# UTSA's New Center

# Center for Security and Privacy Enhanced Cloud Computing (C-SPECC)

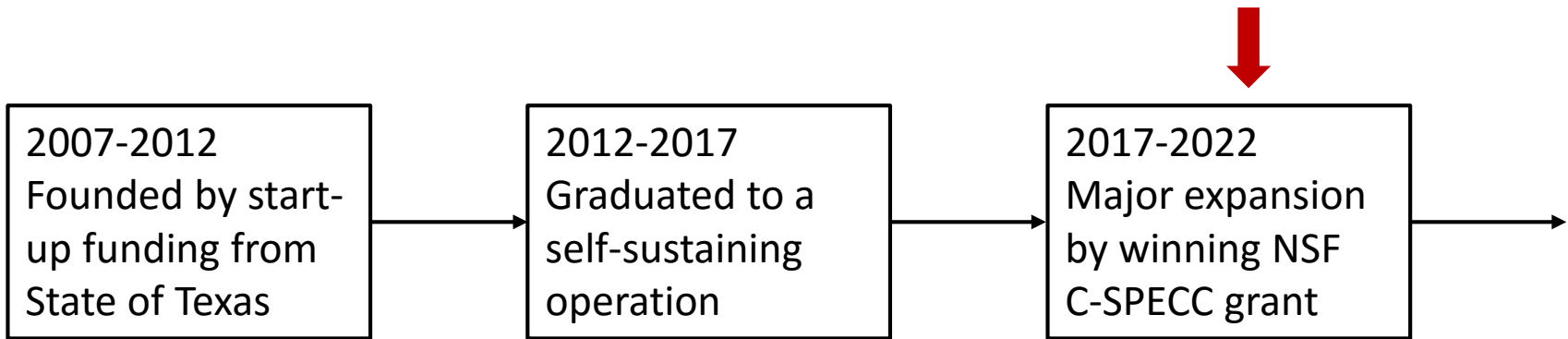Ravi Sandhu
Executive Director of ICS and C-SPECC

Professor of Computer Science
Lutcher Brown Chair in Cyber Security

College of Science, Research Conference, UTSA Campus
October 6, 2017

ravi.sandhu@utsa.edu
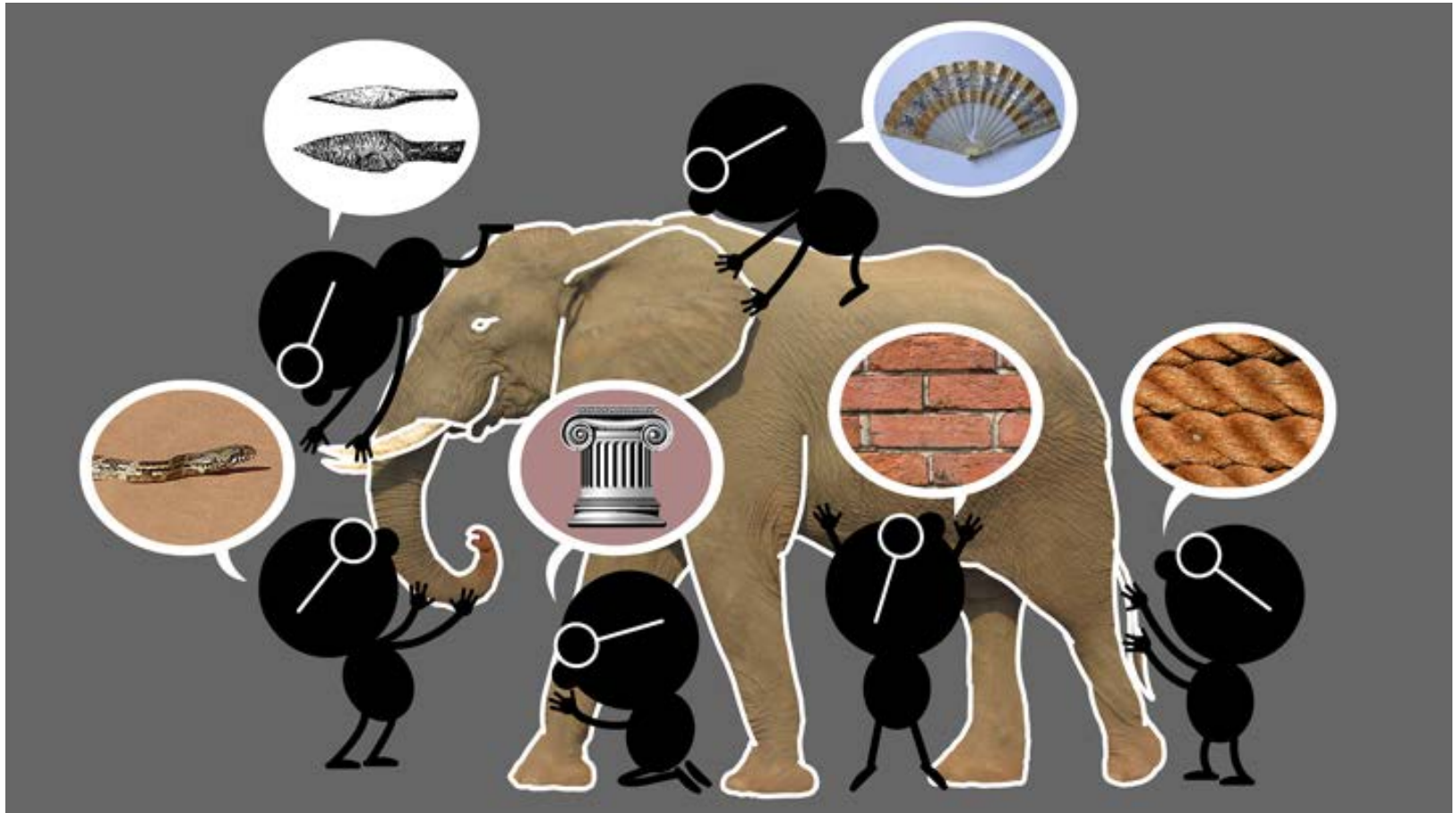www.ics.utsa.edu
www.cspecc.utsa.edu
www.profsandhu.com

