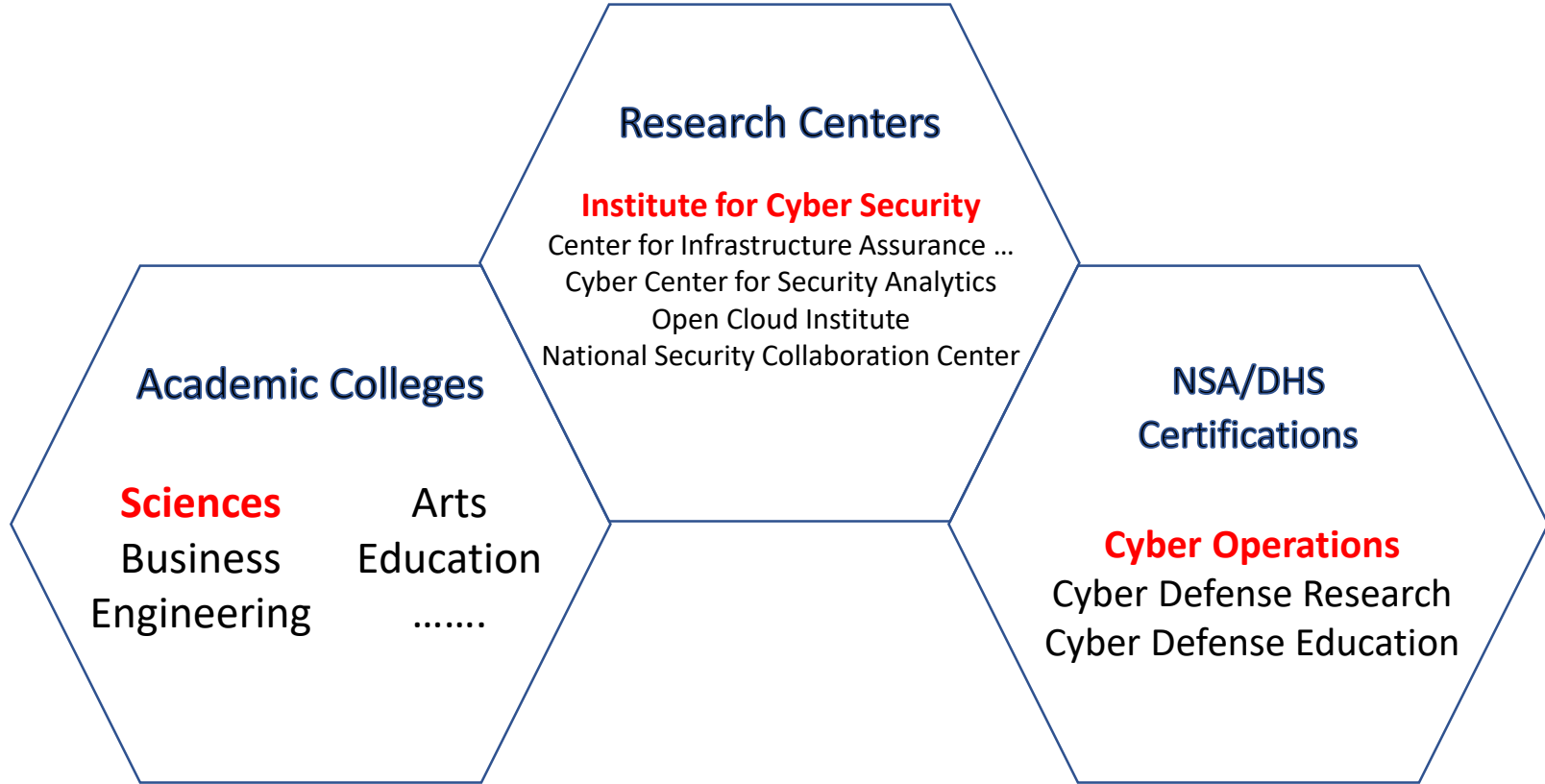

CS 6393: Cyber Security Models and Systems

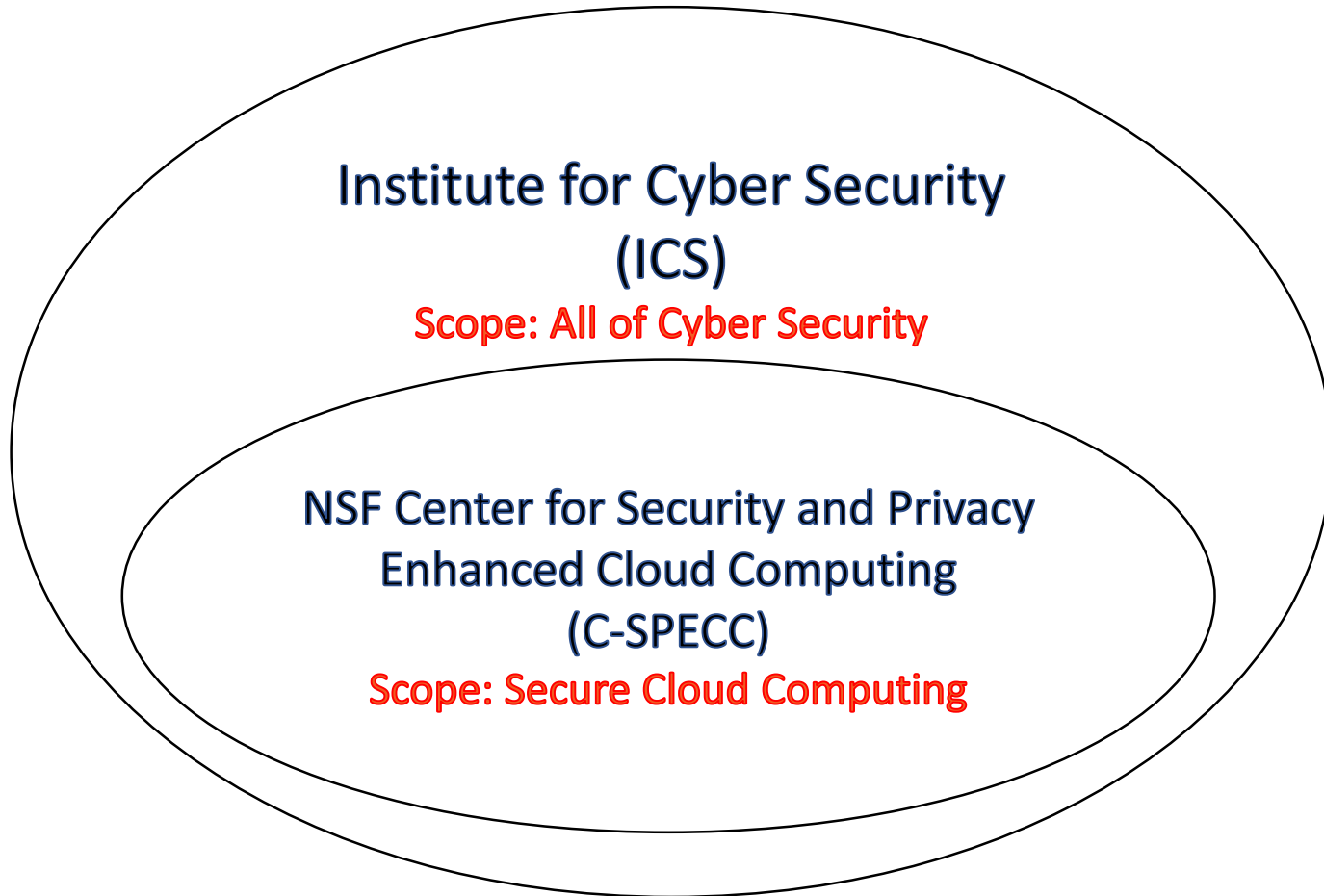
Cyber Security Perspective

Ravi Sandhu

Lecture 1
Spring 2020

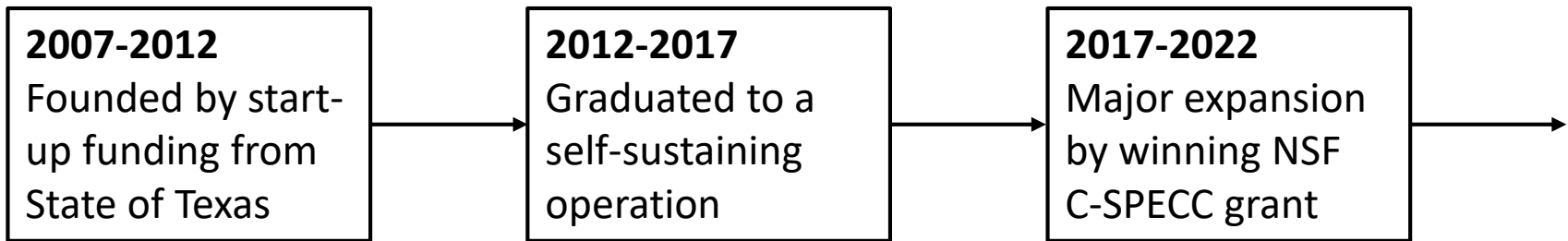


A strategic priority since 2000



MISSION

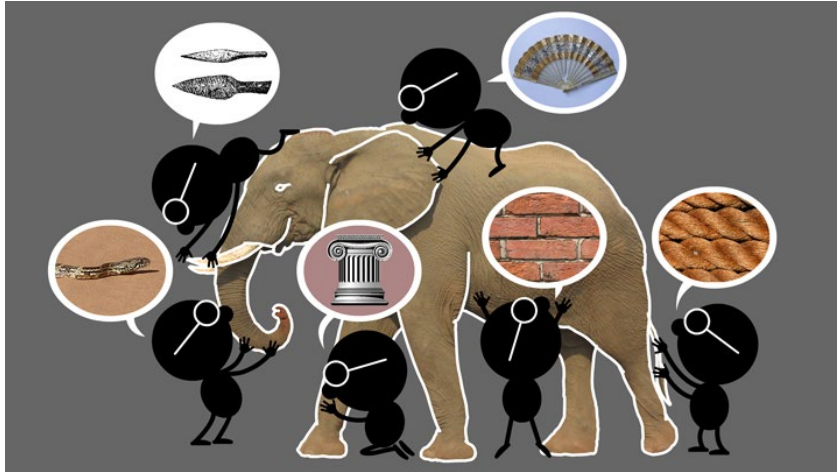
Sustained excellence in graduate-level sponsored research



