Learning Intelligence Norms and Knowledge-management Strategies (LINKS)

Fused COP

AT A GLANCE

WHAT IS IT?

LINKS incorporates the automatic aggregation, fusion, analytics, and distribution policies required to deliver warfighters, at the command center or to mobile forces, timely and actionable information, This information includes mission state assessments, alerting, patterns of life (PoL) recognition, feature/information importance and estimation of tasking performance.

HOW DOES IT WORK?

LINKS applies state-of-the-art techniques to provide dynamic recommendation of mission tasks by recognizing patterns and estimating information importance, making possible for machines to learn from experiences, and adapt to new data. Key techniques leveraged include:

- Reinforcement Learning
- Supervised Learning
- Adaptive Optimization Heuristics

WHAT WILL IT ACCOMPLISH?

LINKS will provide suitability and selectability assessments, information importance and estimates of measures of performance and effectiveness (MOPs/MOEs) to facilitate efficient use of our warfighters' time, supporting multiple evolving tactical missions and information needs.

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ABOUT:

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OBJECTIVE:

- Integrate the fusion of data from disparate sources including Logistics, Fires, Intel and C2 via the Tactical Service Oriented Architecture (TSOA) and the display of this information as a Common Operating Picture (COP) on the Combat Operations Center (COC) and lower echelons
- Evaluate suitability, supportability, and selectability of assets based on task requirements, mission objectives, and estimated information importance in order to provide a decision aid for tactical task recommendations

One of the greatest technical challenges still facing the military community today is the processing of huge amounts of information, determining what is important from it, and how to get it to the right person at the right time. LINKS's design and underlying architecture incorporates the automatic aggregation, fusion, analytics, and distribution policies required to deliver warfighters, at the command center or to mobile forces, timely and actionable information, utilizing machine learning / artificial intelligence (ML/AI) techniques. These approaches will help commanders identify critical indicators, metrics and patterns, and adjust optimization criteria based on predicted MOPs/MOEs to create the autonomy of future decentralized decision support systems.

LINKS primarily leverage ML/AI techniques and optimization heuristics to provide a prediction and recommendations of tactical mission tasks, information importance, and MOPs/MOEs as a function of time and conditions. This approach will be further leveraged so recommended tasks get more effective over time by learning from past plans.

RESEARCH CHALLENGES AND OPPORTUNITIES:

- Provides users with a framework (Fused COP) that facilitates the configuration of dashboards, complementing a geospatial map, to display tailored mission metrics and assessments.

- Determine the importance/criticality of specific information to mission task execution derived from the features to confirm or deny learned patterns and MOPs/MOEs.

- Enhance task management capabilities by providing a prediction of the integrated task plan's performance as a function of time and/or mission tasks, as well as alternatives to increase such performance.

- Provide automated recommendation of alerts/notifications to decision-makers based on the confirmation or anomaly detection of conditions/features on learned POLs, geo and temporal events, and dynamic task recommendations.