



# **LEVERAGING ARTIFICIAL INTELLIGENCE (AI) TO ENABLE DECISION SUPERIORITY**

**Timothy Stewart**

# Decision Superiority and JADC2

## 21<sup>st</sup> Century Conflicts and Modern Warfare

- Importance of new technologies globally
- Processing information faster than adversaries
- Achieve information advantage



Photo credit: United States Department of Defense (DoD)

## JADC2: Joint All Domain Command and Control

Integrates advanced technologies across all domains

- Artificial intelligence (AI)
- Machine learning (ML)
- Autonomous operation

# Shared Intelligence

## Collaboration Crucial to Achieve JADC2 and Interoperability

- Project Convergence 2022
- Anti-Access/Area Denial (A2/AD)

## Identify Technological Challenges

- Address degraded space-based assets
- Leverage AI/ML capabilities with human interfaces

## Technical solutions

- Industry
- Academia
- Coalition partners

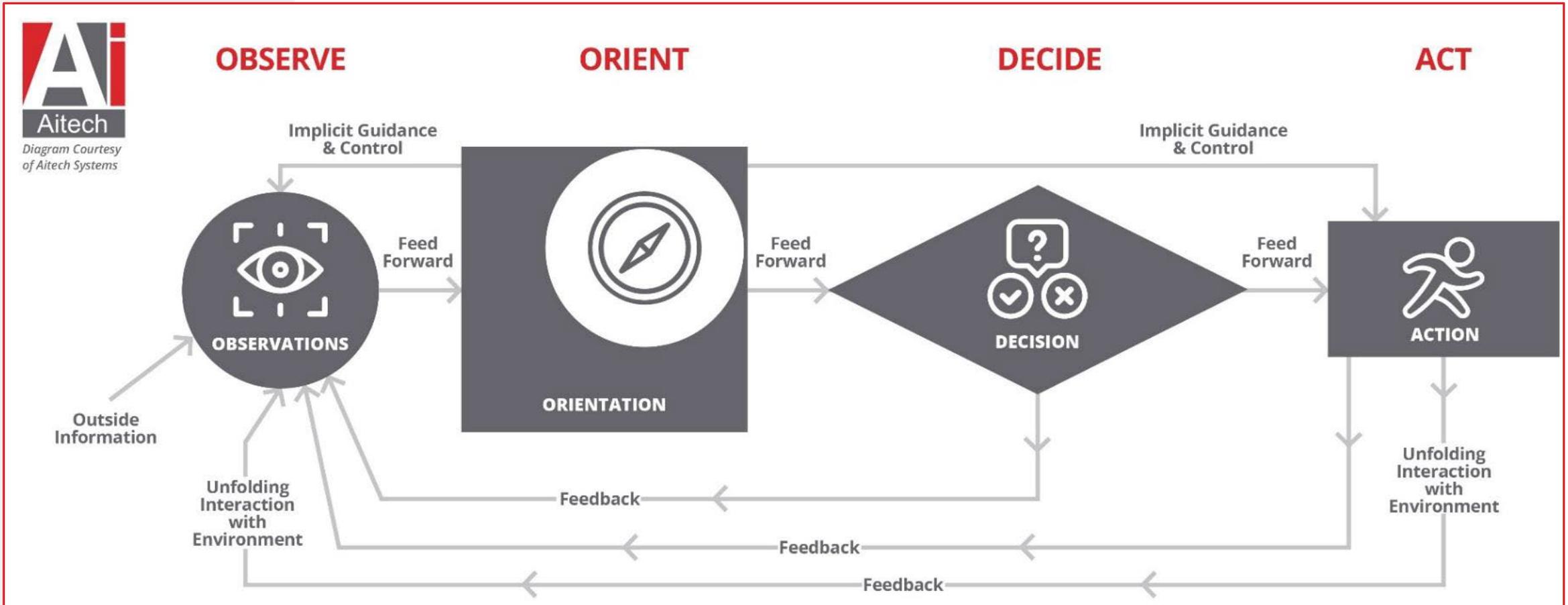


# Technological Challenges

- Specific decision superiority methods not clearly outlined
- Enterprise-wide approaches in multi-domain operations
- Make vast amounts of data actionable through distributed sensors
- Stakeholders at different levels access different elements for mission execution
- Cybersecurity across tactical networks



