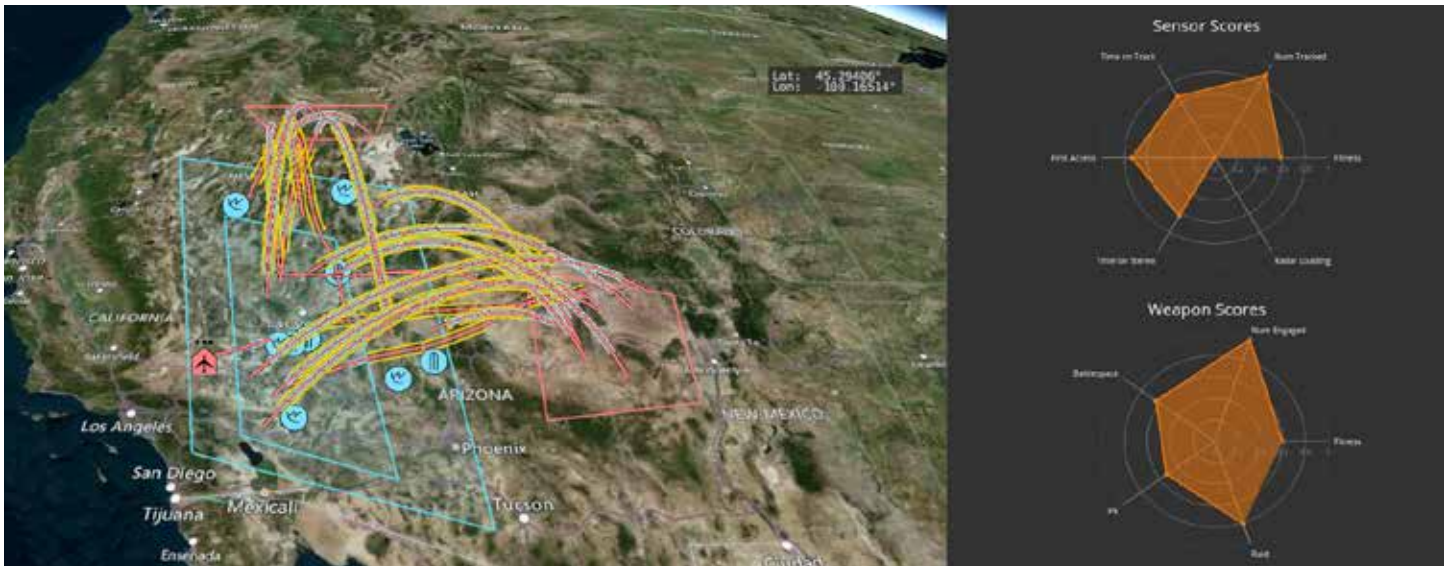


AI-based battle manager incorporates changing environments while optimizing globally across the duration of the battle.



OVERVIEW

Complex military battles create a serious problem for the warfighter. Traditional battle managers are limited to homogeneous or similar weapon systems, with significant cost and schedule requirements to incorporate new sensors, weapons and threats. Further limited by non-optimal algorithms plus decoupled sensor and weapon tasking, these systems place a high cognitive load on the operator to create potential for human error in the “fog of war”. Legion™ is a AI-based battle manager to address these issues by leveraging innovative deep learning algorithms to accept and process large amounts of data with no operator burden. This allows globally optimized, collaborative sensor and weapon tasking across dynamically changing environments for the duration of the battle. By managing heterogeneous sensors, weapons and threats, Legion exploits all available knowledge for cohesive solutions while reducing human errors caused by stressful environments.

