DEFENSIVE AI IN NATIONAL SECURITY

The Implication of Autonomous Weapon Systems in Modern Warfare

A Comprehensive Analysis of Technological Superiority, Ethical Governance, and Realist Policy Frameworks

ATHRAA ALEZZI | SYP CONFERENCE 2026

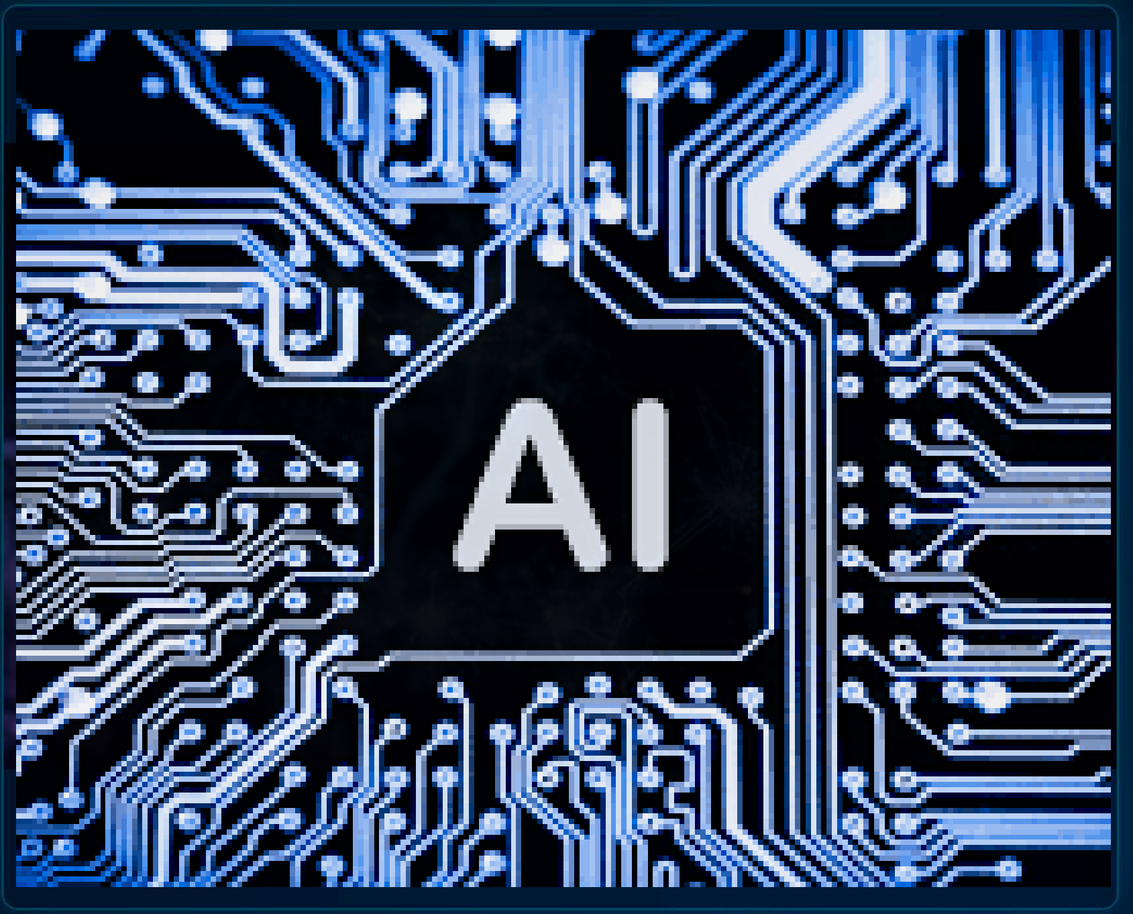
THE FOUNDATIONS OF AI SYSTEMS

THE COGNITIVE PROCESS

Artificial technology mimics nature by replicating the **Cognitive Process**: interacting with environments, paying attention to variations, analyzing data, and storing experiences as actionable information.

