021 | Next5 Inc | All rights reserved

least a year and a half behind SpaceX, which first launched astronauts on its Crew Dragon spacecraft in May 2020 and is currently in the middle of its second operational mission to the station. #AER #USA SpaceNews

## BIOTECHNOLOGY

→ **Sanofi agreed to pay $3.2B to acquire mRNA specialist Translate Bio, a big vote of confidence that the new technology holds promise beyond the pandemic.** The healthcare company said the deal would accelerate work already under way with Translate Bio to develop mRNA vaccines for Covid-19, seasonal flu, and other infectious diseases. MRNA technology proved itself during the pandemic when it beat out more traditional vaccine methodologies in the race to develop shots against Covid-19. It hasn't been shown to work in other diseases, but several big companies including Pfizer and GlaxoSmithKline are working on mRNA vaccines for flu and other infectious diseases, spurred by the hope that they could be more effective and simpler to manufacture than traditional counterparts. In June, Sanofi said it would invest $475M a year in mRNA vaccine research. Translate Bio is exploring using mRNA as a treatment for diseases where the body lacks the ability to make a certain protein. Its most advanced drug program is aimed at cystic fibrosis. #BIO #FRA #USA WSJ

→ **CRISPR is now driving development in agriculture**. Though it has been slower to realize agricultural applications than biotechnology and biomedical applications, CRISPR is ready to help cope with an array of agricultural challenges that includes an expanding population, a rapidly warming climate, and a shrinking supply of arable land. As an example, a tomato called the Sicilian Rouge High GABA was developed in Japan to help consumers reduce their blood pressure. If this product does well, it may encourage other agbiotech companies to ramp up their own CRISPR genome editing programs. CRISPR has both practical and regulatory advantages over traditional plant breeding and genetic modification methods. Consequently, CRISPR is looking increasingly attractive to agbiotech companies that hope to engineer products that can improve human health and the environment. #BIO #GRN #JPN GEN

## GREEN TECHNOLOGY

→ **Auxin Solar and Suniva plan to ask the U.S. International Trade Commission on Monday to extend solar tariffs for four years.** The 18% tariffs were imposed in 2018, and are set to expire next year—they largely affect imports from Chinese-owned companies. China is the world's largest producer of solar cells and panels used to generate electricity, although it has moved some of its production to elsewhere in Asia to avoid U.S. tariffs. The companies say extending the tariffs is necessary to "secure America's solar energy independence" and to "rid the solar supply chain of injurious and unfair trade practices" that hurt American workers. Tariffs provide an incentive for domestic manufacturing of solar panels—an industry that has been eviscerated by cut-rate Chinese competition. But they also raise the cost of solar panels to business and residential customers, potentially slowing the spread of clean technology. Since the tariffs were imposed, solar panel production in the U.S. has tripled. In Congress, several



© 2021 | Next5 Inc | All rights reserved

lawmakers are working on legislation to create tax incentives for domestic solar manufacturers. #GRN WSJ

→ **Europe's plan to phase out combustion-engine vehicles has put the region at the forefront of climate protection, yet without progress cleaning up poorer nations' roads, it won't be enough to keep global warming below dangerous levels.** While virtually all of the world's population growth by 2050 is forecast to take place in developing countries, thousands of cities in Africa, Asia, and Latin America may stick to fossil fuel-powered vans, buses, and motorcycles for decades. Richer nations are responsible for most of the man-made warming, with three-quarters of industrial emissions originating in North America, Europe, and China, according to University of Oxford research. Africa accounts for just 3% of the total, but its share is expected to climb rapidly due to population growth. When the Paris climate accord was adopted in 2015, countries pledged to keep global warming below 2 degrees Celsius. Researchers now believe a 1.5-degree cap is required to avoid some of the most catastrophic consequences of climate change, putting pressure on the West to also assist poorer nations in their quest to rein in emissions. #GRN Bloomberg

