



Defense Technology Monitor No. 33

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Related Categories: Arms Control and Proliferation; Cybersecurity and Cyberwarfare; Democracy and Governance; Intelligence and Counterintelligence; Military Innovation; Missile Defense; Science and Technology; Russia

THE CASE FOR WEAPON-DETECTING WI-FI

Guarding against terrorist attacks is extremely difficult in large public areas, where airport security-style X-rays or CT scanning points of entry are impractical. Researchers from Rutgers University-New Brunswick are working to address this problem, and have developed a possible alternative or complement to manual bag checking in stadiums and large public venues. According to their study, Wi-Fi signals can be used to detect weapons consisting of liquid or metal that are carried in bags. Wi-Fi signals easily pass through bags and materials used to conceal weapons, but interference patterns register when the signal hits metal or liquids. With accuracy rates already in the high 90th percentile, researchers are now attempting to hone results so as to determine the exact dimensions of objects and volume of liquids, so the technology can be perfected and disseminated widely to protect large public areas. (*Futurism*, August 16, 2018)

PENTAGON SEEKS SPACE SENSORS TO COUNTER HYPERSONICS...

The U.S. Department of Defense faces a monumental problem as it attempts to detect and track hypersonic weapons. The hypersonic weapons under development by Russia and China travel between five and twenty times the speed of sound, and can be launched from land, sea, or air across the globe, making the ability to promptly alert a defensive system capable of countering the threat essential. Space-based sensor systems are the only feasible method of detection; however, current military constellations do not have broad enough global coverage, and the cost for additional capabilities is prohibitive. Because the private sector has consistently driven down the cost for satellite launches, Pentagon officials are now looking at potential private sector solutions to the problem. The effort makes sense - but also carries risks. For instance, augmenting the military's ability to detect and track hypersonic weapons by adding sensor packages to commercial satellites has definite potential, but it also leaves satellites open to attack by foreign entities during wartime. (*Popular Mechanics*, August 16, 2018)

...AND EYES INTERCEPTION OPTIONS

As the U.S. military increasingly thinks outside the box about solutions for tracking hypersonic weapons, the logical next step is to develop a method by which to intercept them. Congress is concerned that the Missile Defense Agency (MDA) has not yet developed the capability to intercept hypersonic weapons or intercontinental ballistic missiles (ICBMs) in their boost phase (the period during and shortly after launch). One of the most promising methods to counter the threat is through a directed energy weapon, like a megawatt laser that travels at the speed of light and has enough power to destroy a large missile. At this time, such lasers are still too large to package on a satellite, drone, or an F-35 fighter. But Pentagon officials believe a megawatt laser on these various platforms can be achieved within the next decade. (*Next Big Future*, August 15, 2018)

RUSSIA'S CHAMELEON COMBAT FORCE

The Russian military is experimenting with a new type of "stealth camouflage" technology that provides soldiers, and even vehicles, with the ability to match their surroundings. The chameleon-like body armor was developed as part of the multi-year *Ratnik* project, which seeks to upgrade the equipment of Russian Ground Forces and is developed by the Rostec defense conglomerate. The company's CEO, Sergei Chemezov, is quoted as saying that the stealth technology "can reflect color changes and imitate complex graphical depictions, up to the leaves wavering in the wind." The mechanics behind the technology are unknown, except that it is operated electronically. Due to the technology's high cost, it is likely that only Russia's special forces, or *spetsnaz*, will benefit from the upgrade. (*Popular Mechanics*, August 20, 2018)

HOW AI AIDS ELECTRONIC WARFARE

The prevalence of electronic warfare and the growing sophistication of U.S. adversaries, particularly Russia, is evident in conflict zones like Syria and Ukraine. There, advanced electronic warfare capabilities have successfully disrupted communications and drone control. Accordingly, the U.S. Army's rapid capabilities office is now working to find better ways of de-conflicting electromagnetic signals using commercial technology - and using competition to do so. In a recent award contest, the winning team of 49 competitors received a grant of \$100,000 to create algorithms relying on artificial intelligence to more easily discriminate between friendly transmissions and enemy signals on the battlefield. (*Space News*, August 29, 2018)