This allows for **Machine Learning (ML)**, where algorithms enable adaptive behavior without manual hard-coding. Key distinctions include:

- **Neural Computing (NC):** Mimics human learning "by example," enabling flexible pattern recognition.
- **Classical Computing (CC):** Operates strictly "by rules" and predefined manual commands.



DEFINING AUTONOMY IN WARFARE

ICRC WORKING DEFINITION

The International Committee of the Red Cross defines **AWS** as any system with autonomy in critical functions—searching for, identifying, and attacking targets without human intervention.

GOVERNANCE CHALLENGES

Terminology remains contested. Defining "autonomy" is the essential first step toward effective policy. Without consensus on what constitutes self-governing behavior, international regulation remains fragmented and toothless.

THE AWS TAXONOMY

PERFORMANCE DOMAINS

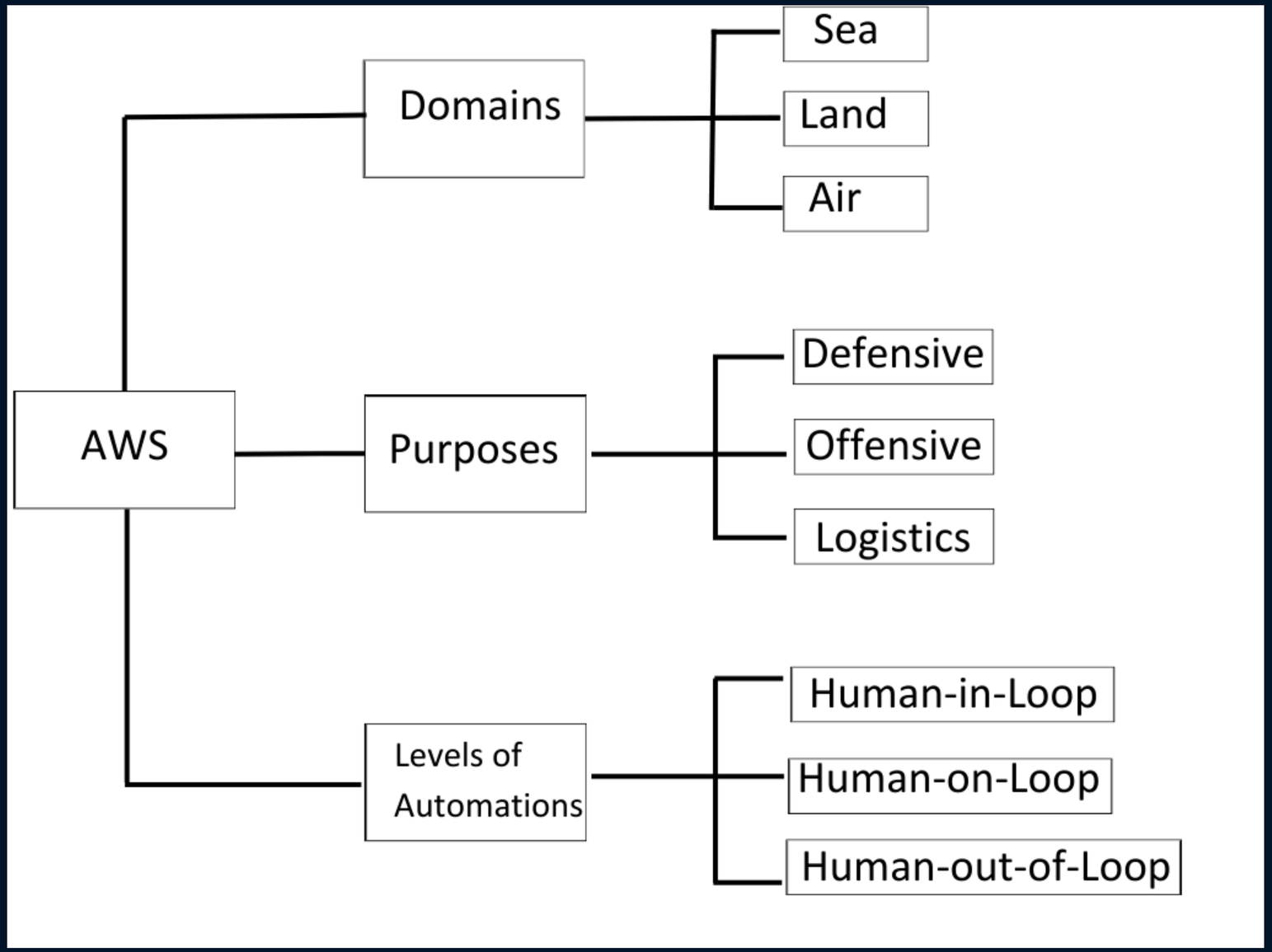
Unmanned systems operate across a 3D tactical space: **Sea** (UUVs/USVs), **Land** (UGVs), and **Air** (UAVs/Drones).

