Qualifications and Capabilities

Strong, highly qualified research group with expertise in a number of relevant areas

Algorithms and Analytics
- Real-time, open source data mining for statistical modeling and analysis
- Data-driven behavior models at the individual and population level
- Terrorism modeling and prediction
- Anomaly detection
- Natural Language Processing
- Clustering and Classification
- Streaming graph analytics
- Heterogeneous, multi-modal data fusion
- 'Big Data' visualization
- Processing open/closed data sources including news aggregators, blogs, forums, social media services, email, text communications, (un)employment indices, population income measures, consumer confidence indices, stock/financial market indices, crime rate data, etc.

SIGINT Subject Matter Expertise
- Technical SIGINT and applied research with previous assignments at the National Security Agency (NSA), Central Intelligence Agency (CIA), US Air Force Intelligence, Surveillance, and Reconnaissance (ISR) Agency, and National Air and Space Intelligence Center (NASIC)
- First-hand experience in all phases of the ISR process of Planning and Direction, Collection, Processing and Exploitation, Analysis and Production, and Dissemination (PCPAD) with a wide array of both national and conventional systems
- Expertise in the treatment & handling of encrypted data from the sensor to the analyst

High Performance Computing
- Application of supercomputing to SIGINT
- Software optimization
- Software tools for productivity and performance
- Middleware, libraries, and APIs for high speed applications
- System architecture design

Research Areas of Interest

- Application of sociological theories relevant to radicalization, violent extremism, and terrorism for the mining, classification, and analysis of streaming SIGINT data [1,2]
- Application of HPC to high-volume, data-driven prediction models [3]
- The continuous incorporation of human knowledge into signal processing for validated knowledge formation [4]

- Previous research in these areas funded by ONR, DARPA, AFRL, ASD (R&E)
- Interested and able to work at all levels of classification

1. Briscoe, E., Weiss, L., Whitaker, E., & Trewhitt, E. (2011). A Systems-level Understanding of Insurgent Involvement in IED Activities. *Systems Research and Behavioral Science, 28(4)*.
2. Weiss, L., Briscoe, E. Hayes, H., Kemenova, O., Harbert, S., Li, L., Lebanon, G., Stewart, C., Miller, D. Foy, D. (2013). A Comparative Study of Social Media and Traditional Polling in the Egyptian Uprising of 2011. *Proceedings of the 2013 International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction*.
3. Ediger, D., Appling, S., Briscoe, E., McColl, R., & Poovey, J. (2014). Real-Time Streaming Intelligence: Integrating Graph and NLP Analytics. *Proceedings of the 2014 IEEE High Performance Extreme Computing Conference*.
4. Appling, D., Briscoe, E., Ediger, D., Poovey, J., & McColl R., (2014). Deriving Disaster-Related Information from Social Media. *KDD Workshop on Learning about Emergencies from Social Information (KDD-LESI-14)*.

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