

Jeongkeun Shin

📍 Pittsburgh, PA ✉ jeongkes@andrew.cmu.edu 🔗 jeongkeunshin.github.io

Education

Carnegie Mellon University, School of Computer Science Doctor of Philosophy (Ph.D.) in Societal Computing ◦ Advisor: Professor Kathleen M. Carley ◦ Dissertation: Human-Centric Cyber Warfare Simulation	Pittsburgh, PA May 2027 (Expected)
Carnegie Mellon University, School of Computer Science Master of Science (M.S.) in Societal Computing ◦ Advisor: Professor Kathleen M. Carley	Pittsburgh, PA May 2025
Carnegie Mellon University, College of Engineering Master of Science (M.S.) in Electrical and Computer Engineering ◦ Advisor: Professor Marios Savvides	Pittsburgh, PA May 2021
University of Michigan, College of Engineering Bachelor of Science in Engineering (B.S.E.) in Computer Science	Ann Arbor, MI Dec 2019

Awards & Recognitions

2026 Link Foundation Modeling, Simulation, and Training Fellowship **Honorable Mention**
2024 Annual Modeling and Simulation Conference (ANNSIM) **Best Paper Runner Up**

Publications - Journal

[J.3] **Cyber Attack Flow Intelligence Network: Backbone Analysis and Defense Strategy Optimization**

[Jeongkeun Shin](#), L. Richard Carley, Kathleen M. Carley
IEEE Transactions on Network Science and Engineering

[J.2] **Simulating Trust Dynamics Model for Human-IDS Interaction under DoS Alerts**

[Jeongkeun Shin](#), L. Richard Carley, Kathleen M. Carley
Under Review

[J.1] **Simulating Cyber Defense: The Impact of Phishing Training and System Updates on Mitigating Damage from Hybrid Phishing and Watering Hole Attacks**

[Jeongkeun Shin](#), Siyuan Zhai, L. Richard Carley, Kathleen M. Carley
The Journal of Defense Modeling and Simulation

Publications - Conference Proceedings

[C.13] **Simulation-Based Evaluation of IDS Monitoring Strategies for Denial-of-Service Defense Using Attack Flow Analysis**

[Jeongkeun Shin](#), L. Richard Carley, Kathleen M. Carley
Under Review

[C.12] **Evaluating Intrusion Detection Systems in Attack Flow Contexts**

[Jeongkeun Shin](#), L. Richard Carley, Kathleen M. Carley
Under Review

[C.11] **The Illusion of Optimal Defense: Static Interdiction under Adaptive and Persistent Attackers**

[Jeongkeun Shin](#), Siyuan Zhai, L. Richard Carley, Kathleen M. Carley
Association for the Advancement of Artificial Intelligence (AAAI) 2026 Summer Symposium - *Forthcoming*

[C.10] **Towards Real-time Cyber Warfare Simulation: A High-efficiency Heuristic for Budget-constrained Attack Interdiction**

[Jeongkeun Shin](#), L. Richard Carley, Kathleen M. Carley
Annual Modeling and Simulation Conference (ANNSIM) 2026 - *Forthcoming*

- [C.9] **Network Analysis of Attack Flows in Ransomware Groups and Campaigns**
Jeongkeun Shin, Siyuan Zhai, L. Richard Carley, Kathleen M. Carley
 International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS) 2025
- [C.8] **A Baseline Simulation of Hybrid Misinformation and Spearphishing Campaigns in Organizational Networks**
Jeongkeun Shin, Han Wang, L. Richard Carley, Kathleen M. Carley
 Winter Simulation Conference (WSC) 2025
- [C.7] **Simulation of Human Organizations with Computational Human Factors Against Phishing Campaigns**
Jeongkeun Shin, L. Richard Carley, Kathleen M. Carley
 International Conference on Cyber Warfare and Security (ICWS) 2025
- [C.6] **Design, Modeling and Simulation of Cybercriminal Personality-based Cyberattack Campaigns**
Jeongkeun Shin, Geoffrey B. Dobson, L. Richard Carley, Kathleen M. Carley
 Winter Simulation Conference (WSC) 2024
- [C.5] **Simulation-Based Study on False Alarms in Intrusion Detection Systems for Organizations Facing Dual Phishing and DoS Attacks**
Jeongkeun Shin, L. Richard Carley, Kathleen M. Carley
 Annual Modeling and Simulation Conference (ANNSIM) 2024 - 🏆 **Best Paper Runner Up Award**
- [C.4] **Integrating Human Factors into Agent-Based Simulation for Dynamic Phishing Susceptibility**
Jeongkeun Shin, Kathleen M. Carley, L. Richard Carley
 International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS) 2023
- [C.3] **Beyond Accuracy: Cybersecurity Resilience Evaluation of Intrusion Detection System against DoS Attacks using Agent-based Simulation**
Jeongkeun Shin, Geoffrey B. Dobson, L. Richard Carley, Kathleen M. Carley
 Winter Simulation Conference (WSC) 2023
- [C.2] **Modeling and Simulation of the Human Firewall against Phishing Attacks in Small and Medium-sized Businesses**
Jeongkeun Shin, Geoffrey B. Dobson, L. Richard Carley, Kathleen M. Carley
 Annual Modeling and Simulation Conference (ANNSIM) 2023
- [C.1] **OSIRIS: Organization Simulation in Response to Intrusion Strategies**
Jeongkeun Shin, Geoffrey B. Dobson, Kathleen M. Carley, L. Richard Carley
 International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS) 2022

