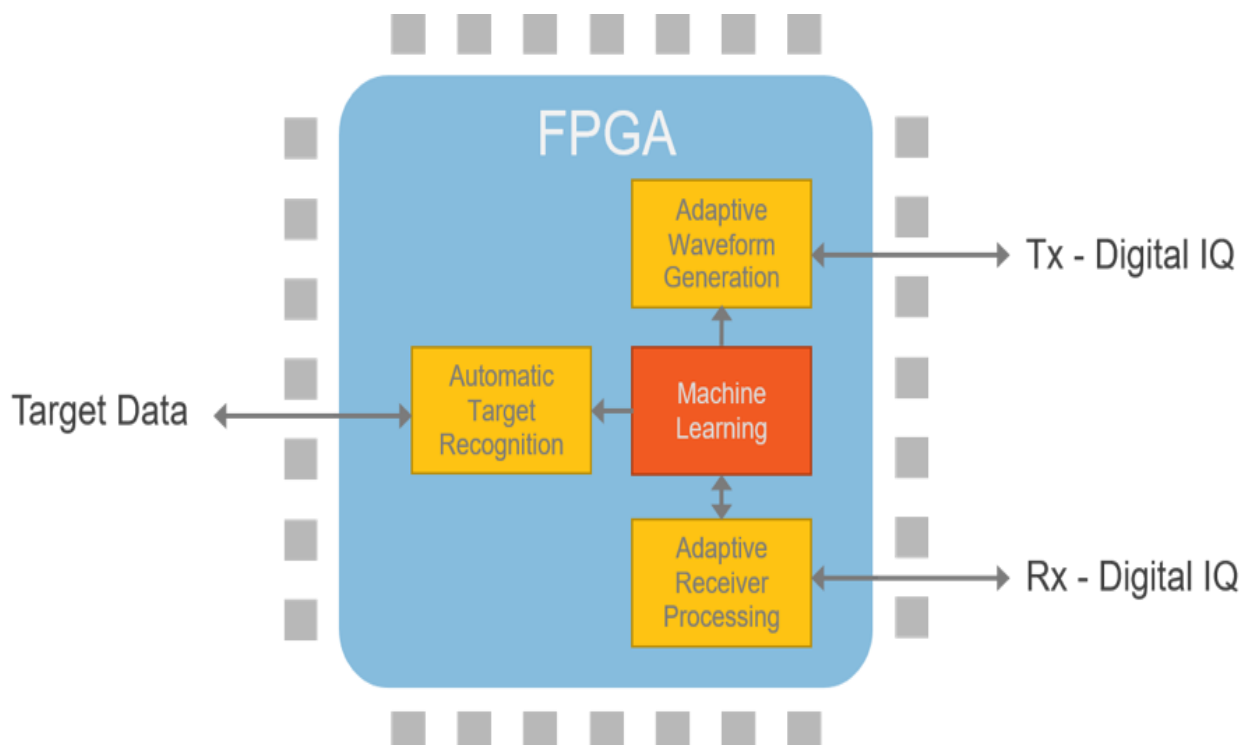


CENJOWS

RADARS AND ICT DEVELOPMENTS IN CHINA

Evolving FPGA Technology for Cognitive Techniques in Radars. FPGA technology continues to improve and the computational capability of today's FPGAs opens the door for innovative techniques that weren't possible five years ago. For example, engineers are now applying machine learning techniques so that radars are more responsive to their environment. By using machine learning, radars can perform new techniques like automatically recognizing different targets, or adjusting their operating frequency or waveform based on what's going on around them.



Comments. Higher level FPGA programming tools like the *Lab VIEW* FPGA Module are becoming more capable, making it easier to port algorithms to FPGAs. This is a game changer for engineers and scientists who don't have previous Hardware Description Language (**HDL**) expertise or who have tight timelines. The tight integration between NI hardware and software allows Lab VIEW FPGA to go a step further by abstracting the hardware infrastructure, such as PCI Express, memory controllers, and clocking.

