



NATIONAL SECURITY
INNOVATION NETWORK
A Defense Innovation Unit Component



Obstacle Navigation Redefined US Army 18th Airborne Corp

CHALLENGE

Army Breachers who need to navigate and clear complex battlefield obstacles cannot reduce risks to human life due to the dangers and delays of manual breaching, such as stepping on the booby traps, and the limitations in autonomous capabilities.

RELEVANT CONTEXT

- Army breachers, infantry, and special operations operators face significant risks when navigating and clearing complex battlefield obstacles, such as anti-tank mines, pressure-activated anti-personnel mines, concertina wire, and dragons' teeth barriers.
- These operations often occur in semi-permissive environments characterized by nuclear, biological, or chemical threats, the absence of air superiority, and high electronic warfare activity.
- Currently, combat engineers conduct these operations using vehicles, explosives, and personnel to penetrate defensive fields, exposing soldiers to extreme danger. These defenses are designed with layers of obstacles to delay or deny movement, making the process time-consuming and hazardous.
- An autonomous breaching capability could revolutionize this process by detecting, navigating, and clearing obstacles without putting soldiers in harm's way. Such a system would need to function autonomously in a disconnected state, adapting to changing environments and scenarios in real time. It should include decision-making capabilities that allow it to adjust its course and collaborate with other autonomous systems toward a shared objective.
- This capability could incorporate advanced sensing technologies, such as chemical or biological sensors, to monitor complex environments and ensure safe operations. By automating these tasks, the Army could significantly reduce the number of soldiers needed to physically clear mines and other obstacles, preserving human life while maintaining operational effectiveness.

IMPACT

If this problem were solved, autonomous systems could safely and efficiently clear complex battlefield obstacles in high-risk environments, reducing reliance on human breachers and minimizing risks to soldiers' lives.

POTENTIAL BENEFICIARIES

Infantry Units, Special Operations Forces, Joint Task Forces, Mine-Clearing Teams, Explosive Ordnance Disposal (EOD) Teams, NATO Allies, and First Responders

TEAM RECOMMENDED SKILLSETS

Mechanical Engineering, Systems Engineering, Computer Science, Cybersecurity, Data Science, Information Systems, Software Engineering, International Relations, Electrical Engineering, Computer Engineering