

Social Ecological Gaming and Simulation Technologies Support Livestock Emergency Preparedness

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SECURE FOOD SUPPLY
New England



SEGS Lab
social ecological gaming and simulation



SCAN ME

INTRODUCTION

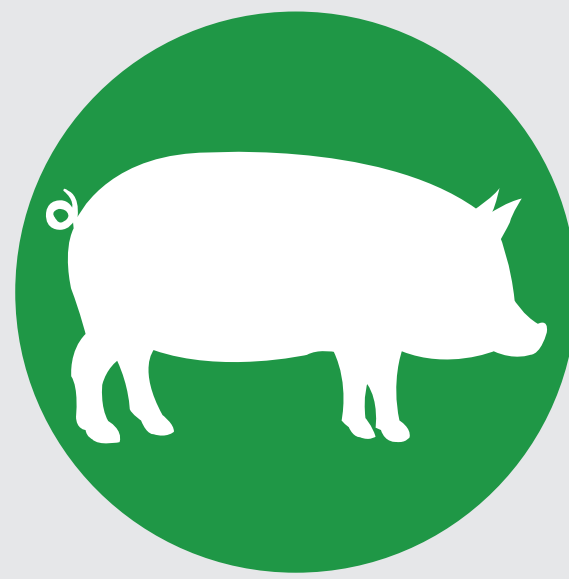
The Social-Ecological Gaming and Simulation (SEGS) Laboratory is a transdisciplinary research lab focused on modeling social-ecological systems. Complex systems approaches are used to understand how the ecosystem of interest responds to human activities and how these are influenced, for instance, by economics, politics, and culture. The SEGS Lab utilizes a suite of technologies and data science in its work, including digital experiments (aka serious games), analysis of big data, and agent-based models. These approaches have been applied to problems such as biosecurity, food security, and climate change.

METHODS

Examples of gaming and simulation technologies:



Simulation Games



Agent-based Models



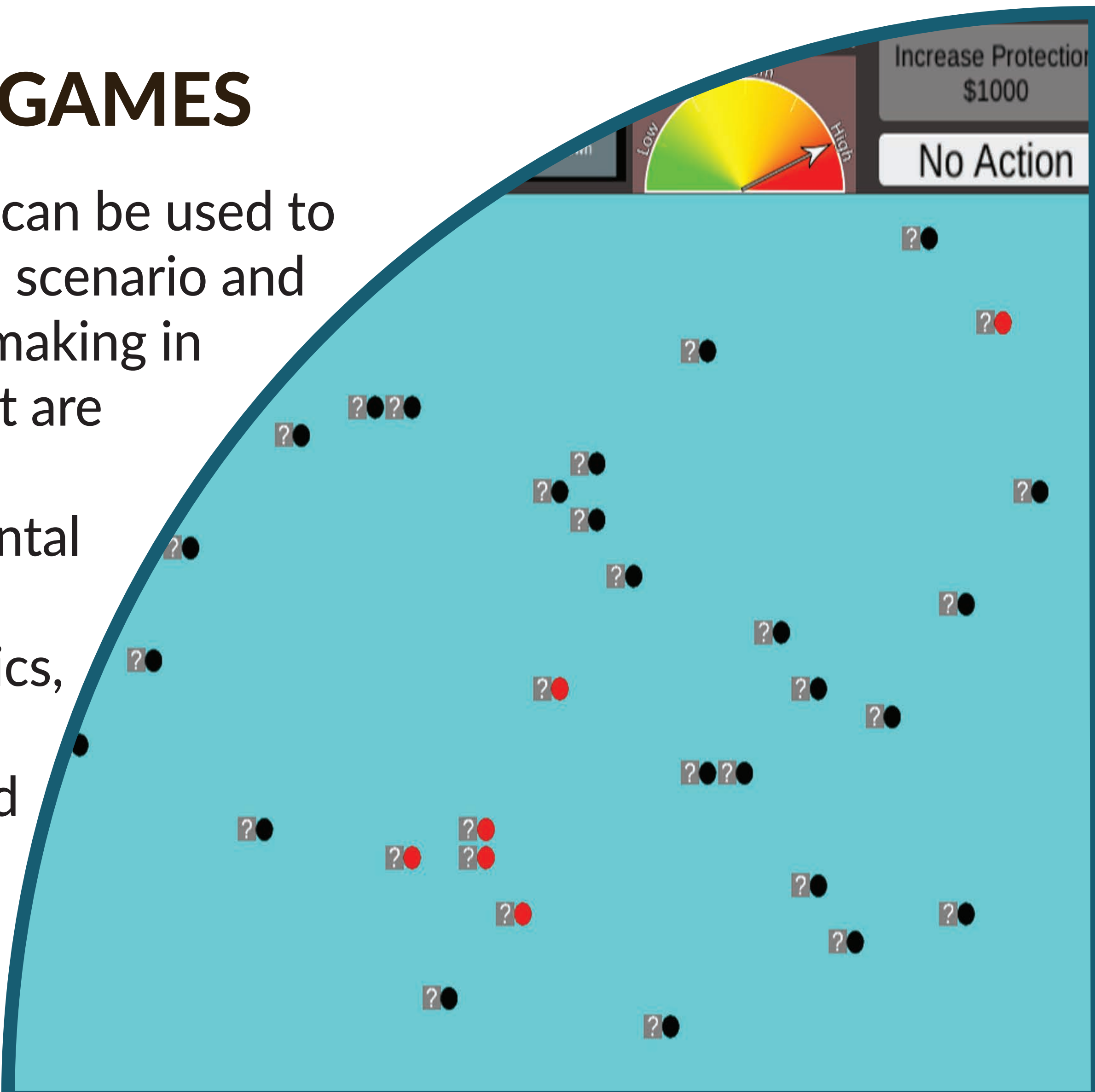
Big Data & Data Science



Software Apps

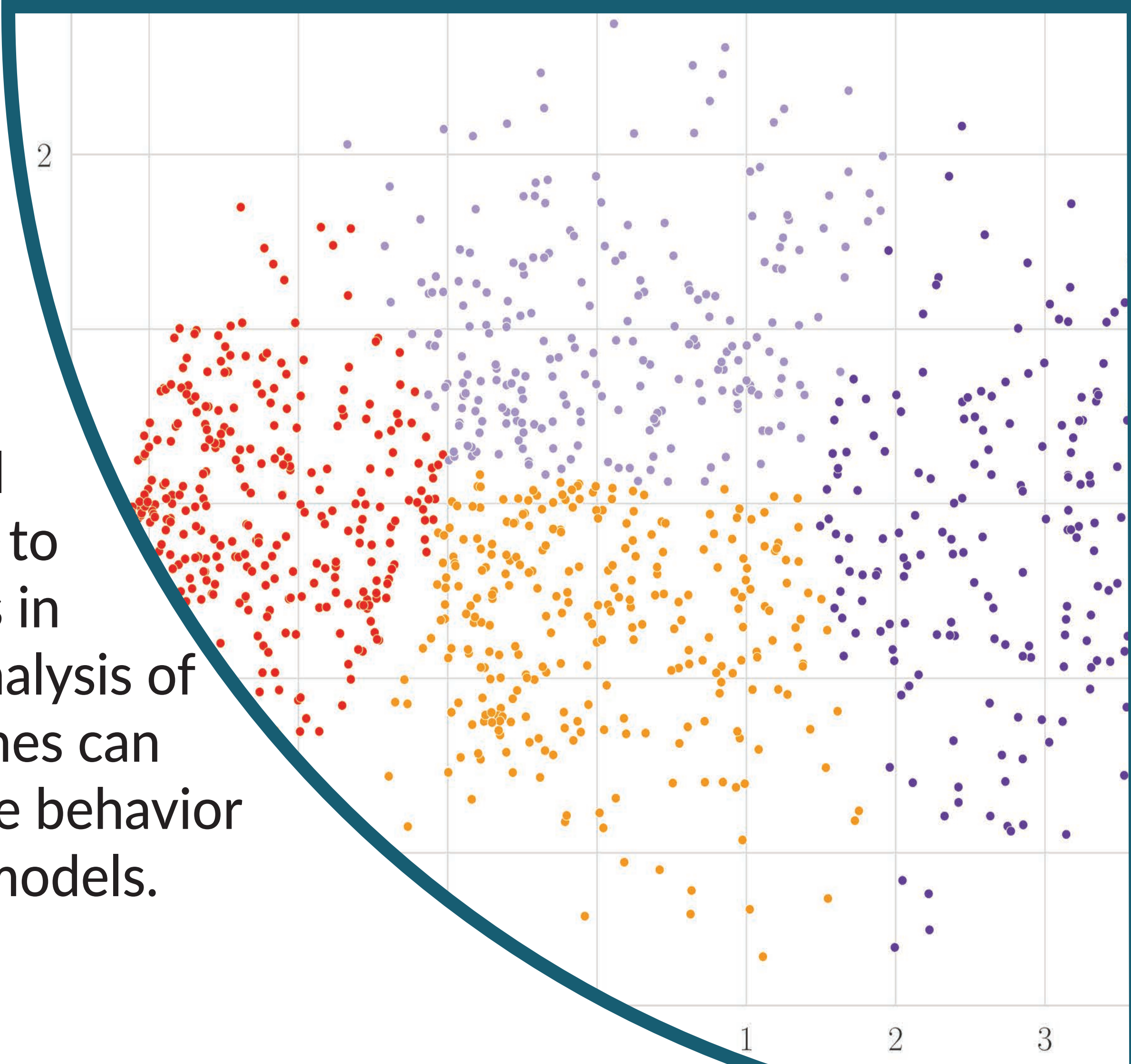
SIMULATION GAMES

Experimental games can be used to immerse a *player* in a scenario and track their decision-making in response to cues that are associated with an underlying experimental treatment matrix. Communication tactics, incentives, and policies can be tested in this format.