Publications - Posters

- [P.4] **A Machine Learning Surrogate Approach for Scalable Design Optimization in Cybersecurity Simulation**
 Siyuan Zhai, **Jeongkeun Shin**, L. Richard Carley, Kathleen M. Carley
 International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS) 2025 Poster Session
- [P.3] **Impact of Operating System Updates on Cybercriminal Access Duration: A Simulation-Based Study**
Jeongkeun Shin, Tanav Chngal, L. Richard Carley, Kathleen M. Carley
 Winter Simulation Conference (WSC) 2024 Poster Session
- [P.2] **Leveraging OSIRIS to Simulate Real-world Ransomware Attacks on Organization**
Jeongkeun Shin, Geoffrey B. Dobson, L. Richard Carley, Kathleen M. Carley
 Winter Simulation Conference (WSC) 2022 Poster Session

[P.1] Finding Integers from Group Orbits

Jake Shin, Yike Xu, Catherine Zhang, Xin Zhang, Junxian Li, Xin Zhang
Illinois Geometry Lab (IGL) Spring 2017 Open House

Publications - Technical Reports

[T.2] Attack Flow Network Models of MITRE ATT&CK Groups and Campaigns

Jeongkeun Shin, Siyuan Zhai, L. Richard Carley, Kathleen M. Carley
CASOS Technical Report (2025) - *Forthcoming*

[T.1] Revelation of System and Human Vulnerabilities Across MITRE ATT&CK Techniques with Insights from ChatGPT

Jeongkeun Shin, Geoffrey B. Dobson, L. Richard Carley, Kathleen M. Carley
CASOS Technical Report (2023)

Skills

Programming Languages: C, C++, C#, Java, Groovy, Python

Web Programming: HTML/CSS, JavaScript/jQuery, Node.js, React.js, TypeScript, Vue.js, PHP/MySQL

Simulation: NetLogo, Repast Simphony

Video Production: Davinci Resolve

Machine Learning: Weka, Pytorch

Game Development: Unity

Design: Adobe Photoshop, Google Sketchup, Blender

Optimization: IBM CPLEX

Network Analysis: ORA

Academic Services

Peer Review

- Computational and Mathematical Organization Theory [2025]
- The Journal of Artificial Societies and Social Simulation (JASSS) [2024 · 2025]
- Annual IDEaS Conference: Disinformation, Hate Speech, and Extremism Online [2024]
- International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS) [2024 · 2025]
- Winter Simulation Conference (WSC) Agent-Based Simulation Track [2024 · 2026]

Conference Services

- Session Chair, Annual Modeling and Simulation Conference (ANNSIM) 2026, Modeling and Simulation in Cyber Security Track

Talks

- University of Texas, El Paso, Cybersecurity and AI Reading Group, Guest Speaker [Spring 2026]
 - Network-Centric Cyber Defense: Optimizing Strategy and Resource Allocation in Multi-Stage Attacks
- CMU 17-821: Computational Modeling of Complex Socio-Technical Systems, Guest Lecturer [Fall 2024]
 - Agent-based Modeling and Simulation (ABMS) for Cybersecurity with OSIRIS