- Established world class laboratories for:
Secure cloud computing &
Malware research

In collaboration with:
College of Engineering
College of Business
College of Education
Open Cloud Institute
Cyber Center for Security & Analytics
Partnership with 4 NISD High Schools:
Harlan, Woodson, Taft, Business Careers

Elephant Problem



Applied vs Foundational Science: Cyber-elephants require applied and foundational combined

Present vs Future Focus: Rapidly evolving cyber-elephants require future focus

Cyber-Elephant Problem



Objectives

POLICY

ATTACKS

Enable
↕
Enforce

What?

Why?

Respond
↕
Defend

Mechanisms

P
R
O
T
E
C
T

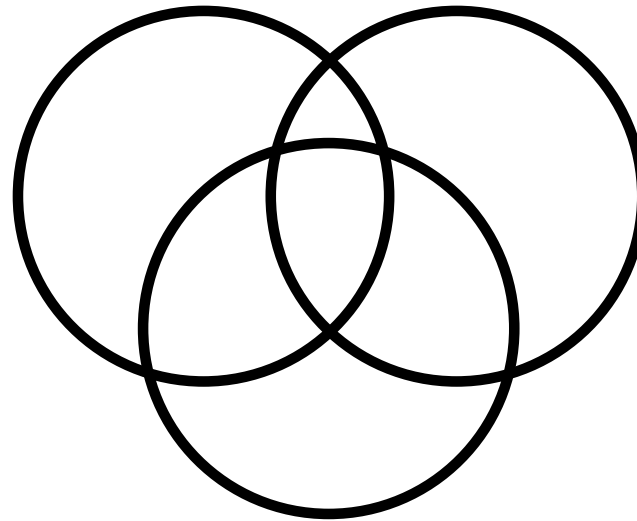
How?