STRATEGIC PURPOSES

Systems are value-laden based on intent: **Defensive** (protection), **Offensive** (engagement), or **Logistical** (support).

AUTOMATION LEVELS

The degree of human oversight: **Human-in-Loop**, **Human-on-Loop** (supervision), or **Human-out-of-Loop** (autonomous).


AWS
Domains
Sea
Land
Air
Purposes
Defensive
Offensive
Logistics
Levels of Automations
Human-in-Loop
Human-on-Loop
Human-out-of-Loop

Human-in-the-Loop (Defensive purposes)

Flakpanzer Gepard

widely used to shoot down Iranian-designed drones and missiles

- **Fabricated in: Germany**
- **Deployed in: Ukraine**
- **War: Russo-Ukrainian War**
- **Role: Air defense against drones and aircraft**
- **Human control:**

A human operator identifies and authorizes targets

Fires are not autonomous

Human-on-the-Loop
(Logistic / support purposes)

Sting drone

300 km/h
10–15 km

- **Fabricated in: Ukraine**
- **Deployed in: Ukraine**
- **War: Russo-Ukrainian War**
- **Role: Intercepting enemy drones**
  (supporting air defense logistics layer)
- **Human control:**

Operated via VR goggles

Can track/engage semi-autonomously

Human-out-of-the-Loop
(Offensive purposes)

Shahed-136

≈ $20,000 – $50,000 per drone

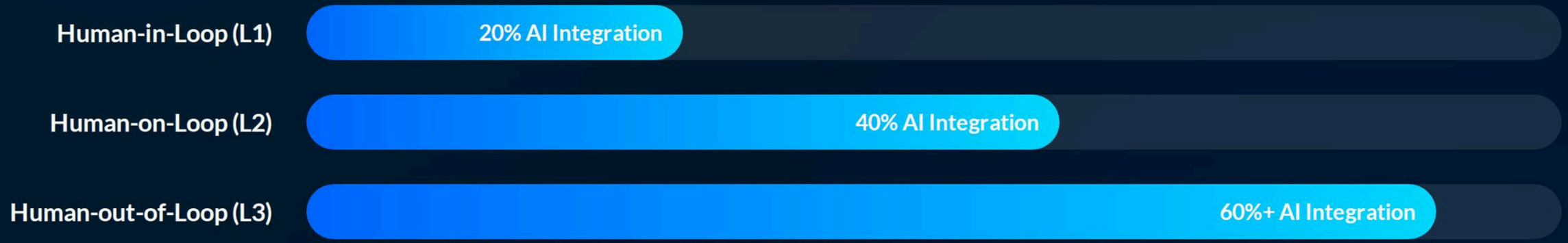
- **Fabricated in: Iran**
- **Deployed in: Middle East (US- Iran)**
- **Wars:**

