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Decision and Game Theory for Security

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Preface

Securing complex and networked systems has become increasingly important as these systems play an indispensable role in modern life at the turn of the information age. Concurrently, security of ubiquitous communication, data, and computing poses novel research challenges. Security is a multi-faceted problem due to the complexity of underlying hardware, software, and network interdependencies as well as human and social factors. It involves decision making on multiple levels and multiple time scales, given the limited resources available to both malicious attackers and administrators defending networked systems. Decision and game theory provides a rich set of analytical methods and approaches to address various resource allocation and decision-making problems arising in security.

This edited volume contains the contributions presented at the inaugural Conference on Decision and Game Theory for Security - GameSec 2010. These 18 articles (12 full and 6 short papers) are thematically categorized into the following six sections:

- "Security investments and planning" contains two articles, which present optimization methods for (security) investments when facing adversaries.
- "Privacy and anonymity" has three articles discussing location privacy, online anonymity, and economic aspects of privacy.
- "Adversarial and robust control" contains three articles, which investigate security and robustness aspects of control in networks.
- "Network security and botnets" has four articles focusing on defensive strategies against botnets as well as detection of malicious adversaries in networks.
- "Authorization and authentication" has an article on password practices and another one presenting a game-theoretic authorization model.
- "Theory and algorithms for security" contains four articles on various theoretic and algorithmic aspects of security.

Considering that decision making for security is still a research topic in its infancy, we believe that this edited volume as well as the GameSec conference will be of interest to both researchers and students who work in this area and have diverse backgrounds.

November 2010

Tansu Alpcan
Levente Buttyán
John Baras

Organization

GameSec 2010, the inaugural Conference on Decision and Game Theory for Security, took place on the campus of Technical University of Berlin, Germany, during November 22–23, 2010. GameSec brings together researchers who aim to establish a theoretical foundation for making resource allocation decisions that balance available capabilities and perceived security risks in a principled manner. The conference focuses on analytical models based on game, information, communication, optimization, decision, and control theories that are applied to diverse security topics. At the same time, the connection between theoretical models and real-world security problems are emphasized to establish the important feedback loop between theory and practice. Given the scarcity of venues for researchers who try to develop a deeper theoretical understanding of the underlying incentive and resource allocation issues in security, GameSec aims to fill an important void and to serve as a distinguished forum.

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