# OODA Loop: Observe, Orient, Decide, Act



# Analyzing Risks

## Analyzing Risks Involves

- Utilization/requirements for uncrewed systems
- Secure data transmission
- Interoperability challenges

## Failure to Address Can Mean

- Casualties
- Mission failure
- Disruption of operations



### **Military:**

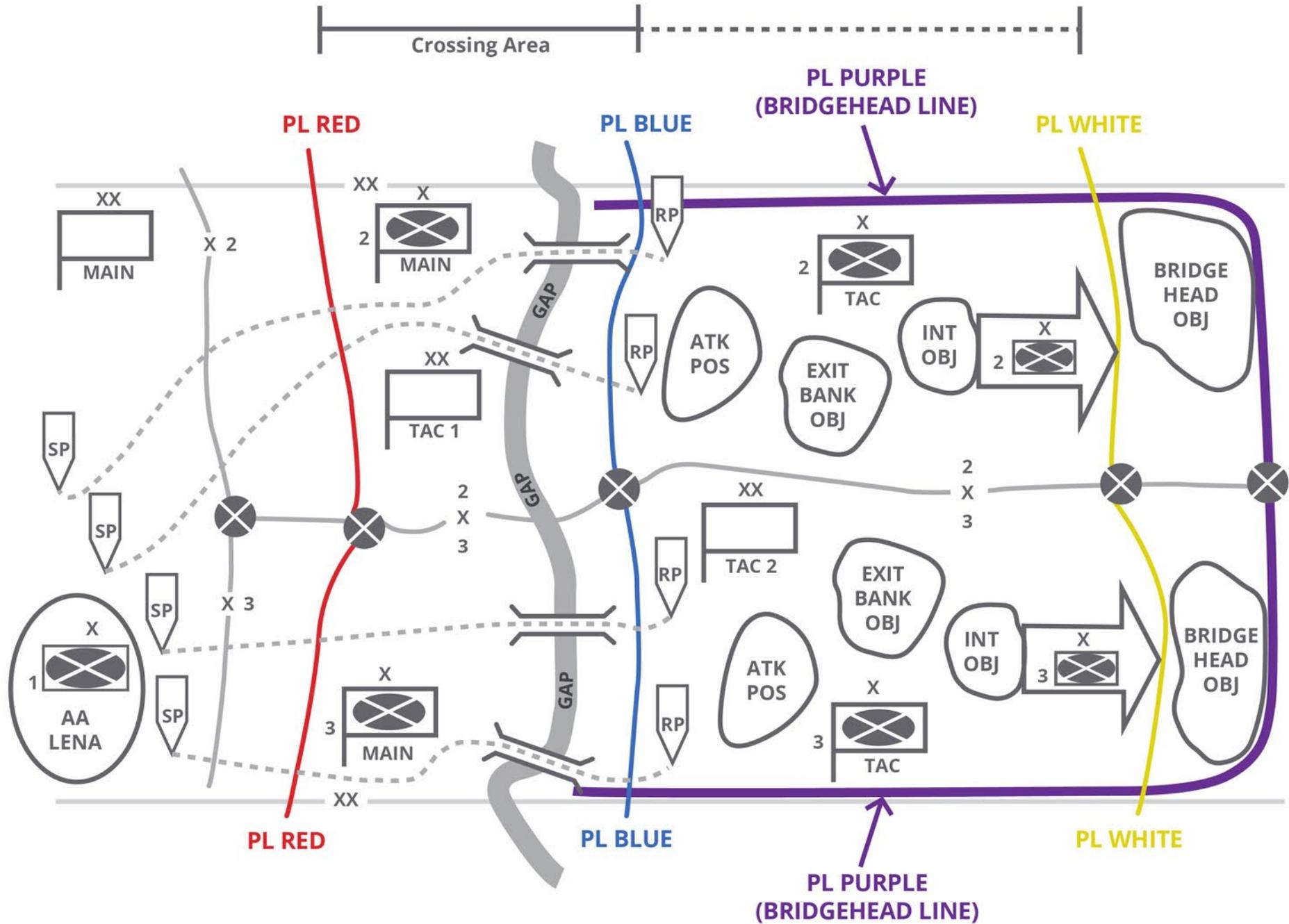
Wet Gap Crossing Analysis

### **Space:**

Ground Asset Analysis



Diagram Courtesy of Aitech Systems



# Optimizing Ground Vehicle Operations

## AI at the Edge (AIAE)

Process data across the OODA Loop

## Time Sensitive Networking (TSN)

Deterministic communication

## Enhanced Cybersecurity

Prevent cyber and spoofing attacks



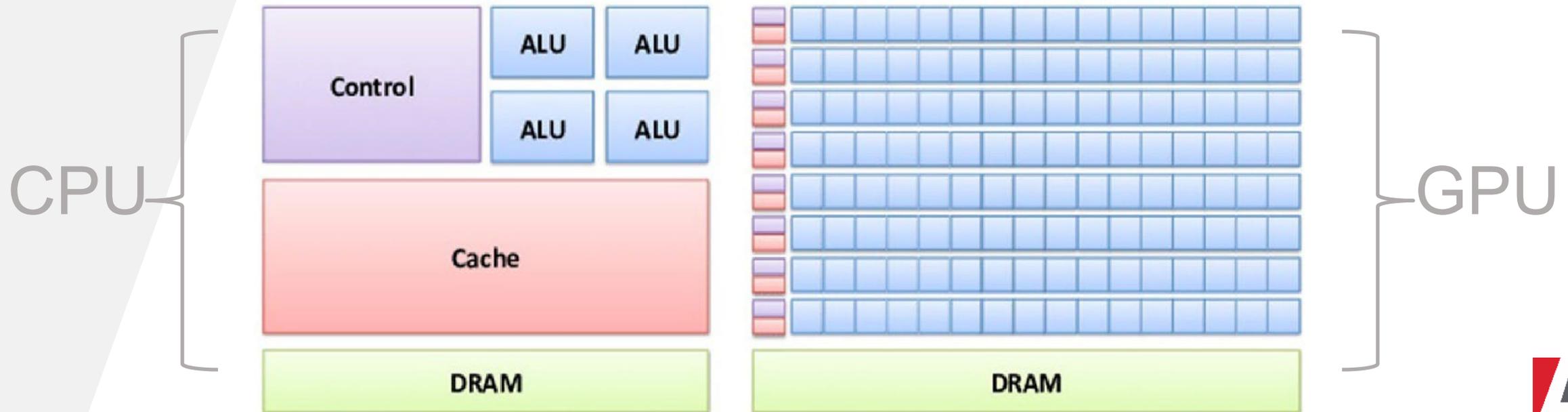
# Enabling AIAE Processing: GPGPUs

## Wide Use of GPGPUs in AI

- Parallel processing power
- Handle large amounts of data
- Improve decision making speed

## AI Supercomputers Near Sensors

- Reduce latency
- Eliminate data transfer
- E.g. – NVIDIA Jetson family



# Enabling AIAE Processing: Time Sensitive Networking (TSN)

## Holistic Operational View

Well-informed, timely decisions based on accurate, relevant data

## Ethernet Connectivity

## Deterministic Transmission

## Enhanced Situational Awareness

- Real-time, synchronized operational environment
- Detect anomalies

**Make Informed Decisions with Confidence**



# Enabling AIAE Processing: Cybersecurity



## Enhanced safeguards

- Prevent attacks
- Protect information sharing data links

## Improve C2 communications

## Effective data sharing

Through redundancy, synchronization, interoperability

## Significantly Reduce Shared Data

Across tactical networks by processing more at the source

## Simplify Data Distribution Efforts

Allocate proper information to each data user

# Conclusion

- Faster digital transformation, prototyping and systems integration by:
  - Leveraging existing data
  - Fostering experimentation and learning for success
- Continued collaboration between industry and the DoD will help achieve the JADC2 vision quicker
- Employing AI/ML and advanced algorithmic systems provides a significant advantage in achieving decision superiority for both military and space industries



# Thank you for listening.

**Aitech**  
Questions?

Timothy Stewart  
Director, Business Development  
925-922-9801  
[tstewart@us.aitechsystems.com](mailto:tstewart@us.aitechsystems.com)  
<http://www.aitechsystems.com>

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