  Russo-Ukrainian War + GAZA–Israel
- **Human control:**

Pre-programmed target coordinates

No human intervention during attack

THE LETHALITY–AUTOMATION CORRELATION



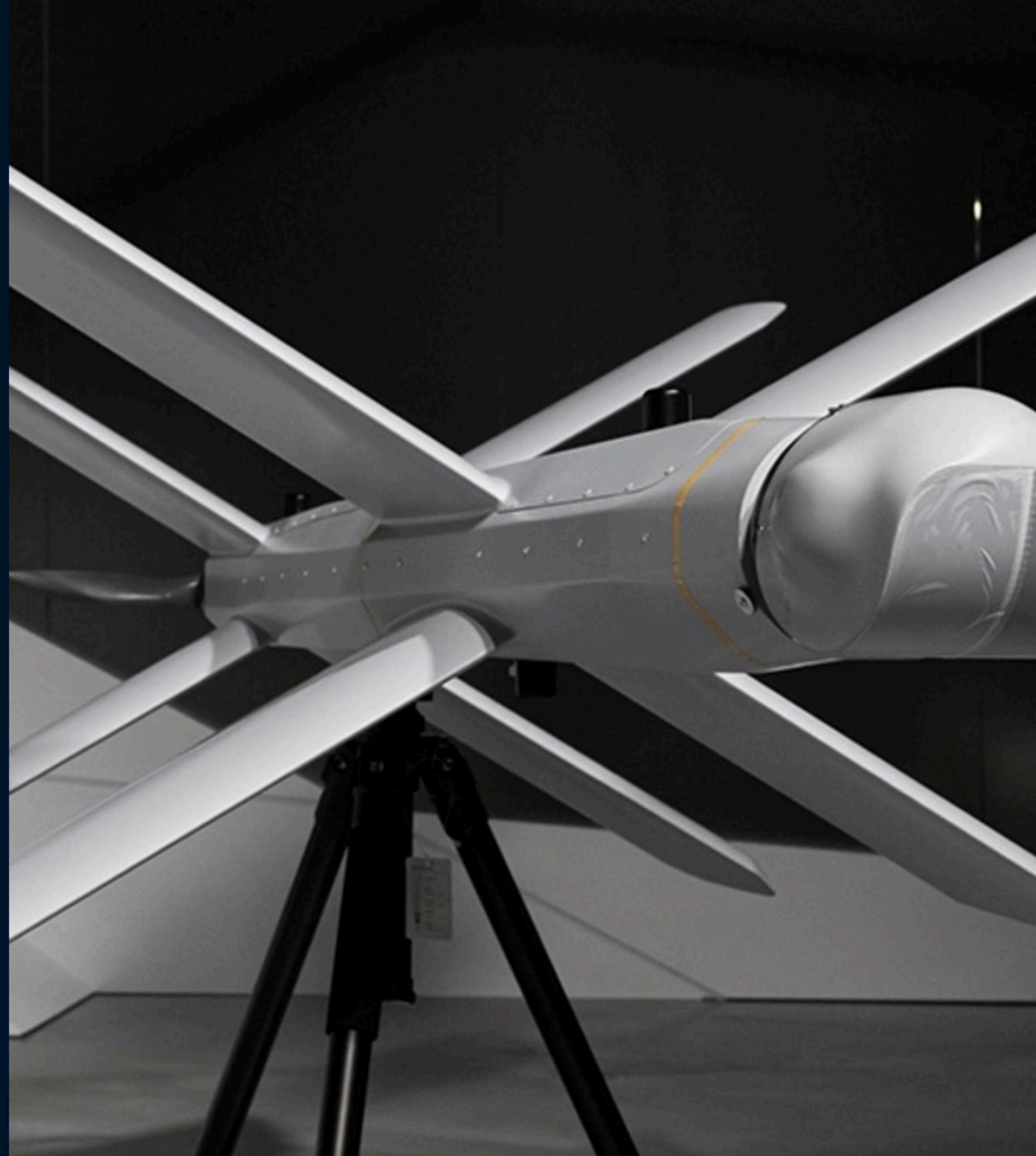
Thesis Insight: Higher reliance on AI correlates directly with increased lethality through precision, reaction speed, and autonomous target selection, effectively shifting defensive tools toward independent operation.

