REPPERGER RESEARCH INTERN PROGRAM

RESEARCH PROJECT #: AFRL-RHW-26-03

Structured Analyses of Cognition, Information, and Influence

PROJECT DESCRIPTION: Understanding patterns of information spread and influence in large populations requires examining complex interplays between factors at the individual level, such as human cognitive abilities, and those at the group level, such as cultural beliefs and network composition. While this problem space is large and difficult to quantify, the use of structured analytical techniques, such as agent-based models and cognitive task analyses, have shown great success. This project leverages a broad range of theories from sociology, psychology, complexity studies, and network science to understand how interplays between individuals and their environments result in complex phenomena such as mis-/dis-information effects, social mobilization, and large-scale influence campaigns. The project supports the Air Force's strategic goals of understanding the impact of Operations in the Information Environments (OIE). Specifically, the products engaged with during this internship will provide theory-driven analytic frameworks for testing hypotheses related to the effects of Information Operations (IO) using extant scientific literature and publicly available information (PAI). Ultimately, the frameworks developed during this project will support IO analytics and characterization efforts, provide computational frameworks for future wargames, and generate novel insights into the study of information and influence within the DoD.

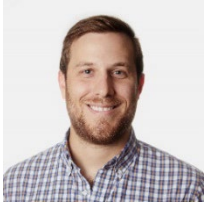
LEARNING OBJECTIVES: This project will provide students with the opportunity to develop structured frameworks (e.g., computational models, complex system analyses) based on theoretical insights garnered from a diverse set of disciplines. Students will learn about the theoretical processes that underlie effects in the information environment and use rigorous analytical techniques and modeling principles to translate these processes into formalized, testable frameworks. Through this experience, students will improve their abilities to develop formal, systematic methods for multimodal problem sets and gain an understanding of social and cognitive issues related to Information Operations.

ACADEMIC LEVEL: Masters; Doctoral

DISCIPLINES NEEDED: Sociology; Cognitive Science; Experimental Psychology

RESEARCH LOCATION: Wright-Patterson Air Force Base, Dayton, Ohio

RESEARCH MENTOR: Taylor Curley, Ph.D.
Experimental Psychology, Georgia Institute of Technology, 2021



Dr. Taylor Curley is a Research Psychologist in the Cognition and Modeling Branch within the Human Effectiveness Directorate of the 711th Human Performance Wing, Air Force Research Laboratory, Wright-Patterson AFB, Ohio. He serves as an expert on computational modeling of human behavior and cognition, particularly as it relates to performance. Dr. Curley has used symbolic cognitive architectures and neurocognitive models to simulate memory, sustained attention, fatigue, and vision. He also serves as an expert in agent-based modeling, complex systems analysis, and advanced statistical methodologies. Dr. Curley's previous experience includes work in cognitive aging, memory decline, and longitudinal analysis of cognition. He served as a contractor with Cubic Defense prior to joining the AFRL as a civilian.

Photo Courtesy of Air Force Research Laboratory

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RESEARCH MENTOR: Kirsten Rice
B.S. in Psychology, Wright State University, 2019

Ms. Kirsten Rice is a Research Psychologist in the Cognition and Modeling Branch within the Human Effectiveness Directorate of the 711th Human Performance Wing, Air Force Research Laboratory, Wright-Patterson AFB, Ohio. She serves as an expert in human factors psychology and cognitive warfare, particularly as it relates to operator performance. Ms. Rice has experience evaluating complex socio-technical systems, conducting Cognitive Tasks Analysis and developing user requirements definitions and use cases to support the tasks, decisions and needs of the operational community. Previous experience includes working with numerous end-user communities including mission planners, information operations analysts, intelligence analysts and cyber analysts. She anticipates earning a M.S in Human Factors Psychology from Embry-Riddle Aeronautical University in 2026.