→ **In the U.K Electricite de France SA wants to make hydrogen at the proposed 20B-pound Sizewell C nuclear plant on the southeast coast, marking the first time these technologies would be combined on a commercial scale in Europe**—similar trial runs are also being held in North America. The U.S. Department of Energy has awarded $26.2M to two projects run by Xcel and FuelCell Energy to help nuclear plants switch between electricity generation and hydrogen production when necessary. Achieving net-zero emissions by 2050 could require as much as $173T in investments globally. By then, Britain's energy market will have transformed: renewable capacity is expected to triple while electricity demand doubles. The U.K.'s Nuclear Industry Association estimates that a third of the nation's hydrogen could come from atomic energy. The U.K. has set a target for 5 gigawatts of hydrogen production by 2030, envisioning its use in road transportation, home heating, and ship propulsion. With enough supply, clean hydrogen could meet a quarter of the world's energy needs by 2050. #GRN #GBR Bloomberg

→ **Electric vehicle sales at China's Li Auto and Xpeng more than tripled in July from a year ago, while they doubled at Nio, helped by robust demand for new energy automobiles in the world's biggest auto market.** The rise in July deliveries comes at a time when electric car makers have been expanding manufacturing capacity in China, encouraged by the country's policy of promoting greener vehicles. The three companies compete with U.S. electric car maker Tesla, which dominates the EV market in China. The strong sales numbers for the EV makers come as a global recovery in auto sales is being threatened by chip shortage that has forced automakers around the world to adjust assembly lines, cut productions, and shutter factories. #GRN #CHN #USA WSJ



© 2021 | Next5 Inc | All rights reserved

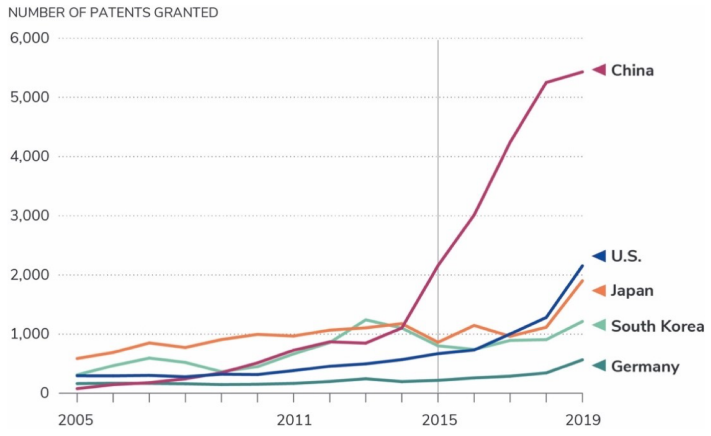
# ADVANCED MANUFACTURING

→ **A recent CSET Data Brief, *China's Robotics Patent Landscape*, explores trends in Chinese robotics patenting as a measure of robotics advancement.** China has seen prodigious growth in its robotics patents over the past decade. This growth corresponds with increases in Chinese robotics scholarly literature, the number of Chinese robotics companies, and the number of robots and robotics installations currently deployed in China. China's significant growth is relevant from a policy perspective: the development of China's robotics industry could give Chinese companies an advantage and produce significant market distortions. The rise of China's robotics industry also potentially challenges the United States' role as a technological leader and positions China to develop novel robotics technologies and buttress its military capacity.

Key Findings:

- ➔ The top patenters in robotics between 2010 and 2019 were the United States, China, Japan, South Korea, and Germany. China became the world leader in robotics patenting in 2015 after years of dramatic growth. Chinese organizations comprise most of the top 100 robotics patent grantees globally.
- ➔ The top countries in robotics patenting are also leaders in output of robotics scholarly literature and robotics operational stock, meaning number of robots available to be deployed.
- ➔ Differences between country and regional patenting offices make direct comparisons difficult, but this analysis suggests that many of China's patents may face lower thresholds for quality control than other top countries' patents, tempering China's lead in robotics patents.
- ➔ Despite being the top robotics patenter, China is not the world's leader in production of robotics; Japan is. However, China is rapidly increasing its robotics production, number of robotics firms, and robotics purchasing. #MFG #CHN #USA CSET

Figure 2. Top Countries' Robotics Patent Growth




Source: 1790 Analytics robotics patent dataset.