CASE STUDY: LOITERING MUNITIONS

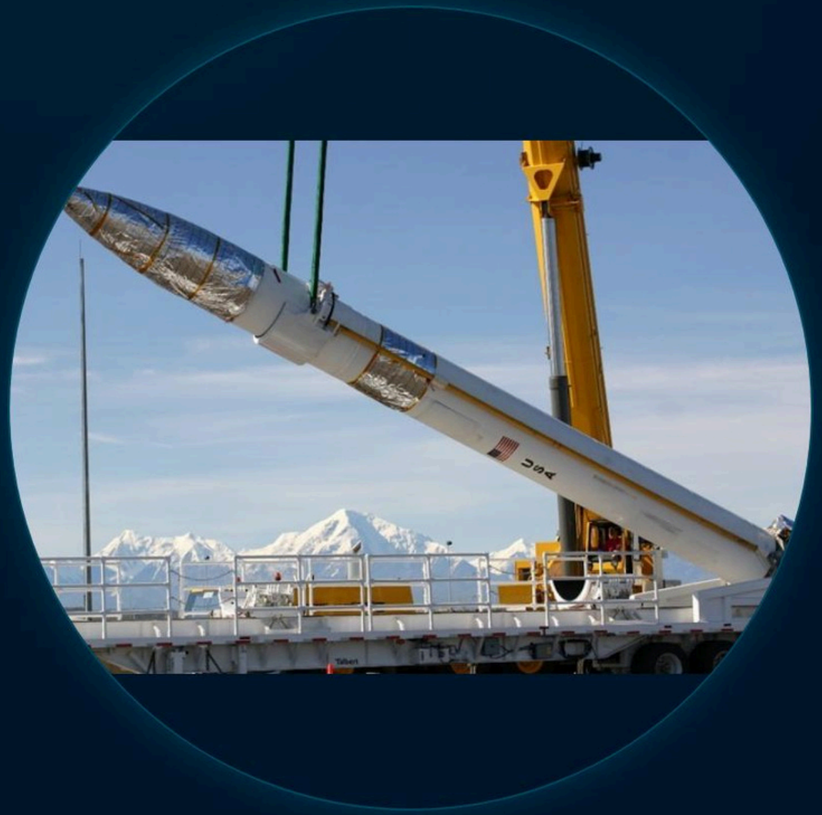
ZALA LANCET (RUSSIAN FEDERATION)

The Lancet represents the apical point of loitering technology, designated as "Kamikaze" or "Slaughterbots."

Classified as **Human-Out-Of-Loop**, it identifies and attacks targets autonomously with high-explosive warheads. Its deployment in the Ukrainian conflict underscores a paradigm shift toward precision-strike autonomous aerial assets.



CASE STUDY: DEFENSIVE GMD



GROUND-BASED MIDCOURSE DEFENCE

Unlike offensive drones, GMD is purely **Defensive**, designed to intercept ICBMs in the exoatmosphere before they reach the United States.