(Source: https://forums.ni.com/t5/NI-Blog/4-Underlying-Technologies-That-Are-Changing-the-Game-for/bap/3838006?cid=Twitter-127904-Global-Paid_Broadbased)

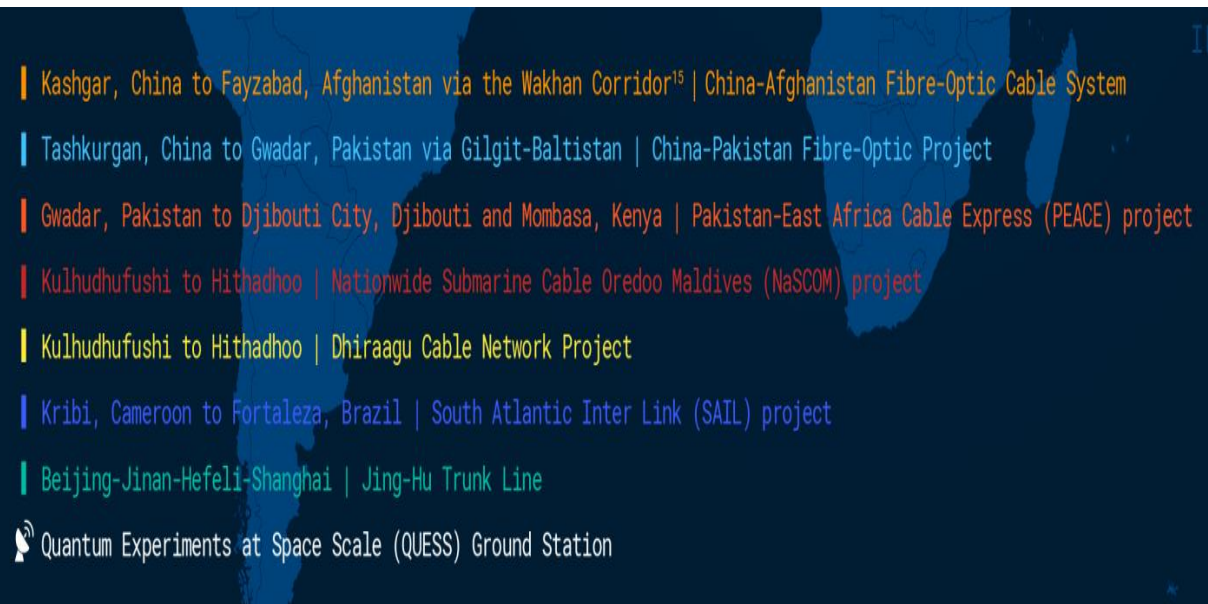
China Using Bandwidth hired from US Satellites. U.S. forces frequently patrol South China Sea in order to ensure free commerce routes. However reportedly China is using nine US satellites to provide information to Chinese soldiers on remote and contested outposts in the South China Sea and to also strengthen their police forces against social unrest and ensure the state message reaches as far as it can. A tenth satellite, which is currently under construction by Boeing, is supposed to enhance the Chinese version of the U.S. Global Positioning System, which in turn could help the Chinese military guide weapons to their targets.

Comments. Though China has made rapid strides in high technology fields like AI, yet it lags behind US in terms of space tech. CIA has recently warned allied intelligence assets of the dangers of dealing with Chinese telecom companies such as Huawei. While U.S. has laws prohibit US companies from exporting satellites to China, the laws do not regulate how bandwidth from those satellites are used. China is able to thus rent bandwidth from U.S. satellites. Also, offshore firms have allowed China to utilize U.S. technology without drawing suspicion. In China, the Internet is heavily regulated, with the government overtly reminding the local population that they are always being watched.