© 2021 | Next5 Inc | All rights reserved

→ **New orders for U.S.-made goods increased more than expected in June, while business spending on equipment was solid, pointing to sustained strength in manufacturing even as spending is shifting away from goods to services.** The Commerce Department said on Tuesday that factory orders rose 1.5% in June after advancing 2.3% in May. Economists polled by Reuters had forecast factory orders increasing 1.0%. Orders soared 18.4% on a year-on-year basis. As millions of Americans were cooped up at home, demand pivoted towards goods during the COVID-19 pandemic, boosting manufacturing, which accounts for 11.9% of the U.S. economy. But the surge in demand is straining the supply chain. The increase in factory goods orders in June was broad, with notable gains in machinery, computers, and electronic products, as well as electrical equipment, appliances, and components. Though momentum is slowing, manufacturing will likely continue to expand. #MFG #USA Reuters

## AUTONOMOUS SYSTEMS

→ **In Tokyo, Toyota's autonomous, battery-powered, e-Palettes are currently being used to ferry athletes and staff around the Olympic site.** Toyota says it's aiming to commercialize the e-Palette within a few years, and it's said it'll work with companies including Amazon, Pizza Hut, and Uber to launch them. The e-Palettes roving around the Olympic Village are only capable of driving themselves under certain limited conditions. E-Palettes will also feature in the smart city that Toyota is building at the base of Mt. Fuji. There, they'll navigate autonomous vehicle lanes, provide shared transportation, deliver packages, and act as mobile storefronts. In addition to streamlining transportation processes across a broad spectrum of industries—both civilian and military, autonomous vehicles can also make travel safer. According to the World Bank, there are about 1.25M worldwide traffic fatalities annually and far more traffic injuries. Automated driving technology could drastically reduce this number by helping to prevent crashes caused by human error. #AUT #JPN Bloomberg

## SEMICONDUCTORS & CHIPS

→ **A new report from the Semiconductor Industry Association & Boston Consulting Group said U.S. chip manufacturers suffered from "structural disadvantages in the cost of two factors: labor and utilities**." Labor costs for chip fabrication, construction, and operation are 40% higher than in Singapore and Taiwan, the report said. But the higher U.S. labor cost had less impact on companies' choice of manufacturing location than subsidies abroad. The report said a $50B government incentive would attract 19 new U.S. chip fabrication facilities, or 10 more than would be the case without the money. And the new facilities would raise U.S. capacity to 14% of the market by 2030 from 12%. #CHP #MFG #USA Roll Call

→ **China's regulatory agency is launching an investigation into chip distributors in the auto industry, citing suspicions of price gouging.** The action by the State Administration for



© 2021 | Next5 Inc | All rights reserved

Market Regulation (SAMR) is the latest in a regulatory crackdown over the past year that has targeted a range of companies and industries as the Chinese government clamps down on industry. The firms were suspected of driving up prices, based on price monitoring and reporting clues. The agency vowed to investigate and punish illegal acts such as hoarding, price-gouging, and collusion. After the news, China's CSI All Shares Semiconductor & Semiconductor Equipment Index fell by roughly 6%. #CHP #CHN Reuters

→ **The UK government is considering blocking chip designer Nvidia's $40B acquisition of British peer Arm on potential national security risks.** Arm, currently owned by Japan's SoftBank Group, is a major player in global semiconductors. In April, the UK government said it is invoking national security to investigate the deal and that the Competition and Markets Authority (CMA) will assess the competition, jurisdiction, and national security impact of the deal. #CHP #GBR #Geopolitics #SCRM Reuters

