



DEFENSE TECHNOLOGY MONITOR

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Related Categories: Military Innovation; Science and Technology

BIRDS AREN'T REAL?

Unmanned aerial vehicles typically include classifications like drones and autonomous aircraft. However, scientists from New Mexico Tech are going a bit further – and repurposing dead birds for UAV duties. Crafting wings akin to those of birds has traditionally proven to be a challenge for researchers, so the scientists are going a different route, and augmenting deceased, taxidermied birds with surveillance tools. The process, though unorthodox, has clear dividends, among them the potential to create less conspicuous monitoring technology. (*Popular Mechanics*, February 16, 2023)

SUPER SOLDIERS, RECONSIDERED

Back in 2018, Chinese scientist He Jiankui ignited an international firestorm when he announced that he had used CRISPR-Cas9 to alter the genetic makeup of three children in a bid to make them resistant to HIV through the removal of the CCR5 gene — a gene that has also been linked to increases in cognition. While it's unclear if Dr. He was attempting to create super-intelligent humans, the topic could be explored with future research. According to scientists who participated in the 2023 International Summit on Human Genome Editing, the military applications of the field are wide-ranging, and might include "modifying liver enzymes to make men and women better able to rid their bodies of toxins used in chemical warfare" or making subjects "more resistant to biological weapons." Other enhancements, such as improving vision to allow subjects to see in the infrared or the ultraviolet spectrum, as some animals are able to, is also a possibility. In turn, "[s]uch enhancements would be ideal for troops fighting at night or in other hostile conditions." (*The Guardian*, February 5, 2023)

CHINA'S PHANTOM SPACE STRIKE

In addition to developing hypersonic missiles capable of evading missile defenses, China is also seeking ways to confuse such systems. To that end, the Chinese military is reportedly working on a "phantom space strike" capability that involves emitting fake target signals from space to overwhelm enemy air defense radars. People's Liberation Army Unit 63891 recently ran a simulation in which a non-nuclear ballistic missile deployed three satellites shortly after leaving the atmosphere. The three satellites each host payloads of radio interference equipment capable of sending "phantom" signals to adversary radars, tricking them into launching unnecessary interceptors to attack multiple fake missiles. The objective of the system is to encourage enemies to waste expensive interceptors chasing a non-existent threat. However, it's unclear how well it will work on near-peer adversaries, since some advanced missile defenses incorporate advanced target discrimination capabilities. (*The Eurasian Times*, February 23, 2023)

AI WINGMAN TAKES FLIGHT

As Artificial Intelligence (AI) becomes a major disruptor in military hardware, autonomous aerial vehicles are poised to make big waves. In December 2022, the Pentagon's Defense Advanced Research Projects Agency (DARPA) successfully demonstrated that AI algorithms developed over the past three years in a simulated environment can autonomously control a real-world full-scale F-16 fighter jet with little to no human input. The algorithms were developed as part of DARPA's Air Combat Evolution (ACE) program, and the software was loaded onto modified F-16 fighters at the Air Force's Test Pilot School at Edwards Air Force Base in California.

Relatedly, the Test Pilot School is also running simulations to determine how much trust human pilots are likely to have in the AI wingman. The dividends of the trials are potentially huge; the fusion of human piloting paired with an AI-flown fighter jet can revolutionize the way in which aerial combat is executed, and allow human pilots to monitor overall battlefield strategy and the AI to handle some of the dogfighting. (DARPA, February 13, 2023)

THE PRC'S STEALTH BOMBER GETS AN UPGRADE

The B-2 Spirit stealth bombers have been the envy of America's adversaries for years. With an iconic tailless, all-wing design, the strategic bomber has the capability to invade enemy airspace undetected due to its low-radar cross section—though its design has limitations as a result of poor aerodynamics. Now, a team of Chinese researchers has identified a new wing design with both a reduced radar profile and enhanced flight capability. The new design does not rely on mechanical ailerons. Rather, it harnesses compressed air from the jet engine's compressor turbine and an actuator below each wing to distribute the air around the wing to control the pitch and banking maneuverability. The development is significant, because a reduction in mechanical parts will allow the craft to maintain a low radar cross-section. (*South China Morning Post*, February 8, 2023)