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Related Categories: Cybersecurity and Cyberwarfare; Democracy and Governance; Energy Security; Military Innovation; Missile Defense; Science and Technology; Russia; Ukraine

WIRELESSLY CHARGING DRONE SUBS

Wireless charging is becoming ubiquitous due to the popularity of technologies such as smartphones and tablets that have adopted the capability. Officials in the U.S. Navy have taken note of this trend, and decided to adapt the inductive charging concept to fuel underwater drones. The Navy increasingly utilizes unmanned underwater vehicles (UUVs) for a broad range of missions, "including reconnaissance, mine hunting, ocean floor mapping and anti-submarine warfare." However, the electric propulsion systems on UUVs require the drones to return to their human operators for charging. Several years ago, however, the Navy's Space and Naval Warfare Systems Center Pacific demonstrated that commercial wireless charging technology continued to work under several feet of water, setting the stage for military applications of the concept.

The results have not been long in coming. Recently, in a July demonstration, researchers successfully charged a research UUV from an underwater wireless charging station. As a result, the next generation of naval UUVs could be far more capable and wider ranging, as this new wireless charging technology is increasingly implemented. (*Popular Mechanics*, August 29, 2017)

THE PENTAGON'S NEW EW STRATEGY

As electronic warfare technology development accelerates globally and Russia demonstrates increasingly advanced EW capabilities in Ukraine, the Pentagon has re-conceived its own approach to the issue. The result is a new strategy document that emphasized agility and adaptability in the procurement of offensive EW technologies, as well as the imperative of securing vital aspects of modern warfare (including satellite communications, ISR capabilities, and drones) from opponent hacking or jamming attacks. The strategy also aims to prepare the military for the future, calling for improved modeling and simulations to practice defense against future technologies not yet in use. (*Defense Systems*, September 6, 2017)

RECONSIDERING "RODS FROM GOD"

For decades, science fiction writers have dreamed of kinetic bombardment weapons that use gravity to propel projectiles from orbit onto the surface of the earth at incredible velocities. The U.S. government has repeatedly contemplated creating a real version of such a capability - originally proposed by a Boeing engineer named Jerry Pournelle and dubbed "Project Thor." Project Thor, also known as the "rods from God" concept, envisioned dropping a solid tungsten rod the size of a telephone pole from orbit in order to penetrate far deeper into hardened targets than conventional or nuclear warheads could, and with no nuclear fall-out.

While originally deemed too expensive to be viable, the concept was revisited and reevaluated during the George W. Bush administration. Today, hardened subterranean facilities in rogue states pose a problem for conventional warheads, and kinetic energy weapons that deliver a penetrating projectile, such as railguns or orbital drop weapons, are frequently discussed as solutions. As space launch costs continue to decrease as a result of marked competition, such initiatives may become increasingly attractive and economically viable. (*Business Insider*, September 7, 2017)

THE HAZARDS OF HACKED ROBOTS

While innovator and entrepreneur Elon Musk has raised the alarm over the possibility of "Terminator" style rogue computer threats, Australian cyber security professor Nick Patterson predicts a much more intimate risk from such systems. In the future, Patterson warns, hackers could reprogram sex robots to extort or harm users, catching them quite literally "with their pants down." Many robots today lack the sophisticated layers of defenses possessed by modern consumer computers and phones, making them comparatively easy for malicious hackers to compromise.

The threat extends beyond sex robots. Welding, cutting, and gripping robots could all cause serious harm to human operators unaware that the robot has been compromised and reprogrammed. As robots become more and more ubiquitous, both manufacturing and home, additional measures need to be taken to secure their vulnerable systems from being used by malicious hackers. (*New York Post*, September 11, 2017)

NEW MILITARY APPLICATIONS FOR AI

The Pentagon believes that artificial intelligence could be the next major revolution in warfare, and a variety of projects have sprung up in recent years applying AI to military problems. One common idea across services: to use AI to help disarm explosives and keep humans as far away as possible from explosive dangers. Improvised explosive devices are popular weapons used by insurgents in many conflict zones. Explosive Ordnance Disposal experts have been combatting them for over a decade, and they hope AI can significantly reduce the risk to humans. Machine learning and neural networks could help AI sort through a mountain of data on past IEDs and identify bomb related components using autonomous reconnaissance robots. Similarly, the Navy hopes that machine learning systems in UUVs could help mine hunting robots to assist in clearing harbors. (*National Defense*, September 18, 2017)