

## Simulation Experiments and Efficient Designs for Agent-Based and Systems Dynamics Models Pertaining to Problems of National Defense

As statisticians, the bread and butter of our work is to collect and analyze data, but often we find ourselves under circumstances in which data is not abundant, nor practical to collect, yet statistical insight is needed for decision making. Simulation experiments provide a useful tool for such cases. In particular, the U.S. Department of Defense relies on simulation models to assist in its decision making for developing war plans, deciding what equipment to acquire, and how to organize and employ forces. Most of these simulations are extremely large and have many uncertain input variables. In this talk, I will cover some methods of dealing with such large designs, and present two defense related simulation experiments, the first using a systems dynamics model, and the other an agent-based design.