



**Calhoun: The NPS Institutional Archive**  
**DSpace Repository**

---

Faculty and Researchers

Faculty and Researchers' Publications

---

2021

# Minitrack Introduction: Decision Analytics, Machine Learning, and Field Experimentation for Defense and Emergency Response

Bordetsky, Alex; Mullins, Steven J.; Hudgens, Bryan J.

HICSS

---

Bordetsky, Alex, Steve Mullins, and Bryan Hudgens. "Minitrack Introduction: Decision Analytics, Machine Learning, and Field Experimentation for Defense and Emergency Response." HICSS, 2021.

<http://hdl.handle.net/10945/68421>

---

This publication is a work of the U.S. Government as defined in Title 17, United States Code, Section 101. Copyright protection is not available for this work in the United States.

*Downloaded from NPS Archive: Calhoun*



Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

**Dudley Knox Library / Naval Postgraduate School**  
**411 Dyer Road / 1 University Circle**  
**Monterey, California USA 93943**

<http://www.nps.edu/library>

## **Minitrack Introduction: Decision Analytics, Machine Learning, and Field Experimentation for Defense and Emergency Response**

Alex Bordetsky  
Naval Postgraduate School  
abordets@nps.edu

Steven J. Mullins  
Naval Postgraduate School  
sjmullin@nps.edu

Bryan J. Hudgens  
Naval Postgraduate School  
bjhudgen@nps.edu

### **1. Minitrack topic**

Defense and emergency first responders must make rapid, consequential decisions and machine learning can aid analytics to support these decisions. Machine learning offers enormous promise, yet well-publicized struggles reveal the need for better datasets and for opportunities to learn in challenging settings. Field experimentation offers the potential to meet these needs through iterative interactions in complex scenarios. Field experimentation can provide live action to facilitate high fidelity datasets that can support machine learning and artificial/augmented intelligence applications. These experiments may incorporate participants from academia; government agencies; militaries; first responders at all levels; and global industry partners. This minitrack explores the interplay between machine learning, field experimentation, and optimization analytics, whether exploratory, theoretical, experimental, in such critical areas as Defense and Emergency Response.

### **2. Salient research issues in this space**

- Requirements for design and implementation of machine learning in complex, collaborative network environments
- AI/ML models for networking, network operations, and networked decision support
- Decision Analytics and ML for organizational knowledge management

- AI/ML model transparency and evaluation in collaborative networks
- AI/ML for command and control
- Field experimentation for IoT applications
- Case studies illuminating any of the topics above

### **3. Papers in this minitrack**

In the first paper, Little, Roberts, and Wallace explore how a pandemic's impacts on first responders and other critical personnel, as well as infrastructure and recovery supply chains, can affect a community's time to recover from a separate disaster. Their study suggests the impacts would be significant and would extend time to recover. The authors argue that such "compound extreme events" require additional attention to overcome our inadequate knowledge about how best to manage degraded capacity for critical personnel, infrastructures, and supply chains.

In the second paper, Shigley, Morton, and Tanner explore how efficiently organizations process incoming information, a topic of great importance to emergency response efforts. The authors assess the degree to which a power law distribution describes the amount of effort an organization invests in processing both important and inconsequential inputs. They hypothesize that increased focus on important inputs helps to defend organizational boundaries against external drivers.