→ **In the second quarter, Samsung overtook Intel as the world's top chip maker by revenue.** The South Korean tech company, which specializes in memory chips, racked up $19.7B in semiconductor revenue during the April-June quarter. Total revenue for Intel was $19.6B—or $18.5B after subtracting the contribution of a business unit it has agreed to sell. Though many firms, including Nvidia and Qualcomm, design superpowered chips, only TSMC and Samsung are able to manufacture them. Intel could join that list if its contract chip-making ambitions materialize. The next frontiers of chip making are so demanding that only TSMC, Samsung, and Intel have the technological capability and deep pockets to proceed. The three-company race will ultimately dictate where, and by whom, the advanced semiconductors essential for 5G cellular networks, self-driving cars, and artificial intelligence are made. #CHP WSJ

# QUANTUM TECHNOLOGY

→ **In a preliminary study, a Google-led team of physicists may have discovered proof of time crystals through a simulation on the company's quantum computer.** The researchers said that their experiment offers preliminary evidence that their system could create time crystals and add that the tunability of their approach offers a better chance of scalability and paves a way for further study. Researchers performed the experiment on Google's Sycamore device, the same device that, in 2019, Google claimed it demonstrated quantum supremacy by completing a task in 200 seconds that would take a conventional computer 10,000 years. Time crystals harness a quirk of physics in which they remain ever-changing yet dynamically stable. In other words, they don't give off energy as they change conformation, making them an apparent violation of the natural law that all things gradually turn towards entropy and disorder—the second law of thermodynamics. Time crystals represent a new, bizarre phase of matter— the discovery could have profound implications for the finicky world of quantum computing. #QNT The Quantum Daily Futurism Yahoo

→ **Multiverse Computing has joined the Strangeworks Quantum Syndicate to enable their team to develop financial applications utilizing quantum hardware providers available**



© 2021 | Next5 Inc | All rights reserved

**through the Strangeworks ecosystem.** Multiverse Computing provides software and consulting services to financial institutions to help them solve real world problems with quantum computing and quantum inspired solutions. The company's algorithms span all possible quantum computing hardware types which aligns with Strangeworks's mission to enable its users to develop quantum algorithms for use across the most diverse landscape of quantum computing hardware. Strangeworks has built a complete ecosystem of tools that are designed for businesses and consulting firms alike. By partnering with Strangeworks, Multiverse Computing's experts gain access to exclusive quantum computing hardware and novel quantum architectures to conduct algorithms research and deliver new insights to its customers. #QNT The Quantum Daily

# GEOPOLITICS

→ **Xi Jinping is unleashing the full force of the state against the country's tech sector.** First it was Jack Ma's quasi-disappearance, then the removal of rideshare company Didi from all mobile-app stores. Most recently, the government went after China's online-tutoring companies. Most observers have interpreted it as a power play: Xi's asserting state dominance over increasingly powerful multinational companies. Others give the party more credit, seeing the regulatory crackdown as a deliberate tactic in China's technological grand strategy. A report last year said Chinese government sees "hard tech" (semiconductors, aircraft, etc.) as "more valuable than products that take us more deeply into the digital world." The party's goal is to "compress the wage and status premia of the internet and finance sectors" and thereby push workers and investors toward markets deemed more strategically important. But interference in the affairs of businesses inhibits the formation of organizational capital necessary for hardware production — moving software engineers into hardware roles does nothing to solve the problem. By putting the party's willingness to undermine businesses on full display, Xi has made it less likely that China will achieve "indigenous innovation." #Geopolitics #CHN MSN

→ **U.S. regulators will require additional disclosures from Chinese companies before allowing them to sell shares in the U.S., following new restrictions from China's government on companies that raise capital offshore.** The new disclosure requirements will mostly focus on Variable Interest Entities, or VIEs, a form of a shell company used to skirt Chinese-government restrictions on foreign ownership and listing on overseas exchanges. SEC Chairman Gary Gensler said he worries that U.S. investors may not realize that they are purchasing stock in shell companies rather than an operating company in China. Now, companies seeking to sell shares in the U.S. must first file a registration statement with the SEC. The process involves a back-and-forth between the company and SEC lawyers over the disclosures contained in the statement before it is eventually declared effective, allowing the company to proceed with an IPO. Upon hearing of the crackdown, the SEC's Chinese counterpart called for talks with the US. #Geopolitics #CHN #USA WSJ Bloomberg

