OBJECTIVE: Develop a Cyber Terrain and Electromagnetic Operating Environment (EMOE) Scenario Generation Toolkit (CTAEMOESGT) software that can generate various real world scenarios/use cases/vignettes. This capability will enhance and aid in planning with the use of simulation Cyber Electromagnetic Activities (CEMA) Tactics Techniques Procedures (TTP) within Doctrine, Organization, Training, Material, Leadership and Education, Personnel, and Facilities (DOTMLPF) environment.

DESCRIPTION: Develop a predictive tool that is able to enhance Cyber understanding and increases situational awareness within various types of terrains and Electromagnetic Operating environments. The increased ability shall be flexible enough to acquire various types of data inputs that encompass geolocations, relationship of organizational groups, types of urban and rural infrastructures (such as building structures, roads, and traffic flow of people and vehicles), and electromagnetic spectrum usage. This tool will provide trends and support the tactical and strategic decision making process.

PHASE I: Research and draft a feasibility study in a technical report that includes an approach to develop prototype software with the following considerations: 1) samples of scenarios with tips, hints, checklists, examples; and the specific information needs and justifications within the context of the operational intentions by decision-makers; 2) pre-emptive display of template for creating scenarios based on the selection of the fidelity levels, mission types, and events/scales of operations; 3) accurate identification of persons of interest and their malicious activities via multi-source collection/processing; 4) the mechanisms/features for aiding analysts with automation of template and workflows of intelligence driven scenarios based on requirements of the intelligence needs and mission planning; 5) Common Operational Picture (COP) to exhibit realistic activities and modes of conducts under various urban operational environments within Concepts of Operations (CONOPS); and 6) assessment of the lessons learned via the standard schemas/tools and interface with the selected government models and database together with the user friendly Human Machine Interface (HMI). The events and activities in each scenario should be modeled in generic and extensible modules to support creation of specific details and building of libraries of event/activity portfolio by the users. The models should be realistic and diversified to support pattern and link association for trend analysis. The technical report shall include all findings and technical approaches to develop a software prototype to proceed to Phase II.

PHASE II: Research and develop a prototype software and a technical report that capture and allow operators to simulate realistic and diversified scenarios in an urban environment. The prototype shall be able to predict the capabilities, intentions, and potential actions of persons of interest based on lessons learned and support a Course of Action (COA). The software will generate CEMA information for analysis in a usable format to support automated reasoning and a rationale to the user in order to support a decision. The technical report needs to identify the development findings and outcomes, along with the strengths and limitations for each software model, database, algorithm, and technique that was explored and used. In addition there should be a plan to enhance and transition the capabilities of the technology to a U.S. Army Program of Record.

PHASE III DUAL-USE APPLICATIONS: The software developed in this effort may be leveraged in a broad range of potentially high payoffs for military and civilian applications. The predictive analysis capability will assist the military with decision aids to support U.S. Army Program of Record regarding force protection, mission command, surveillance, maneuverability, and training. The commercial potential could be used in modeling building infrastructures, determining the placement of communication systems, transportation, and industrial security. Overall the modeling and simulation tool would be an asset for short- and long-term planning to recognize and deter threats.

REFERENCES:
1. publicintelligence.net/us-army-cema
2. apps.dtic.mil/dtic/tr/fulltext/u2/a562410.pdf

KEYWORDS: Cyber Terrain, Electromagnetic Operating Environment (EMOE), Cyber Electromagnetic Activities (CEMA)