

Good Reads About Systems

Recommendations from SERC leadership, researchers and community

[“Effects of Differential Risk Attitudes in Collaborative Systems Design”](#)

In this paper for INCOSE’s *Systems Engineering* journal, SERC’s [Paul Grogan](#) and co-author Alkim Avşar investigate how risk attitudes affect design and strategy decisions in collaborative systems through the lens of game theory. First, an analytical model studies the effect of differential risk attitudes in a two-actor problem with stag-hunting strategic dynamics formulated as single- and bi-level games. Next, a simulation model pairs actors with different risk attitudes in a 29-game tournament based on a prior behavioral experiment. Results show that outcomes in collaborative design problems change based on the risk attitudes of both actors. Results also emphasize that considering conservative lower-level design options facilitates collaboration by providing risk-averse actors with a safer solution. By accepting that decision-making actors are not all risk-neutral, future work seeks to develop new design methods to strengthen the adoption of efficient collaborative solutions.

[“Effects of Individual Strategies for Resource Access on Collaboratively Maintained Irrigation Infrastructure”](#)

Built infrastructure for water and energy supply, transportation, and other such services underpins human well-being and socioeconomic development. A fundamental understanding of how infrastructure design and user strategies interact can guide important design decisions as well as policy formulation for ensuring long-term infrastructure viability in conjunction with improved individual user benefits. In a paper for *Systems Engineering*, authors Jordan Stern, Afreen Siddiqi, and Paul Grogan developed an agent-based model (ABM) to study this issue for the specific case of irrigation canals. An ABM is used to investigate how an option to use an independent water source interacts with canal design to affect canal maintenance cooperation and farmer income.

General Good Reads

[“The Defense Department is Finally Getting Workforce Development Right”](#)

Karen Thornton, a former attorney for the House Armed Services Committee and [current Fellow of the Acquisition Innovation Research Center](#) (AIRC), wrote in *Defense News* about the new [Defense Civilian Training Corps](#), “which will offer DoD internships and an experiential learning-based curriculum on college campuses, to engage students in real-life national security problem-solving while adhering to the values of public service and integrity.”

[Vectors: Heroes, Villains, and Heartbreak on the Bridge of the U.S. Navy](#)

As Acting Secretary of the Navy, Thomas Modly held fast to the mantra of “acting, not pretending,” and thus advocated aggressively for the Navy and Marine Corps’ future — a future he believed would be defined by uncertainty and unpredictability. Every Friday he wrote a personal message to the entire Department regardless of rank. Those messages were called SECNAV Vectors. Each Vector was intended to clearly communicate his priorities and to establish a rapport with all levels of the

organization. The subject of each Vector was inspired by real events that occurred in real time. As these events unfolded, the Secretary's unyielding emphasis on being prepared for unpredictable events are proven to be prescient as the Navy found itself, unintentionally, in the center of COVID-19 crisis.

[Nonsimplicity: The Warrior's Way](#)

Predicting the future is a fool's errand, particularly about the activities and structure of an organization as complex as the United States Army. However, it is possible to predict what will likely happen to such a behemoth if the lessons of past organizational failures are not acted on to make changes in existing policies and procedures. But seeing what needs to be done and convincing those in power to begin the process of change are two very different things. This book by Bruce West and Chris Arney addresses what complexity science suggests are the appropriate changes in policies, procedures, and principles needed, specifically what the implications are for the individual within the military, when these changes are made.