

Section Three: Forecasting

Forecasting the sociocultural environment and behaviors

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Capabilities are needed for tracking and forecasting change in entities and phenomena of interest along multiple dimensions (time, space, social networks, types of behavior, etc.) through persistent sensing and modeling of the environment. (Schmorrow, 2011, p. 43)

Flynn, Sisco and Ellis (2012) wrote “With a deeper understanding about populations, <we> will be able ... to more accurately analyze how contemporary threats will likely impact populations and identify means for counteracting them when they are potentially harmful. But the process begins with a robust ... capability before threats manifest themselves.” This encapsulates a major challenge of HSCB forecasting. The chapters in this section describe the state-of-the-art capabilities available to meet some of these challenges, as well as emerging capabilities that are likely to be useful in the near future.

Data Processing

The chapter on data processing addresses issues related to representing a particular sociocultural system in a way that involves only data about an actual, ongoing situation that can be used to (1) reveal meaningful changes in the system over time and (2) inform models that can help users to anticipate those changes. These characteristics distinguish data processing issues for forecasting from those in the Understand capability area, in that both current and historical data can aid in forecasting sociocultural behavior. They also separate forecasting from the Detect capability, where it suffices for algorithms to find patterns in data without predicting future behavior. The chapter centers on selected aspects of data processing relevant to dynamics-based models and illustrates the discussion with applications relevant to the dynamics of political and insurgent networks.

Computational Modeling

The computational modeling chapter emphasizes that the nature and basis of models used across the various social science disciplines differ, and also differ from those of the physical models that underlie traditional military simulation. Computational sociocultural models require the ability to represent and manipulate imprecise perceptual and cognitive concepts. This chapter describes how computational sociocultural models can contribute to forecasting human behavior and sociocultural interactions, and account for natural vagueness of human thought and communication, along with the dynamics, complexity, uncertainty, variability and unpredictability of actions and behavior. It discusses 11 different types of computational sociocultural models chosen to cover a broad set of approaches, but those types by no means exhaust the options available. (Note that all the other chapters in this section also discuss dynamic models in their respective contexts.)

Visualization

The chapter on visualization examines forecasting, analysis, and visualization using the ‘social radar’ metaphor and standard questions of interest to analysts of complex systems. The author illustrates the concept by the example of the Virtual Strategic and Forecasting Tool (V-SAFT) developed by Lustick Consulting, which represents a stand-alone offshoot of work performed by the Worldwide Integrated Crisis Early Warning System team at Lockheed Martin Advanced Technology Laboratories. The discussion uses the state space of the future produced by V-SAFT as a target for queries designed to distinguish plausible and probable futures from those that are merely possible. It also covers how the tool can monitor change across regularly updated versions of that state space in order to generate indications and warnings, and can offer opportunities for what-if experiments to clarify the implications of different assessments of key variables in the real world.

Training

The training chapter describes the current state of the science and technology related to training in sociocultural forecasting, and identifies gaps that research must address to develop capabilities for application in operational settings. The chapter begins with an overview of forecasting in the sociocultural domain, with an emphasis on forecasting change in cultural behavior and social structure. It explores the relationship between sociocultural sensemaking and forecasting and presents a use case to illustrate the problem. The chapter then surveys the literature on training for forecasting, with an emphasis on probabilistic forecasting, and highlights special problems associated with forecasting in the sociocultural domain, along with their training implications. These include the nature and range of problems being predicted, from short-term political actions and events to long-term change in a population’s cultural values, beliefs, and behaviors.

References

- Flynn, M. T., Sisco, J., & Ellis, D. C. (2012) Left of bang: The value of sociocultural analysis in today's environment. *PRISM*, 3(4), 12-21.
- Schmorrow, D. (2011). *Sociocultural behavior research and engineering in the Department of Defense context*. Washington, DC: Office of the Secretary of Defense, Assistant Secretary of Defense for Research and Engineering, Human Performance, Training, and BioSystems Directorate.