→ **CNAS' National Technology Strategy project proposes a framework for a comprehensive, whole-of-nation approach for the U.S. to navigate the global technology**



© 2021 | Next5 Inc | All rights reserved

**competition.** The first report in this initiative, "Taking the Helm," makes the case for a national technology strategy and lays out what such a modern-day strategy should be. How the U.S. government should structure itself organizationally and bureaucratically to execute such a strategy is the focus of the second report, "Trust the Process." The third report in the series focuses on concrete and pragmatic measures that U.S. policymakers should take to operationalize a national technology strategy. The report proposes four recommendations for operationalizing a U.S. national technology strategy: bolster the Department of Commerce, mitigate supply chain and technology transfer risk, streamline technology policy coordination and implementation, and increase capacity to pursue international technology partnerships. #Geopolitics #CHN #USA CNAS

→ A new CSET report finds: **As commercially developed, dual-use technologies transform the national security landscape, policymakers have called on the Department of Defense to bring more private sector innovation into the military.** Recently, the DOD has attempted to engage tech companies through an array of "innovation" offices and programs scattered across the Office of the Secretary of Defense (OSD) and the services. While these efforts have yielded numerous engagements, they have not driven innovative capabilities into the major systems and platforms that make up the bulk of the military's force structure. This is not a failure of the offices themselves, but rather a failure of the department's leadership to integrate them into the broader DOD acquisition ecosystem. A few isolated organizations and programs alone cannot transform the culture and technological capabilities of the entire U.S. military. Unless the DOD adapts its acquisition strategy and the incentives of the organizations responsible for carrying it out, its capabilities will lag behind the state of the art, particularly in digital technologies, and its competitive advantage will continue to erode. #Geopolitics #USA CSET

## CYBERSECURITY

→ **National Cyber Director Chris Inglis on Monday made the case for establishing an office within DHS to track and analyze cybersecurity incidents** to ensure the nation has an early warning system to understand adversary efforts to target U.S. organizations. Inglis pushed for the establishment of a Bureau of Cyber Statistics within DHS as a means to help tackle the increasing number of major cyberattacks over the past year. The idea for the new office was first floated by the Cyberspace Solarium Commission (CSC), a congressionally established organization made up of members of Congress, federal officials and industry leaders which produced a report last year on ways to defend the U.S. in cyberspace. #Cybersecurity #USA The Hill

## SUPPLY CHAINS

→ **The union representing workers at Chile's La Escondida copper mine said its members voted to reject the most recent contract offer from the mine's owner and go on strike, potentially risking disruptions to the supply of a key metal as the world's economy continues to recover from the impact of the coronavirus pandemic.** BHP Group-controlled



© 2021 | Next5 Inc | All rights reserved

Minera Escondida, located in Chile's northern Atacama Desert, is the world's largest copper mine. It produces almost 5% of the world's supply of the metal, which is used to make electrical wiring and motors and in construction, among many other applications. Earlier this year, copper prices surged to a record on expectations of a continued global economic recovery and a mushrooming energy transition that will require lots of copper for electric vehicles and renewable power. While some analysts think expectations of a disruption to the mine are already reflected by a recent jump in prices, others say a strike could help drive prices for the metal, used in everything from cars to air conditioners, to a record. #SCRM WSJ

→ **Apple is working with more Chinese suppliers to produce its latest iPhones as a tech feud stemming from a trade war with the U.S. prompts Beijing to strengthen domestic firms.** Apple has warned of supply shortages as the US-China trade tensions and the pandemic intensify pressure on global supply chains. Beijing is also strengthening efforts to create world-leading local tech firms, with apparently government-supported Chinese firms working to manufacture products for global firms, including Apple. CEO Tim Cook in July said there were some shortages and that it was difficult to get the entire set of parts within lead times. This supply chain volatility has led the executive to act both as a CEO and a diplomat. #SCRM #DIG #USA #CHN #Geopolitics Nikkei Reuters



© 2021 | Next5 Inc | All rights reserved