

**NORTH CAROLINA STATE UNIVERSITY**

**OPERATIONS RESEARCH PROGRAM  
SEMINAR SERIES**

**February 26th, 2024  
4:30PM-5:45PM**

**In-Person: 4290 Fitts-Woolard Hall**

**[Zoom](#) details – bottom of page**

**COL Nicholas J. Clark, PhD**

**COL, USA Associate Professor  
Department of Mathematical Sciences at  
United States Military Academy  
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**Title**

**Advancements in Spatially Correlated  
Self-Exciting Spatio-Temporal Models**

**Abstract**

In criminology, the pervasive theory of repeat victimization posits that locations previously affected by crime or violence are more susceptible to future incidents. Statistical modeling tackles this phenomenon through the application of Hawkes processes or self-exciting spatio-temporal models. However, this talk will shed light on the limitations inherent in standard self-exciting models, emphasizing that improperly structured spatio-temporal frameworks can yield inaccurate insights into the root causes of criminal activities or the spread of violence.

In this presentation we will propose a novel approach—spatially correlated self-exciting models—designed to better capture the intricacies of spatial and temporal correlation in crime data. Unlike conventional self-exciting models, this broader class of models offers a more nuanced understanding of the spread of crime or violence. Additionally, we will address challenges related to model identifiability and explore ongoing research utilizing convolutional neural networks as a powerful tool for model selection in the realm of spatio-temporal modeling.

## Biography



### COL Nicholas J. Clark, PhD

COL Nicholas Clark is an Associate Professor in the Department of Mathematical Sciences at West Point. Nick received a BS in Mathematics from West Point in 2002, a MS in Statistics from George Mason in 2010, and a PhD in Statistics from Iowa State University in 2018. His dissertation was on Self-Exciting Spatio-Temporal Statistical Models and he has published in a variety of disciplines including spatio-temporal statistics, best practices in statistical methodologies, epidemiology, and sports statistics. Nick is the former director of the Center for Data Analysis and Statistics, where he conducted research for a variety of Department of Defense clients. COL Clark also was instrumental in standing up one of the first undergraduate degrees in the country in Applied Statistics and Data Science (ASDS) and currently serves as the Program Director for West Point's ASDS program.

### Join via Zoom Meeting

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