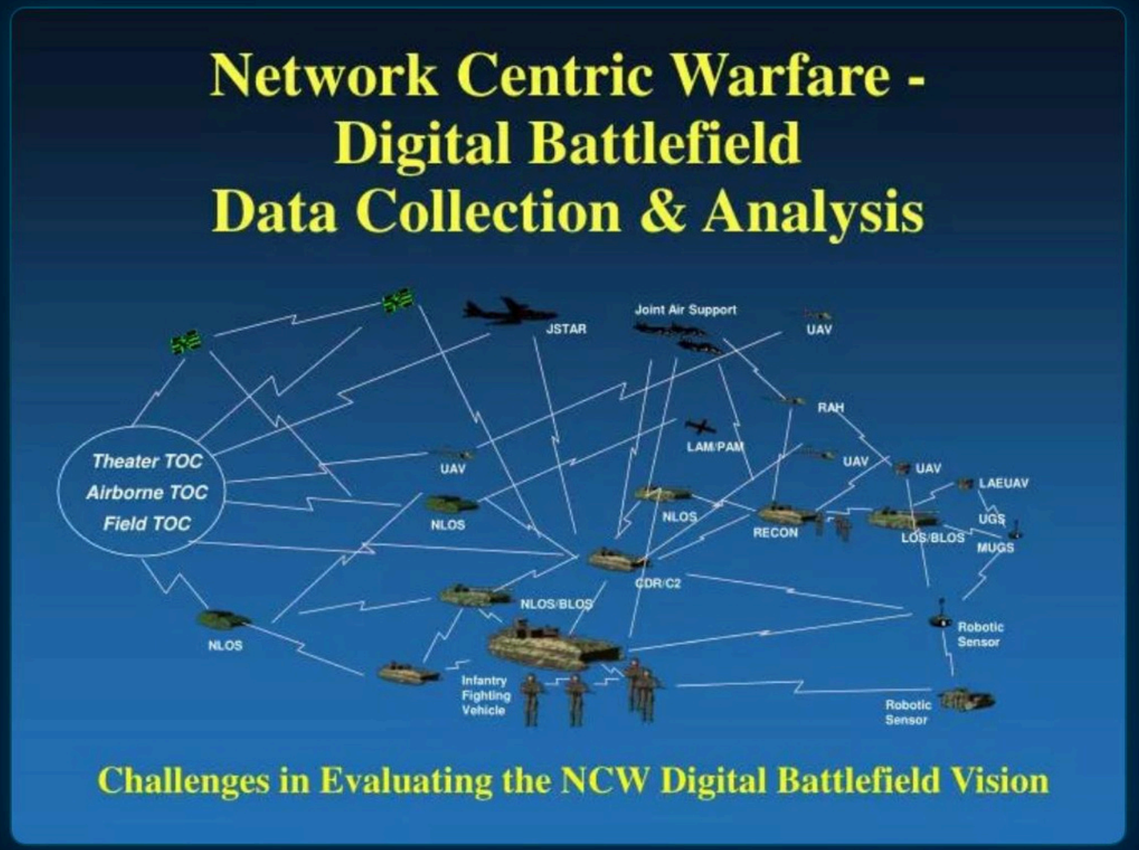
Operating under **Human-on-Loop** supervision, it boasts a 97% intercept probability (with 4 interceptors), demonstrating that AI-assisted defense significantly reduces human error in split-second strategic protection.

THE TECHNOLOGICAL LEAP

NETWORK-CENTRIC WARFARE

AI facilitates **C4ISR** capabilities, clearing the "Fog of War" introduced by Clausewitz. Key benefits include:

- **Rapid Response:** Processing data faster than any human operator.
- **Situational Awareness:** Real-time battlefield insights through multi-domain sensor fusion.
- **Force Protection:** Minimizing human exposure to "dull, dirty, and dangerous" missions.



ETHICAL GOVERNANCE IN WARFARE

"Man is a fighting animal, **emotional**, **passionate**, **illogical**. AWS lacking emotional interference are likely to keep the rules rigid.
— *Sir Norman Angell*

JUS IN BELLO COMPLIANCE

AI can strictly adhere to the principles of **Distinction** (civilians vs. combatants) and **Proportionality** without the emotional bias, panic, or "instinctive passion" that Sir Norman Angell noted in human fighters.

