

## **FY2014 MINERVA RESEARCH INITIATIVE TOPIC #4**

### **Emerging Topics in Conflict and Security**

Just as the Cold War gave rise to new ideas and fields of study such as game theory and Kremlinology, the challenges facing the world today call for a broader conception and application of national power that goes beyond military capability. Accordingly, the Department of Defense is interested in new approaches and methods to identify issues that have been overlooked yet may define the future security environment.

#### **Subtopic 4-A: Quantification and metrics**

*(address only in conjunction with one or more additional Minerva topics)*

While qualitative research provides distinct and important insights for many defense issues, there are cases where quantitative models offer particular advantages. In particular, quantitative models offer more consistent and reproducible data manipulation, well-defined comparisons between sets of data, and the potential for trend assessment and forecasting.

To leverage these analysis opportunities, many researchers use quantitative models and numerical representations to denote more subjective observations. Such quantification and metrics may be well suited for an immense variety of physical phenomena, but there is little understanding of to what extent they can be applicable for social phenomena. In addition, different quantification and metrics for given sociological phenomena can lead to radically different computational models and results, and by extension lead to radically different social and cultural insights intended to inform defense policy and operational decisions.

In the interest of addressing these issues and strengthening models built to inform security issues, the Department of Defense seeks fundamental interdisciplinary research in the context of defense-critical problems to inform and create quantification (how one chooses numbers or vectors or points on manifolds to represent social phenomena) and metrics (how “close” two social phenomena are to each other) that are based on sociological and socio-cognitive principles.

Additional themes of interest include:

- Data validation and universal standards for accounting for sampling bias in data collected in order to better assess efficacy of the government’s efforts.
- Scaling spatial econometric, time series, and multi-level model analysis to encompass  $n$ -dimensional variables approximating a societal unit of analysis.
- Novel methods to better infer causal connections from unstructured qualitative data (e.g., patrol reports) rich in detail for a specific context. Insights into relevant causal mechanisms may be available from academic disciplines that are often overlooked, such as business (relationship contracts, supply chain management), microeconomics (competition, cooperation, networks), and evolutionary biology, as well as political science, psychology, sociology, and anthropology.

### **Subtopic 4-B: Additional topics**

The Department of Defense Minerva program welcomes additional research proposals addressing other areas of international affairs, international security, and national security that are newly emerging or have not been properly understood.

#### **Research Topic Chiefs:**

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