*World-Leading Research with Real-World Impact!*

UTSA Computer Science

**ICS**
The Institute for Cyber Security

**C·SPECC**
Center for Security and Privacy
Enhanced Cloud Computing

## MISSION
## Sustained excellence in graduate-level sponsored research

| 2007-2012 Founded by start-up funding from State of Texas | → | 2012-2017 Graduated to a self-sustaining operation | → | 2017-2022 Major expansion by winning NSF C-SPECC grant | → |

**In collaboration with:**
College of Science
College of Engineering
College of Business
College of Education and
            Human Development
Open Cloud Institute
Cyber Center for Security & Analytics

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Computer Science

ICS — The Institute for Cyber Security

C·SPECC — Center for Security and Privacy Enhanced Cloud Computing

## The Elephant Problem

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## The Cyber-Elephant Problem

# ICS Research Philosophy

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# Applied and Basic Research Combined (ABC)

<span style="color:red">* The New ABCs of Research by Ben Schneiderman, 2016</span>

➢ Software:
Waterfall -> Agile and DevOps

➢ Security:
Waterfall -> ???

➢ Tech transfer:
Technology Readiness Levels (TRLs) -> ???

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TECHNOLOGIES

➢ Access Control

➢ Policy

➢ Malware

➢ Detection and Forensics

➢ Security Dynamics

APPLICATION DOMAINS

➢ Cloud Computing

➢ Internet of Things (IoT)

➢ Social Networks

➢ Enterprise

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## 5 Essential Characteristics

On-demand self service
Broad network access
Resource pooling (multi-tenant)
Rapid elasticity
Measured service

2009-2011
16 versions
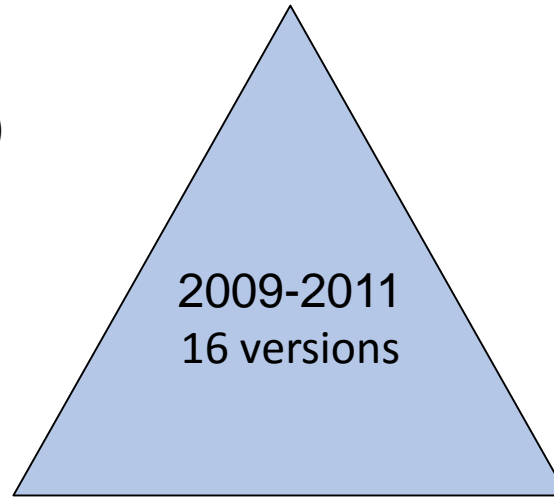
## 3 Service Models

Software as a Service (SaaS)
Platform as a Service (PaaS)
Infrastructure as a Service (IaaS)

## 4 Deployment Models

Public
Private
Community
Hybrid/Multi

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# Cyber Security Landscape

Center for Security and Privacy
Enhanced Cloud Computing

**Objectives**

| POLICY | | ATTACKS |

Enable     What?     Why?     Respond

Enforce                           Defend

How?

