2023 15th International **Conference on Cyber Conflict: Meeting Reality (CyCon 2023)**

Tallinn, Estonia 30 May – 2 June 2023



IEEE Catalog Number: CFP2326N-POD ISBN:

979-8-3503-1283-6

Copyright © 2023, NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE) **All Rights Reserved**

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

CFP2326N-POD IEEE Catalog Number: ISBN (Print-On-Demand): 979-8-3503-1283-6 ISBN (Online): 978-9916-9789-3-1

ISSN: 2325-5366

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA

Phone: (845) 758-0400 (845) 758-2633

Fax: E-mail: curran@proceedings.com Web: www.proceedings.com



TABLE OF CONTENTS

Introduction	1
Unpacking Cyber Neutrality Scott Sullivan	9
The Law of Neutrality and the Sharing of Cyber-Enabled Data During International Armed Conflict Yann L. Schmuki	25
Obligations of Non-participating States When Hackers on Their Territory Engage in Armed Conflicts Marie Thøgersen	39
Privatized Frontlines: Private-Sector Contributions in Armed Conflict Tsvetelina J. van Benthem	55
Business@War: The IT Companies Helping to Defend Ukraine Bilyana Lilly, Kenneth Geers, Greg Rattray and Robert Koch	71
Evaluating Assumptions About the Role of Cyberspace in Warfighting: Evidence from Ukraine Erica D. Lonergan, Margaret W. Smith and Grace B. Mueller	85
The Irregulars: Third-Party Cyber Actors and Digital Resistance Movements in the Ukraine Conflict Margaret W. Smith and Thomas Dean	103
Analytical Review of the Resilience of Ukraine's Critical Energy Infrastructure to Cyber Threats in Times of War Andrii Davydiuk and Vitalii Zubok	121

Digital Supply Chain Dependency and Resilience Lars Gjesvik, Azan Latif Khanyari, Haakon Bryhni, Alfred Arouna and Niels Nagelhus Schia	141
Modeling 5G Threat Scenarios for Critical Infrastructure Protection Gerrit Holtrup, William Blonay, Martin Strohmeier, Alain Mermoud, Jean-Pascal Chavanne and Vincent Lenders	161
Toward Mission-Critical AI: Interpretable, Actionable, and Resilient AI Igor Linkov, Kelsey Stoddard, Andrew Strelzoff, S.E. Galaitsi, Jeffrey Keisler, Benjamin D. Trump, Alexander Kott, Pavol Bielik and Petar Tsankov	181
Zero-Day Operational Cyber Readiness Barış Egemen Özkan and İhsan B. Tolga	199
AI-assisted Cyber Security Exercise Content Generation: Modeling a Cyber Conflict Alexandros Zacharis, Razvan Gavrila, Constantinos Patsakis and Demosthenes Ikonomou	217
Request for a Surveillance Tower: Evasive Tactics in Cyber Defense Exercises Youngjae Maeng and Mauno Pihelgas	239
Towards Generalizing Machine Learning Models to Detect Command and Control Attack Traffic Lina Gehri, Roland Meier, Daniel Hulliger and Vincent Lenders	253
Human-centered Assessment of Automated Tools for Improved Cyber Situational Awareness Benjamin Strickson, Cameron Worsley and Stewart Bertram	273
Leveling the Playing Field: Equipping Ukrainian Freedom Fighters with Low-Cost Drone Detection Capabilities Conner Bender and Jason Staggs	287

Russian Invasion of Ukraine 2022: Time to Reconsider Small Drones? Aleksi Kajander	313
Weaponizing Cross-Border Data Flows: An Opportunity for NATO? Matt Malone	329
Limits on Information Operations Under International Law Talita Dias	345
Seeing Through the Fog: The Impact of Information Operations on War Crimes Investigations in Ukraine Lindsay Freeman	365
From Cyber Security to Cyber Power: Appraising the Emergence of 'Responsible, Democratic Cyber Power' in UK Strategy Joe Devanny and Andrew C. Dwyer	381
Sharpening the Spear: China's Information Warfare Lessons from Ukraine Nate Beach-Westmoreland	399
Cyber Diplomacy: NATO/EU Engaging with the Global South Eduardo Izycki, Brett van Niekerk and Trishana Ramluckan	417