

Solicitation:

Co-traveler

Prediction:

Layered Target Reacquisition and Prosecution from Wide Area Motion Imagery (WAMI) Cues

Entity #2

Entity #1

DARPA SBIR Sponsor AF112-163 Topic Number Accurate Entity Alignment at Scale Primary Innovation Co-traveler Prediction Secondary Innovation

Space

Time

Cross-Network Association Prediction & Learning

Under this topic, STR developed advanced machine learning algorithms to associate personas across multiple virtual networks and correlate physical activity with virtual activity.

Our Cross-Network Association, Prediction, and Learning (CNAPL) algorithms achieved **0.72** Average F1 accuracy score on a large publicly available dataset, *exploiting only graph network features*. Subsequently, STR adapted the algorithms to serve as a recommender engine to suggest most likely candidates to align with a single *activity profile* posed in a query. The software was later transitioned to a major Joint Capability Technology Demonstration (JCTD) program and applied to the problem of learning activity patterns to predict *co-traveler associations*.

IMPACT TO THE MISSION

A fundamental challenge faced by DoD and Intelligence Community analysts is tracking activity profiles across disparate virtual and physical domains. CNAPL's machine learning models and recommendation engine offer an accurate, scalable solution to this fundamental disambiguation challenge, in turn providing a reliable foundation for subsequent analysis. Commercial benefits include fraud detection and improved prediction of market trends to inform product development.

BEYOND PHASE II

CNAPL co-traveler results were briefed to the JCTD customer. The analysis has informed plans for future work in this area. STR was recently awarded a Phase III followon effort on a closely related SBIR topic. STR has developed unsupervised entity alignment algorithms under DARPA's Modeling Adversarial Activity program.

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