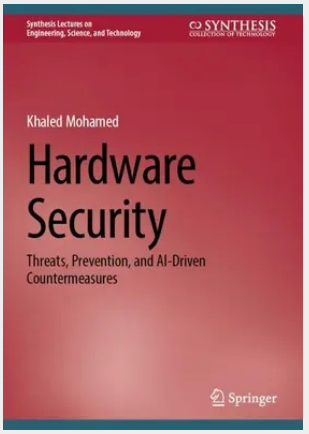
Mohamed

Hardware Security

Threats, Prevention, and AI-Driven Countermeasures



This book provides an effective guide to hardware security, presenting both conventional countermeasures and advanced AI-driven strategies for preventing, detecting, and mitigating security vulnerabilities. Topics covered include secure design practices, access control, obfuscation, Physically Unclonable Functions (PUFs), True Random Number Generators (TRNGs), side-channel analysis, and formal verification methods. The integration of AI and biologically inspired approaches, such as Artificial Immune Systems, is explored as a transformative tool for adaptive, self-learning defenses that enhance detection and response capabilities.

Intended for engineers, researchers, and security-conscious professionals, this book equips readers with practical insights and methodologies to protect modern digital systems against evolving hardware threats, ensuring reliability, trust, and resilience in an increasingly interconnected world.

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