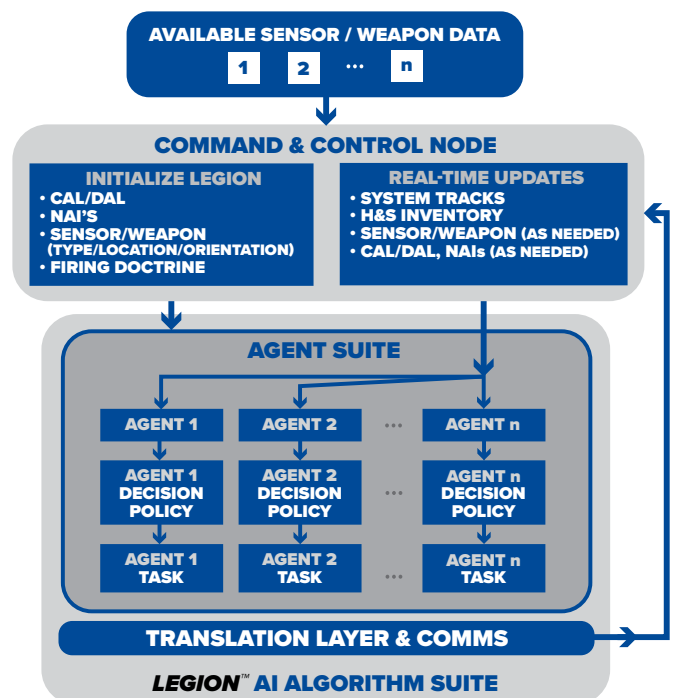
TECHNICAL

Legion is a suite of AI agents trained on numerous simulated battles against enemy COAs (ECOAs) to provide operational payoff in all measures of performance including reduced inventory usage and reduced cost per kill.

Reinforcement Learning – Builds optimal decision policy based on actions and rewards during training.

Specialized Expert Agents – Trained for optimal performance on specific weapon and sensor elements that make decisions for their element in support of optimal system performance.

Visualization – Scenario Builder allows the user to view areas, threats and scenarios, to execute scenarios and then playback for analysis.



Legion™ Advanced Battle Manager

Exploits **multi-agent** deep reinforcement learning (DRL) algorithms

- Individual agents break complex problems into manageable parts and distribute load among agents
- Simplifies tasks for efficient training
- Collaborative tasking through individual processing of shared information
- Modular and extensible - avoids large monolithic algorithm

Exploits **DRL** for global optimization

- Allows network to learn to maximize long-term reward with immediate state transition, without direct function mapping
- Enables subject matter expert defined reward and objectives
- Agents learn actions that maximize system reward (present and future) - even in lieu of self interest

SECURITY / OPERATION

Legion security features include role-based login, application authentication and message encryption. Further, the Legion Application Programmer's Interface (API) operates inside a docker container isolating the API from the rest of the system as an extra layer of security, while ensuring the software does not conflict with other required system dependencies.

Arcarithm provides required training on how to interface the Legion network with the database, and how to understand the output, with onsite training available. A training manual is provided with each Legion license, and Arcarithm provides call center support as well.

SYSTEM REQUIREMENTS

CPU	Intel Core i5 or higher
Memory (RAM)	64-bit System: 8GB minimum 32-bit System: 4GB minimum
Operating System	Ubuntu 18.04 or higher
Graphics Card	Nvidia GTX 2080 ti or higher
Minimum Screen Resolution	1280 x 720 pixels
Storage	64GB

Legion is delivered via direct digital download or a set of DVDs.

PRODUCT DETAILS

Manufacturer	Arcarithm
Product Name	Legion™
Version	2021
Manufacturer Part Number	A2021LEG
Product Type	Single License
Platform	Linux
Shipping Method	Digital delivery (or DVDs)

ABOUT ARCARITHM

Deep Learning and Artificial Intelligence (AI) are buzz words commonly used throughout defense and commercial markets, often without true understanding of those terms. At Arcarithm, we are defining those terms and more, with proven solutions on par with multinational tech leaders. From the big picture distinction between strong and weak (or narrow) AI, to the fine-grained focus of deep versus shallow neural networks, Arcarithm delivers a depth of understanding and operational maturity beyond the capability of most companies. Our experience with every aspect of algorithm design, training, deployment and evaluation allows Arcarithm to produce quality products quickly and effectively, with the highest levels of reliability and accessibility.



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