Dynamic Intelligence and Orchestration

Hierarchical Agentic AI framework for scalable mission execution without static workflows

Dynamic Intelligence and Orchestration advances a hierarchical Agentic AI framework that automates the end-to-end orchestration of intelligence tasks dynamically translating analyst intent into action, unlike traditional tools that rely on static workflows or human-in-the-loop execution.

Most competitors rely on traditional workflow automation or single-tier agent architectures, limiting adaptability and scalability. While some companies offer conventional solutions, emerging players are developing capabilities that, while competitive in some areas, are largely complementary to Riverside Research's multi-agent orchestration framework and could serve as valuable partners in a broader integrated solution.

Procedure

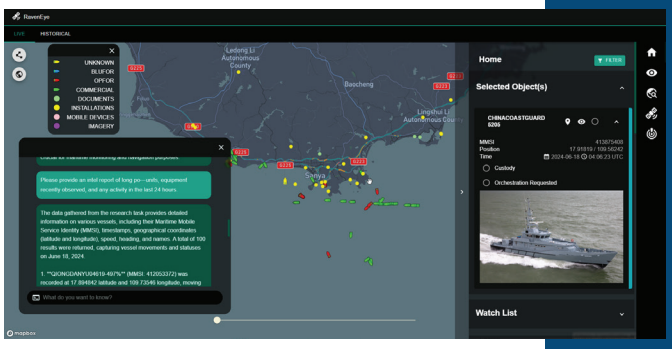
- Conclude the pluggable agentic framework implementation
- Migrate the remainder of our AI Agents to the framework
- Complete BlackSky API/Data integration: ordering collections, historical archived imagery, and visualization support in the UI
- Identify an approach to increase Large Language Models (LLM) determinism and decompose text into workflows

Observations

Agents and tools integration included the AIS database and tools, ATS database and tools (mobile device data support), Janes API, and BlackSky agent and tools, providing increased capability to our application. Having the framework and design pattern in place expedites and simplifies supporting additional agents in the system.

Mobile devices received improved user interaction in live and historical modes to support more data points and smoother animation, and to ensure mobile device meta information was available to the user.

We identified an approach that uses a natural language router which decides each intent and its corresponding action. Additional work was performed in understanding the impact of a local and narrow Retrieval Augmented Generation (RAG) to increase result determinism and agent invocation determinism for input into the LLMs.



The LLM returns a summary of its findings and the UI displays the entities the LLM retrieved. This report contains relevant installations, vessels, and social media posts.

Key Features

- Hierarchical AI agents dynamically invoke sub-agents and tools to construct adaptive, mission-specific workflows tailored to user intent
- Automated orchestration spans the entire intelligence lifecycle—from initial natural language requests to multi-source data fusion, analysis, and actionable output
- Differentiated advantage lies in replacing static, manual workflows with scalable AI-driven intelligence production, enabling rapid responsiveness in dynamic mission environments

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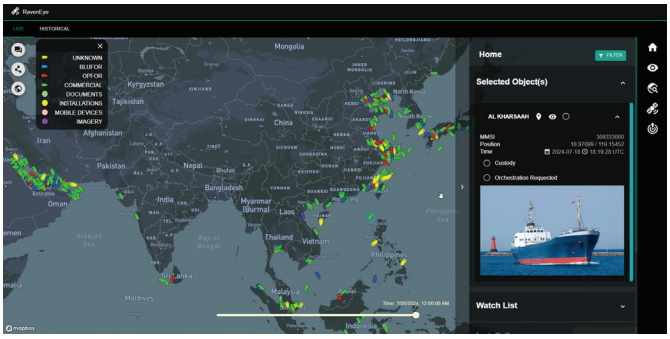
The users requests the LLM for satellite imagery near Long Po Naval Base. The LLM returns the images, which include detections for the user to analyze.



The user can interact with these vessels by clicking on them to see more information in the LIVE tab that displays AIS data.

This IRAD embodies the goal of Project Helix, using Agentic AI for collection, orchestration, and custody. Dynamic Intelligence and Orchestration continues to develop our Agentic AI capabilities for modernized collection, orchestration, and custody, giving us a competitive advantage in the space. It uses natural language to query and provide results, allowing analysts and planners to focus on the problem without need for extensive tool training, while drastically improving operational responsiveness and efficiency to greatly enhance mission success and operational advantage.

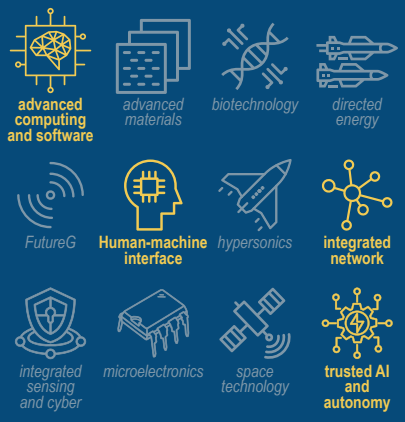
Next Steps

Technical demonstrations will be built to rapidly illustrate the progress, capabilities, and maturity of IRAD investments, emphasizing dynamic intelligence orchestration, and autonomous functionality of hierarchical AI workflows. This will primarily be a prototype hosted in the AWS development environment, enabling users to log in and interact with the automated intelligence tool using live data streams from the integrated APIs—SATELLOGIC, Recorded Future, and ICEYE.

This prototype will demonstrate core functionalities, including data ingestion, querying Essential Elements of Information (EEIs) and Priority Intelligence Requirements (PIRs), and dynamically tasking collection sensors. The prototype will provide a functional proof-of-concept, highlighting the platform's capabilities and identifying areas for further refinement to support future scalability and adoption.

RIVERSIDE RESEARCH

Critical Tech Areas



DoD Priorities

1. Southwest Border Activities
2. Combating Transnational Criminal Organizations in the Western Hemisphere
3. Audit
4. Nuclear Modernization (including NC3)
5. Collaborative Combat Aircraft (CCAs)
6. Virginia-class Submarines
7. Executable Surface Ships
8. Homeland Missile Defense
9. One-Way Attack/Autonomous Systems
10. Counter-small UAS Initiatives
11. Priority Critical Cybersecurity
12. Munitions
13. Core Readiness, including full DRT funding
14. Munitions and Energetics Organic Industrial Bases
15. Executable INDOPACOM MILCON
16. Combatant Command support agency funding for INDOPACOM, NORTHCOM, SPACECOM, STRATCOM, CYBERCOM, and TRANSCOM
17. Medical Private-Sector Care