D
E
T
E
C
T

Complement

**Control of read and write is
fundamental to all three**

INTEGRITY
modification

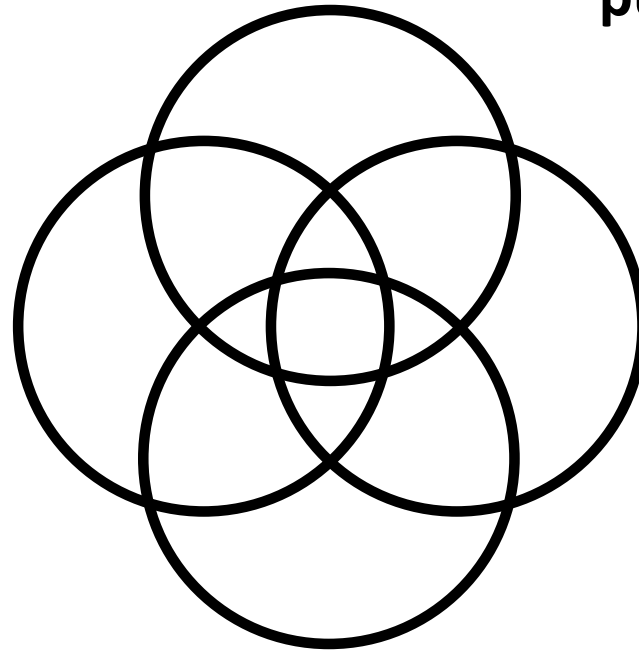


AVAILABILITY
access

CONFIDENTIALITY
disclosure

USAGE
purpose

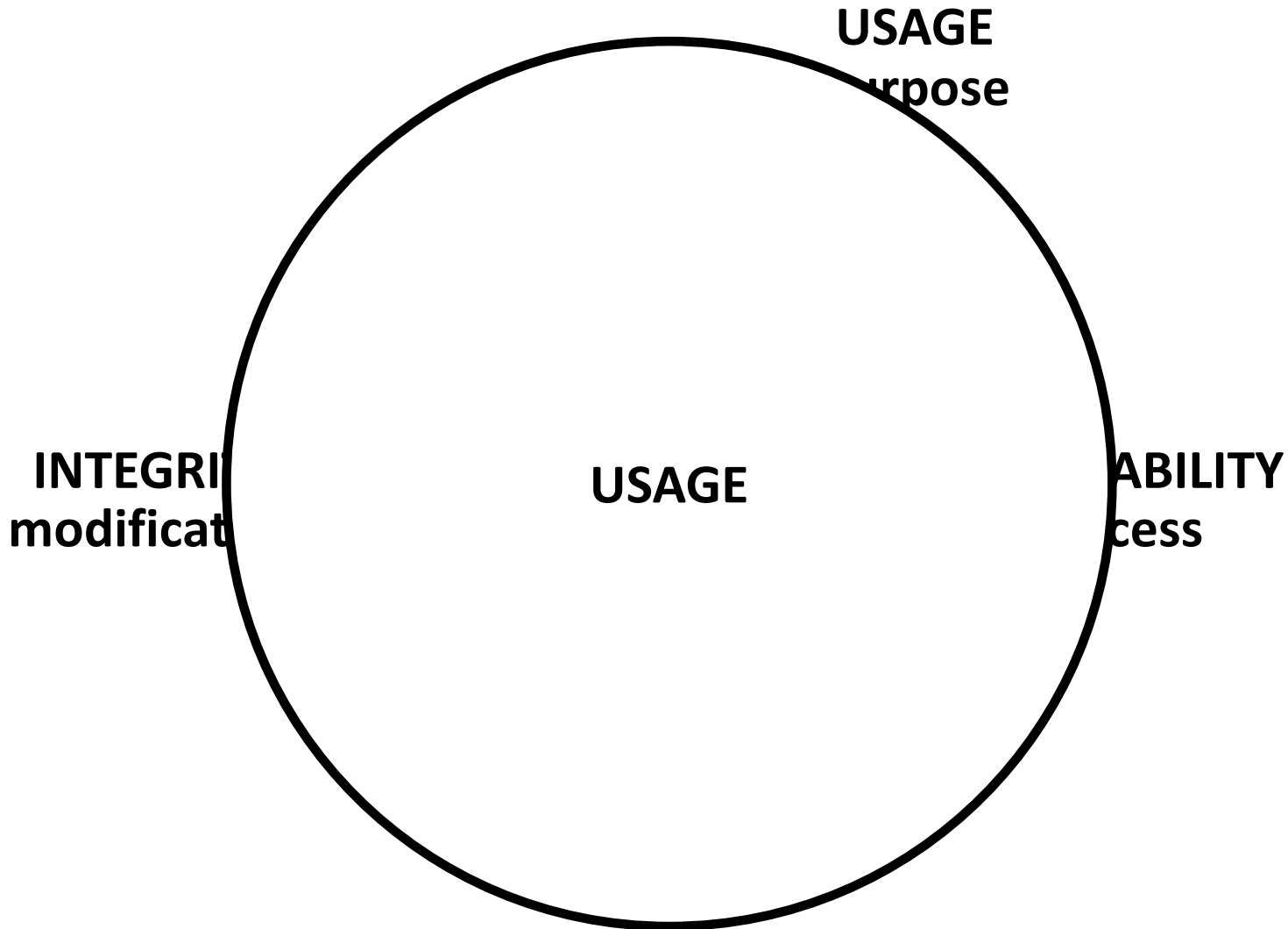
**Covers privacy and
intellectual property
protection**



INTEGRITY
modification

AVAILABILITY
access

CONFIDENTIALITY
disclosure



“My dear, here we must run as fast as we can, just to stay in place. And if you wish to go anywhere you must run twice as fast as that.”

— Lewis Carroll, Alice in Wonderland



- The ATM (Automatic Teller Machine) system is
 - ❖ secure enough
 - ❖ global in scope
- Similarly
 - ❖ on-line banking
 - ❖ e-commerce payments

- US President's nuclear football
- Secret formula for Coca-Cola

- Copy control
- Inference
- Analog hole
- Trusting humans vs trusting software
- Trusted computing base vulnerabilities
- Side channels and covert channels
-

- Computer security
- Information security =
 - ❖ Computer security + Communications security
- Information assurance
- Cyber Security
 - ❖ Includes cyber physical



- Computer security
- Information security =
 - ❖ Computer security + Communications security
- Information assurance
- Mission assurance
 - ❖ Includes cyber physical



- Data Security
- Network Security
- Operating System Security
- Privacy
-

