Doctoral Research in Cyber Security: A Personal Perspective

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Natural vs Cyber Science

Elephant Problem

Cyber-Elephant Problem
Cyber Security Context

Science

Engineering  Business
Holistic Cyber Security Research

Objectives

Enable

Enforce

POLICY

What?

ATTACKS

Why?

Respond

Defend

Mechanisms

PROTECT

How?

Detect

Complement

Application Context

Enforce

Enable

Objectives

What?

Why?

Mechanisms

Application Context

Enterprise

Social

Cloud

IoT/CPS

Metaverse

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World-Leading Research with Real-World Impact!
Access Control

Discretionary Access Control (DAC) 1970

Mandatory Access Control (MAC) 1970

Role Based Access Control (RBAC) 1995

Attribute Based Access Control (ABAC)
Relationship-Based Access Control (ReBAC)
Usage Control (UCON)
2020s (Hopefully)
Holistic Access Control Research

Convergent Access Control (CAC)

Access Control Policy Models  Access Control Enforcement Models

Application Context
- Enterprise
- Social
- Cloud
- IoT/CPS
- Metaverse
- ...

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World-Leading Research with Real-World Impact!
Cyber Security
Doctoral Research

Conceptual

Theory

Implementation

World-Leading Research with Real-World Impact!
Cyber Security
Doctoral Research

Conceptual
OSI NW Stack

Theory
P = NP?

Implementation
RESTful API

World-Leading Research with Real-World Impact!
Cyber Security
Dissertation Structure

Ch 1: Introduction/Problem Definition/Summary of Contributions
   Thesis statement
Ch 2: Background/Related Work/Literature Survey

Ch 3: original contributions
   Ch 4: 1-3 conference papers/chapter
   Ch 5:

Ch 6: Conclusion/Future Work
Appendices: if appropriate