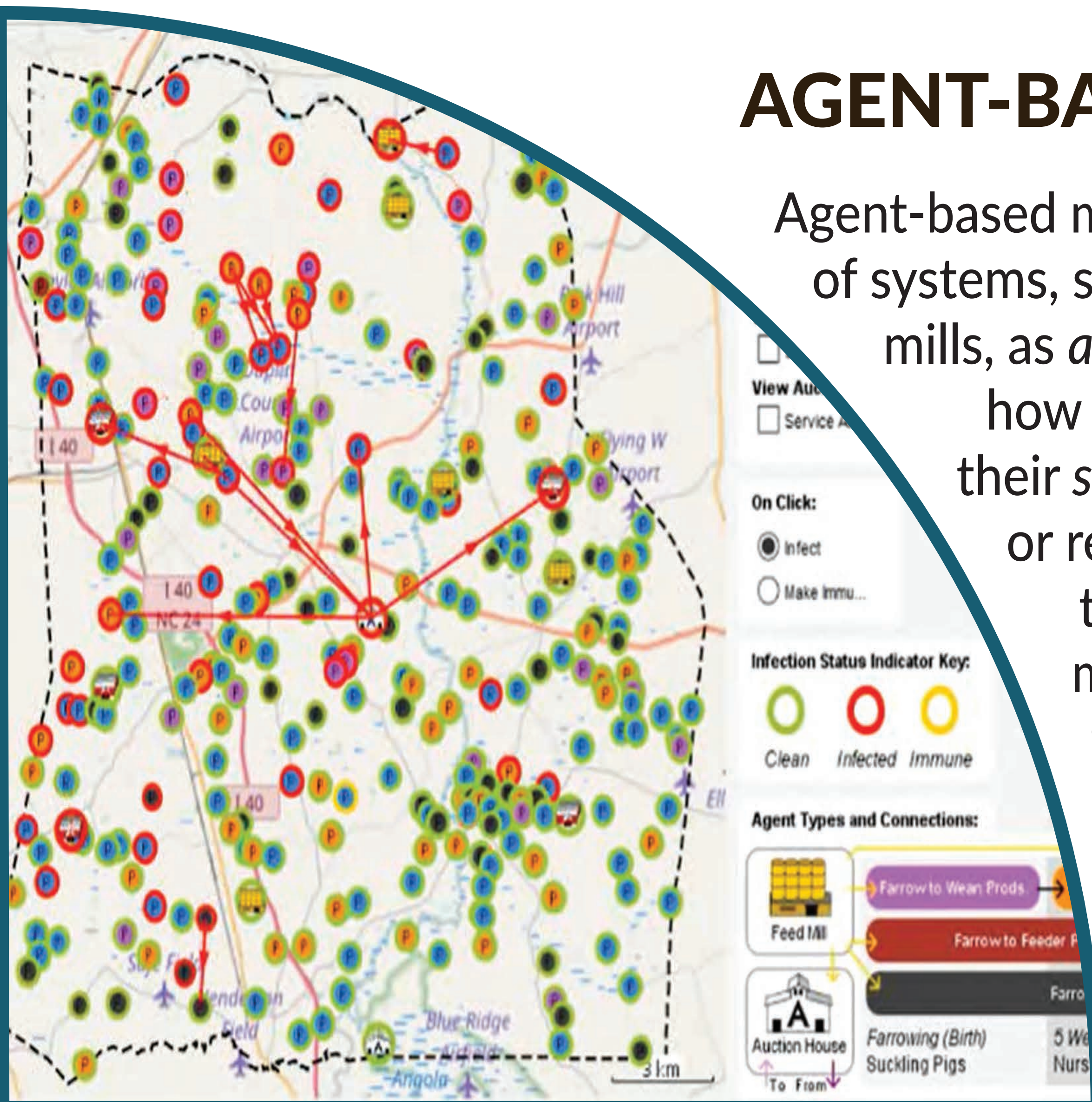
BIG DATA & DATA SCIENCE

Data science tools such as machine learning and artificial intelligence are used to analyze relationships in complex systems. Analysis of data from digital games can be used to inform the behavior of human agents in models.



AGENT-BASED MODELS

Agent-based models represent parts of systems, such as farms and feed mills, as *agents* with rules about how they interact and how their *states*, such as infected or recovered, change with time. Human decision-making was added into these models because decisions by people are responsible for how diseases spread.



SOFTWARE APPS

Visualization of hazards and disease transmission pathways along with mitigation tactics are important to protect livestock facilities from geophysical and biological emergencies. The SEGS Lab recently programmed an app to facilitate the development of enhanced biosecurity maps for food animal industries.