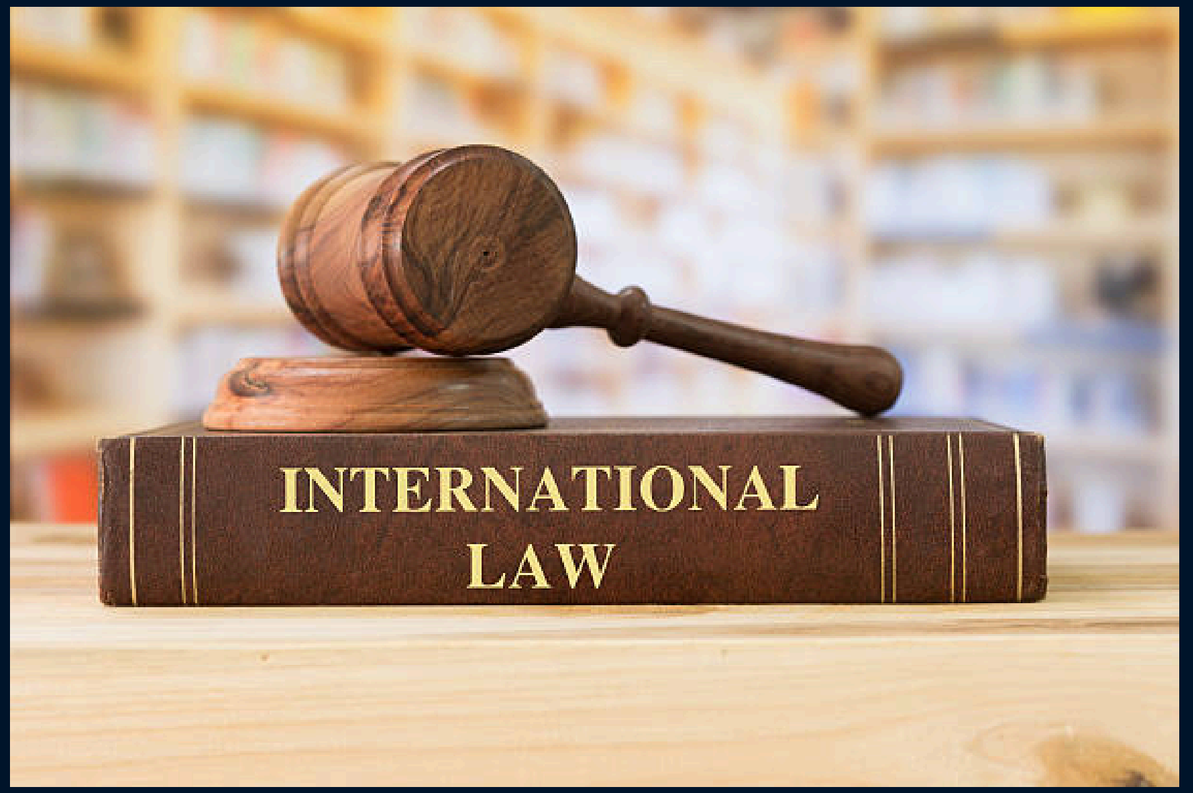
THE ACCOUNTABILITY ARGUMENT

While machines perform the task, **Strict Liability** ensures operators remain legally responsible. Regulation should focus on "control by design" to prevent unauthorized escalation and ensure deactivation safeguards.

JUS AD BELLUM: THE THRESHOLD

Legal and Moral Justification

Jus ad Bellum concerns the justification for going to war, rather than how the war is fought. Autonomous systems are fundamentally lowering the barrier to entry.



- **Lowered Costs:** Systems like the ***Shahed-136*** reduce financial and political barriers to initiating conflict.
- **Deniability:** Indirect drone strikes allow engagement without formal declarations of war.
- **Escalation Risk:** Visible in the Russo-Ukrainian War and Iran–Israel tensions.

THE REALIST PERSPECTIVE

> *The main foundations of every state are good laws and good arms; and because you cannot have good laws without good arms, where there are good ones, good laws inevitably follow.*

— Niccolò Machiavelli, The Prince (1532)

Thesis Conclusion: A total ban on AWS is ineffective and unrealistic. In a **Security Dilemma**, no rational actor will disarm while others innovate. Regulation must prioritize safety levels over impossible prohibitions.

FUTURE HORIZONS & REGULATION

RESPONSIBLE SCALING (RSP)

Applying AI Safety Levels (ASL) to categorize weapon risks, focusing on robust testing and data privacy rather than total bans.

5IR COLLABORATION

The Fifth Industrial Revolution promises a future of harmonious human-machine collaboration, where AI handles speed and humans handle empathy.

PEACEBUILDING POTENTIAL

Defensive AI, such as GMD or border surveillance, can create new opportunities for deterrence that prevent conflict escalation entirely.

QUESTIONS?

Thank you for your attention.

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