(<https://nationalinterest.org/blog/secret-sky-china-using-american-satellites-military-gains-54157>)

China's Strategic Edge in Global Communications. In 2016, Huawei laid 1200-km long submarine communications cables, connecting the scattered Maldivian atolls. China later installed a land-based cable network from Tashkurgan in China through the Khunjerab Pass in Gilgit-Baltistan to Gwadar in Pakistan (an important port in the CPEC). Huawei is installing the Pakistan-East Africa Cable Express, which will connect Gwadar, to Djibouti in Africa. China has tested a sophisticated satellite link to Europe and is laying a 6000-km submarine cable – between Cameroon and Brazil, called South Atlantic Inter Link (SAIL). This makes China only the third country (after the US & Japan) to offer such a telecommunications connection between Africa and South America.

In a major technology demo in 2017, a consortium of Chinese R&D labs connected its cities of Beijing, Jinan, Hefei, and Shanghai with an almost 2000-km long quantum-ICT cable network. China has installed a restricted metropolitan area quantum-ICT cable network for a select number of offices in the city of Jinan. In 2017 itself, the Chinese Academy of Sciences (CAS) through its Mozi satellite transmitted an inter-continental video call, encrypted with a novel quantum cryptography protocol, between ground stations in Beijing and Vienna, Austria. Beijing also has built a quantum satellite ground station at Shiquanhe in Ngari province in Tibet. China's autonomous enclaves, like Gwadar and Djibouti, could also possess quantum satellite ground stations or a metropolitan area network of quantum ICT cables, like the one installed in Jinan.



Comments. China is steadily deploying communications systems to connect its strategic and economic assets in Asia and linking them to Africa, and from Africa to South America. China has emerged as a major player in global telecommunications. Undoubtedly the Chinese see telecom as a new frontier in their military doctrine. In 2015, the PLA's Zhejiang Provincial Military Command had introduced a new-generation submarine cable-laying ship and a year later, the PLA's Naval University of Engineering had established an R&D laboratory for underwater optical networks collaborating with the Chinese private sector. In Nov 15, departments dealing with cyber, space, electronic, and IW activities were merged into a single joint operations division called PLA Strategic Support Force (PLASSF) entirely under the command of the CMC. The PLA is steadily developing capacities to dominate such networks and surpass Russian and American capabilities in the domain.

Quantum ICT systems can transmit data with extremely secure encryption and at high speeds via satellites or through cable networks. Most of these quantum ICT systems' technologies are currently in nascent stages of R&D but could be utilised by the PLASSF. Ngari is less than 100 km east of the India-China Line of Actual Control. A quantum satellite ground station, located so close to a demarcation line, can be used for covert communications between the PLA's Western Theatre Command and the forward military deployments against India. Such ICT-connected enclaves like Gwadar and Djibouti can serve military, political, industrial, and economic intelligence and counterintelligence management operations.

(Credits-<https://www.gatewayhouse.in/chinas-telecommunications/>&Chaitanya Giri, Fellow, Space and Ocean Studies, Gateway House)

Self-Driving Tanks and Swarms of Deadly Drones. In a propaganda footage released by Russia, an army of 'killer robots' that will assist infantry on the battlefield has been unveiled. The video appears to showcase Russia's latest drone technology. The robot technology possibly includes killer robots. These come in the form of cat-sized drones and AI-controlled driverless tanks. Presently, the robots will still require to be controlled by a human beings in the infantry. That includes the AI-controlled driverless tank that follows the aim of a soldier's rifle to obliterate targets with its own weaponry. However, in future the technology is expected to be fully autonomous implying that the military hardware will be able to target and kill enemies without any human intervention.

Comments. As per Russia's Advanced Research Foundation (ARF), the ultimate goal is to have an army of robots entirely controlled by AI algorithms. The evolution of combat robots is on the path of increasing the ability to perform tasks in autonomous mode with a gradual reduction in the role of the operator. What is of concern is the AI algorithms /logic which would be used by these machines to take a human life. Moreover, in the eventuality of such a machine being hacked and then taking a human life, it is not clear as to who would be responsible ie the agency/ nation owning the machine or the one who manufactured /programmed it or the one who hacked it?

(<https://www.dailymail.co.uk/sciencetech/article-6839445/amp/Self-driving-tanks-swarms-deadly-drones-developed-Russia.html>)