Artificial Intelligence/ Machine Learning

Riverside Research is a nonprofit organization advancing scientific research for the benefit of the U.S. government and in the public interest. Through our company's Open Innovation Concept, we invest in multi-disciplinary research and development and encourage collaboration to accelerate innovation, advance science, and deliver trusted solutions.

CAPABILITIES

Riverside Research is developing intelligent algorithms capable of processing complex problems to help all military personnel—from analysts and mission planners, to the men and women on the front lines. We focus on bringing the best of AI and human-machine teaming to the warfighter anytime, anywhere. Riverside Research's Artificial Intelligence and Machine Learning (AI/ML) lab provides solutions for all levels of analysis.

BRAIN-LIKE APPROACH FOR TRACKING MARITIME ACTIVITY AND NUANCE (BATMAN)

BATMAN is a Riverside Research framework that verifies detection of ships across multiple data modalities and classifies the spatiotemporal behavior based on the ship type, actions, and surrounding environment. BATMAN uniquely classifies beyond generic anomalies to include multiple ship behaviors to a wide degree, such as offshore/coastal loitering, docked ships, illegal fishing, concealed illegal fishing, and tampering. Intaking data from a variety of sensor streams provides the analyst/mission planner with the location and behavior of all ships in a specific area or on a global scale. The resulting information can then be utilized for relocating assets, such as military vessels, or for planning a mission to handle a BATMAN-identified bad actor.

The BATMAN framework runs in AWS and can be set up for a local runtime, such as NVIDIA DGX. It is optimized for powerful hardware that can handle large volumes of data. Though BATMAN is designed for ship detection and classifying maritime activity, it could be adapted to classify land, air, or space targets. For 2024, BATMAN has been updated to support new classification algorithms and to incorporate synthetic data into its training methods.

GEOCOG

The variability in GEOINT analysis tasks underscores the potential pitfalls of incorporating automation. There's a risk that automation could falter in specific scenarios or inadvertently complicate the tasks for analysts.

As performers on NGA's GEOCOG program, we conduct Cognitive Task Analysis to determine the mental processes necessary for GEOINT workflow tasks. We equip the intelligence analyst to measure behavioral and physiological variables during task execution, which offers insights into cognitive effort required for GEOINT analysis. This approach allows us to quantify of the impact of automation on the analyst's workload. The integration of physiological measurements serves as the primary indicator of cognitive effort during analysis. This method enables a quantitative assessment of the impact brought about by changes to the GEOINT analysis workflow. Cognitive modeling allows for the quantification of an analyst's workload and measures the impact of changes in the workflow process. View our real-time demonstration incorporating physiologic analysis into our analyst dashboard.