**Mechanisms**    PROTECT   ⟷   DETECT

Complement

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# C-SPECC Overview
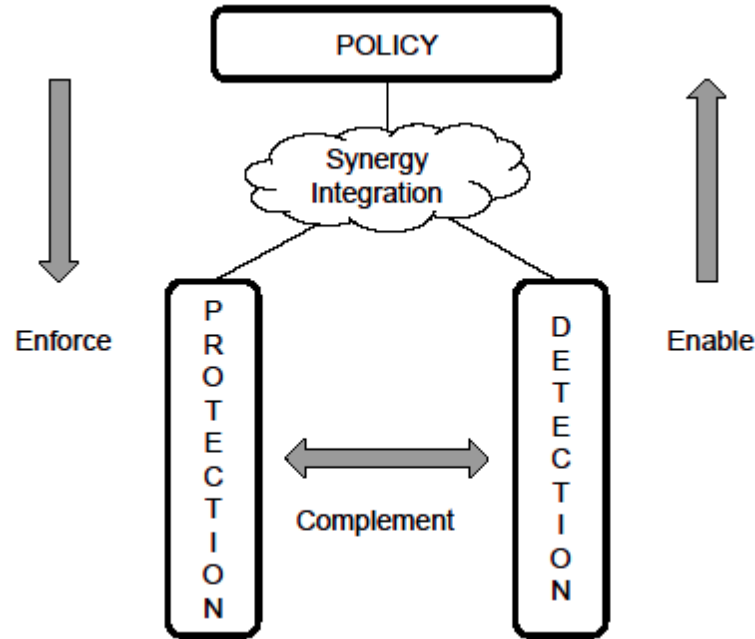
**C-SPECC Management**
*PI:* Ravi Sandhu (Director and Chief Scientist)
*Participants:* 4 Co-PIs + 1 Lead

**Education and Outreach Initiatives (E&O)**
*Co-PI:* Guadalupe Carmona
*Participants:* Elizabeth Pate, Ravi Sandhu

**Sub-Project 1 Protection**

Access Control
Private Computing
Protected Computing

*Co-PI:*
Ram Krishnan
*Participants:*
Shouhuai Xu
Meng Yu
Ravi Sandhu

**Sub-Project 2 Detection**

System Monitoring
Host Monitoring
Cloud Forensics

*Co-PI:*
Nicole Beebe
*Participants:*
Raymond Choo
Ram Krishnan
Palden Lama
Ravi Sandhu

**Sub-Project 3 Policy**

Policy Specification
Policy Composition
Policy Verification

*Lead:*
Jianwei Niu
*Participants:*
Nicole Beebe
Ram Krishnan
Meng Yu
Ravi Sandhu

**Multi-Cloud Laboratory (MCL)**
*Co-PI:* John Prevost
*Participants:* Yusheng Feng, Ravi Sandhu

**Partners**

**Industry Rackspace**
John Engates
Chief Technology Officer

**Industry NSS Labs**
Jason Brvenik
Chief Technology Officer

**High Schools NISD**
Anthony Jarrett
Executive Director of High School Instruction

**Federal NIST**
Matthew Scholl
Chief, Computer Security Division

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i.  Achieve national recognition for research, innovation and education in secure cloud computing

ii.  Increase participation of underrepresented groups in high tech computing

iii.  Pursue innovative research-based educational strategies for high school through doctoral level

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The University of Texas at San Antonio
Institute for Cyber Security (ICS)
Center for Security & Privacy Enhanced Cloud Computing
(C-SPECC)

**UTSA**

## C-SPECC MS & PhD RESEARCH SCHOLARSHIPS AVAILABLE

### Interested in

### Security and Privacy Enhanced Cloud Computing?

*Scholarships are now available*

*Scholarships will provide tuition, fees, and/or stipends for research assistantships with C-SPECC faculty*

Interested students **must meet** the following criteria:

- Be classified as a U.S. citizen, or permanent resident,
- Be enrolled full-time as a UTSA PhD graduate student, or a masters student with interest in pursuing a PhD in Computer Science (CS), Electrical & Computer Engineering (ECE), or Information Systems & Cyber Security (ISCS).

*Not a graduate student*

- Limited scholarships available for Junior and Senior undergraduates interested in continuing their education towards graduate degrees.

**Email REQUIRED documents to Suzanne.Tanaka@UTSA.edu:**

- Your Letter of Interest with related experience, and employment commitment,
- Your unofficial transcripts from MyUTSA/ASAP,
- Your Resume/Curriculum Vitae, and
- A Letter of Recommendation from a C-SPECC faculty member in CS, ECE, or ISCS.

**Direct questions to**
**Suzanne.Tanaka@UTSA.edu**

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