Using Science in Cybersecurity
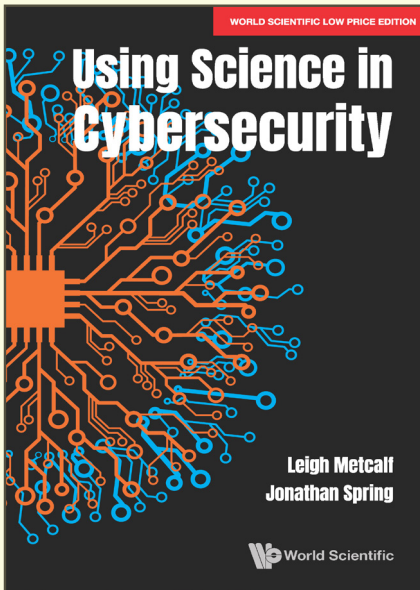
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ABOUT THE BOOK

Deploying the scientific method in cybersecurity today is a common-sense approach that is a tough topic in the field of cybersecurity. While most publications in the field emphasize that scientific principles are necessary, there are very few, if any, guides that uncover these principles.

This book will give readers practical tools for cybersecurity. It examines the path of developing cybersecurity foundations while taking into account uncertain data. Extensive examples demonstrate how to deploy cybersecurity to sort our day-to-day problems.

Using Science in Cybersecurity is intended for advanced undergraduate and graduate students, researchers and practitioners in the fields of cybersecurity, information security, and science of cybersecurity.

READERSHIP

Advanced undergraduate and graduate students, researchers and practitioners in the fields of cybersecurity, information security, and science of cybersecurity.

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- Introduction
- Data in Cybersecurity
- In Search of Truth
- Desirable Study Properties
- Exploratory Data Analysis
- Sampling in Cybersecurity
- Designing Structured Observations

- Data Analysis for Cybersecurity: Goals and Pitfalls
- DNS Study
- Network Traffic Study
- Malware Study
- Human Factors

ABOUT THE AUTHORS

Leigh Metcalf has a PhD in Mathematics from Auburn University, with a focus in Algebraic Topology and Dynamical Systems. After ten years in industry, Dr Metcalf has been working for more than a decade at CERT, part of Carnegie Mellon University as a researcher that challenges assumptions made in cybersecurity research. She is a published author in the fields of DNS analysis, Game Theory, Blocklist Analysis and other topics. Dr Metcalf has written and released opensource software and is the primary author of the book *Applied Mathematics and Cybersecurity*. She is the co-founder and co-editor-in-chief of the new journal *ACM Digital Threats: Research and Practice* (DTRAP).

Jonathan Spring is a senior member of the technical staff with the CERT division of the Software Engineering Institute (SEI) at Carnegie Mellon University, where he has worked since 2009. Prior posts include adjunct professor at the University of Pittsburgh's School of Information Sciences and research fellow for the ICANN's Security and Stability Advisory Committee (SSAC); he has served as program chair of FloCon and the New Security Paradigms Workshop. Dr Spring holds a doctoral degree in computer science from University College London. At the SEI, he produces reliable evidence in support of crafting effective cybersecurity policies at the operational, organizational, and national levels. His practice includes the areas of vulnerability management, machine learning, and threat intelligence.

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