

SOCOM234-001: Analyzing Narrative Evolution Across Social Networks

ADDITIONAL INFORMATION

N/A

TECHNOLOGY AREAS:

Human Systems | Information Systems

MODERNIZATION PRIORITIES:

Artificial Intelligence/ Machine Learning | Autonomy | General Warfighting Requirements (GWR)

KEYWORDS:

Artificial intelligence (AI); Machine Learning (ML); social network analysis; narrative detection; narrative modeling; narrative evolution; narrative transformation; coordinate activity; cultural convergence; misinformation; disinformation; quantitative; qualitative; target audience; natural language processing; network analysis; social media

OBJECTIVE:

The objective of this topic is to develop applied research toward an innovative capability to automatically detect, track, and differentiate the evolution of narratives over time in the information environment. This study should explore the use of Artificial Intelligence (AI), such as natural language processing, to project long-term narratives among social networks and track changes associated with micro-changes in narratives based on responses, tracked online, to events shared by a social network.

IMPORTANT: For SOCOM instructions: please visit: <https://www.defensesbirsttr.mil/SBIR-STTR/Opportunities/>. Go to the bottom of the page and click "DoD SBIR 23.4 Annual". Once there, go to the SOCOM SBIR 23.4 Release 1

ITAR:

The technology within this topic is restricted under the International Traffic in Arms Regulation (ITAR), 22 CFR Parts 120-130, which controls the export and import of defense-related material and services, including export of sensitive technical data, or the Export Administration Regulation (EAR), 15 CFR Parts 730-774, which controls dual use items. Offerors must disclose any proposed use of foreign nationals (FNs), their country(ies) of origin, the type of visa or work permit possessed, and the statement of work (SOW) tasks intended for accomplishment by the FN(s) in accordance with section 3.5 of the Announcement. Offerors are advised foreign nationals proposed to perform on this topic may be restricted due to the technical data under US Export Control Laws.

DESCRIPTION:

As a part of this feasibility study, the proposers shall address all viable overall system design options with respective specifications for detection and tracking the evolution of narratives across time and social networks. Current research captures proto-narratives at a snapshot in time and can track the engagement of audiences with a particular proto-narrative over a time period. However, narratives are not static; they evolve in the course of engagement by audiences. The main features of technology development should focus on constructing a quantitative model for tracking the evolution of narratives over time, including the transformation of one narrative into another, the dissolution of existing narratives, and the merging and splitting of strategic narratives from / into sub-narratives.

PHASE I:

Conduct a feasibility study to assess what is in the art of the possible that satisfies the requirements specified in the above paragraphs entitled "Objective" and "Description."

The objective of this USSOCOM Phase I SBIR effort is to conduct and document the results of a thorough feasibility study ("Technology Readiness Level 3") to investigate what is in the art of the possible within the given trade space that will satisfy a needed technology. The feasibility study should investigate all options that meet or exceed the minimum performance parameters specified in this write up. It should also address the risks and

potential payoffs of the innovative technology options that are investigated and recommend the option that best achieves the objective of this technology pursuit. The funds obligated on the resulting Phase I SBIR contracts are to be used for the sole purpose of conducting a thorough feasibility study using scientific experiments and laboratory studies as necessary. Operational prototypes will not be developed with USSOCOM SBIR funds during Phase I feasibility studies. Operational prototypes developed with other than SBIR funds that are provided at the end of Phase I feasibility studies will not be considered in deciding what firm(s) will be selected for Phase II.

PHASE II:

Develop, install, and demonstrate a prototype system determined to be the most feasible solution during the Phase I feasibility study on an advanced analytic capability to detect, track, manage, and differentiate the evolution of narratives across social networks in the information environment.

PHASE III DUAL USE APPLICATIONS:

This system has applicability in a broad range of other broader DoD, USG, or private company applications where planners, operators, and assessors must determine the most appropriate target audience for engagement to create effects in the information and cognitive domain, leading to physical behavior change. Advanced narrative detection would allow for better predictive analysis and create flexibility and more rapid responsiveness to changes in the information environment. This responsiveness is paramount for DoD strategic communications, intelligence agencies, and can benefit private companies needing to track shifts in conversation regarding social trends related to their products. Importantly, advanced narrative detection presents opportunity to track, measure, and assess changes over time, and to better assess effectiveness by correlating changes to events in the information environment.

REFERENCES:

1. Bail, C. A. (2016). Combining natural language processing and network analysis to examine how advocacy organizations stimulate conversation on social media. *Proceedings of the National Academy of Sciences*, 113(42), 11823–11828. <http://dx.doi.org/10.1073/pnas.1607151113>; Davis, J. T., Perra, N., Zhang, Q., Moreno, Y., & Vespignani, A. (2020). Phase transitions in information spreading on structured populations. *Nature Physics*, 16(5), 590– 596. <http://dx.doi.org/10.1038/s41567-020-0810-3>; Measuring coordinated vs. spontaneous activity in online social movements. *SocArXiv*. <http://dx.doi.org/10.1177/14614448211041176>

TOPIC POINT OF CONTACT (TPOC):

None