



U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND ARMAMENTS CENTER

Soldier Perspectives in AI and Autonomous Systems

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ABSTRACT

- Artificially intelligent autonomous systems are a growing component of the Army's battlefield assets.
- However, there is a realization that design of these systems, especially armaments, must incorporate the user's perspectives.
- These perspectives include desired features, concept of operations, limitations on the intelligence and autonomy of the system.
- DEVCOM Armaments Center's Tactical Behavior Research Laboratory gathered information from over 130 Soldiers about their insights into artificial intelligence and autonomous weapons in operations.

1. Trust is Context-Dependent, Not Universal

Soldiers did not apply a single level of trust across all autonomous systems. Trust varied by system type, mission role, and operational tempo.



Implication: Trust evaluations must be mission-scoped, not generalized across system categories.

2. Transparency and Predictability Drive Trust

Across all three experiments, Soldiers consistently emphasized the importance of knowing what the system is doing and why. Systems that failed to signal intent or reacted in unpredictable ways were quickly distrusted—even if technically functional.



Implication: Effective autonomy requires user-facing transparency mechanisms—visual, auditory, or behavioral—that explain system state, logic, and next actions.

3. Trust is Built Through Exposure and Use

Repetition, familiarity, and hands-on use were shown to significantly influence trust calibration.

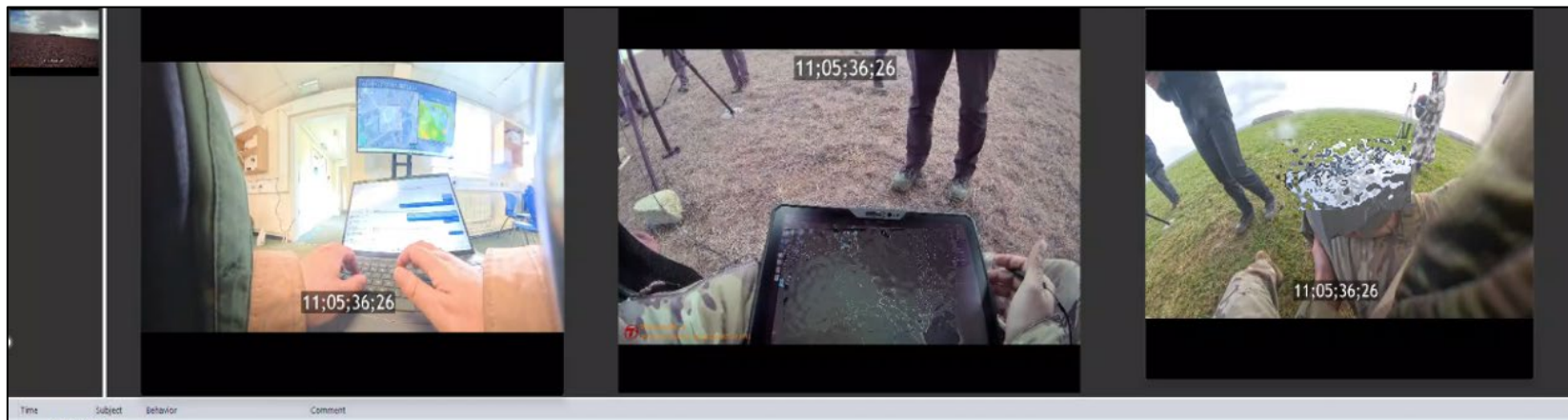


Implication: Trust is trainable and experience-driven; early and sustained exposure should be a core component of AI system fielding.

4. Overtrust and Distrust Are Both Operational Risks

Both over-reliance (assuming the system is always right) and under-utilization (avoiding use due to skepticism) led to degraded mission performance.

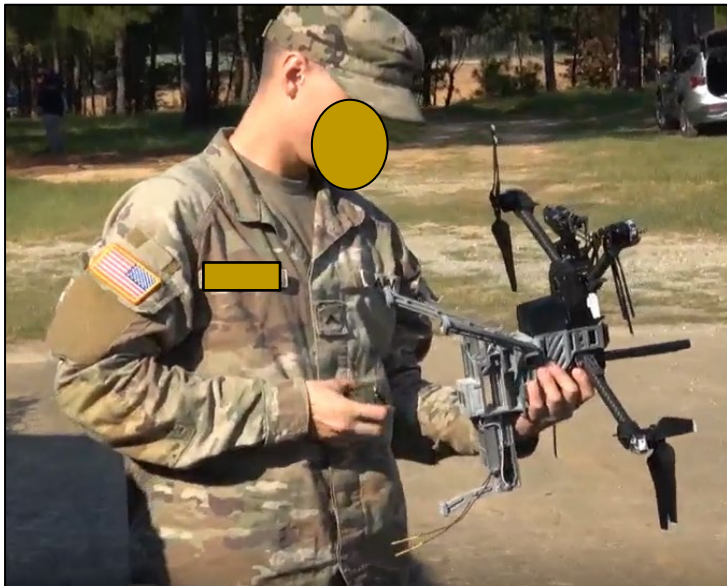
Implication: Trust calibration—not just trust—is the target. Interfaces, feedback loops, and SOPs must help Soldiers assess when trust is warranted.



5. Role Clarity Enhances Human-Autonomy Teaming

When Soldiers understood the specific purpose and tactical role of autonomous systems, their coordination, usage, and confidence improved. Lack of clarity in autonomy scope or command handoffs led to friction.

Implication: Future system deployment should include explicit role framing and usage boundaries to reduce uncertainty and improve teaming efficiency.



6. Interface Design Directly Affects Trust

Poor interface design—particularly related to feedback latency, control ambiguity, or sensor clutter—negatively impacted trust behaviors. Soldiers

reported difficulty discerning system mode (manual vs. autonomous) or understanding sensor input relevance.

Implication: Interface usability is not cosmetic—it is a core trust enabler. Design must prioritize intuitive control and meaningful status cues.



THANK YOU.

