An Innovative Approach to Cyber-Security Education **Program for Protecting Critical Infrastructure**

Joseph Urban (IE), Vittal Rao (ECE), Susan Urban (IE), Qing Hui (ME), Sunho Lim (CS). Brian Nutter (ECE), Jordan Berg (ME), Victoria Sutton (Law), Sam Segran (CIO)

Texas Tech University





Vittal Rao

The U.S. needs critical human resources to combat growing cybersecurity threats, especially for our nation's critical infrastructure. Fully addressing cybersecurity education for the protection of critical infrastructure, however, requires extending the research and education process beyond traditional computing programs into other engineering disciplines. This capacity building research track project is developing an interdisciplinary, cybersecurity education program for engineers that must be aware of critical design issues for addressing cyber secured control systems for electromechanical devices, more effective techniques for the integration of secure software and hardware devices, and the law and policy issues that are essential to the research and development of cybersecurity measures. The curriculum consists of an interdisciplinary core that addresses information assurance, cyber physical systems, and law and policy, with multiple tracks that can be tailored to cybersecurity education within a specific engineering discipline.

> CS Track -Secure Software Engineering - Information Assurance

IE Track -Secure Software Engineering -Risk Assessment of Human

Curriculum consists of an interdisciplinary core that addresses:

-Network Security Embedded Systems -Mobile Networks

Behavior -Risk Modeling & Assessment

> ECE Track -Embedded Systems -Industrial Control Systems -Telecom Networks

 Information assurance •Cyber-Physical systems •Law and policy

• Multiple tracks for cybersecurity curriculum for a specific engineering discipline.

ME Track -Feedback Control of Dynamic Systems -Control Theory -Networked and Industrial

- Control Systems
- -Nonlinear Dynamics

Interdisciplinary Core -Cyber Security of Information Systems -Cyber Security for the Smart Grid -Cyber Security Law and Policy

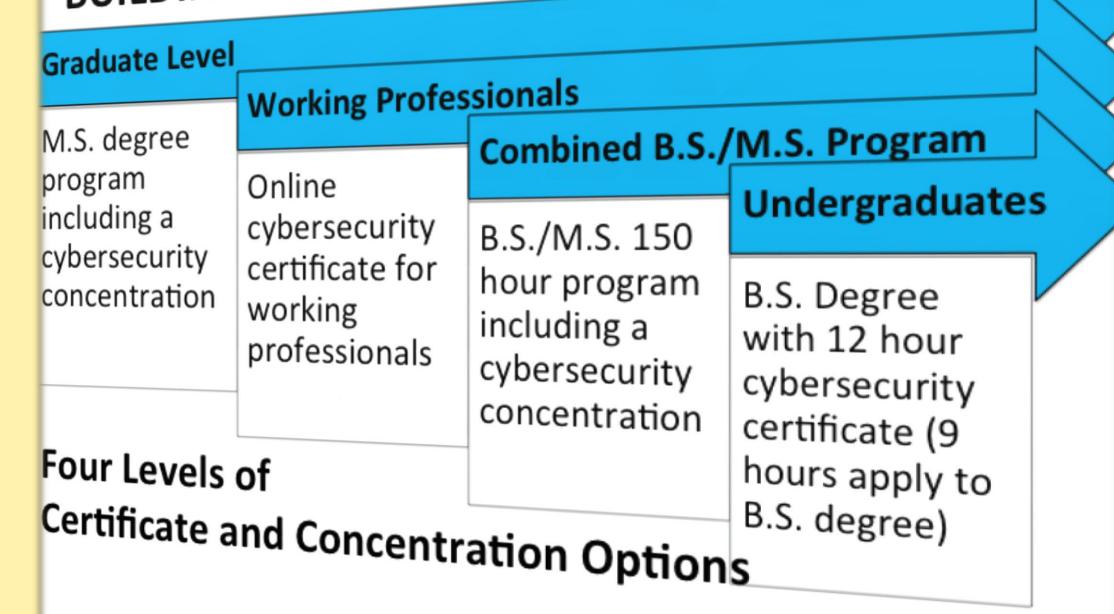
-Microprocessor Architecture

Approaches

•Collaborative/ interdisciplinary work between the following fields:

- Computer Science
- Industrial Engineering
- Electrical and Computer Engineering
- Mechanical Engineering Law School

BUILDING A CYBERSECURITY WORKFORCE



• Development of new coursework in cybersecurity and modification of some existing courses to address cyber-security issues.

Progress

Organized NSF-SFS Workshop on Educational Initiatives in Cybersecurity for Critical Infrastructure at Texas Tech University during November 8-9, 2012

Interested in meeting the PI's? Please contact: vittal.rao@ttu.edu;
Mobile (806-241-1243)



National Science Foundation WHERE DISCOVERIES BEGIN

NSF Secure and Trustworthy Cyberspace Inaugural Principal Investigator Meeting Nov. 27 - 29th 2012

National Harbor, MD