The Cluster to Advance Cyber-Security and Testing (CAST) of the University of Memphis represents a major interdisciplinary collaborative effort focusing on research, education, and technology transfer at the FedEx Institute of Technology. CAST comprises a consortium of experts in cyber-security testing who provide proactive leadership and cohesion to the region's responses to this constantly shifting cyber challenge. Private corporations based in Tennessee and state government agencies join together to tackle public policy questions and find cutting-edge technical solutions to protect their information and technology against cyber-attacks. With threats growing more sophisticated all the time, there is extraordinary pressure to "secure and deter."

The Program defines cyber security testing as a strategic and interdisciplinary area of interest encompassing all aspects of the cyber-security space. At a theoretical level it encompasses all forms of security challenges using a systems thinking approach to ensure the successful development and application of technology in business and government and beyond.

The CAST initiative is calling for proposals from faculty at the University of Memphis for interdisciplinary research pertaining to any aspect of cyber-security. It is looking to provide seed funding to 10-12 initial pilot projects averaging about $12k each that will help establish the University as the premier research hub for the art and science of cybersecurity. Proposals should be between 5 and 6 pages in length (Word or PDF format) and include the following: justification for research, theoretical basis, research method, contribution to both theory and practice, timeline and a short budget. Applicants are also encouraged to specify in their proposals opportunities and mechanisms for data collection and collaboration with industry, community and government partners.
Priority will be given to proposals that can: 1) directly benefit our regional community, corporate and government partners; 2) yield advanced content that can be included in CAST’s training and certification products; and/or 3) bring new ideas to CAST’s interdisciplinary research portfolio. Faculty whose proposals are selected for funding will be designated as CAST Research Fellows of the FedEx Institute of Technology. They will also be required to present their research at CAST’s annual Research Workshop.

Some specific examples of areas of research interest include the following but faculty are encouraged to propose other interdisciplinary aspects as well:

- Behavioral And Managerial Aspects of Cyber Security
- Behavioral and Policy Cyber Security Issues
- Connectivity, Traffic Flow, Econometrics, Applied Statistics in Security
- Cryptography, RSA, DES, SSL, TLS
- Cyber Network Security
- Cyber Laws and Regulations
- Cyber Security Testing
- Cyber Security and Healthcare, Compliance, HIPPA, Body Sensors
- Cyber Security and Portable Devices Security
- Cyber Security Applications for Electric Power and Energy Systems
- Cyber Security Attack Methods
- Cyber Security Management, e.g., compliance, social media privacy, insider threats, governance, etc.
- Cyber Security Policies, Standards And Practices
- Cyber-anomaly detection, optimization, evolving networks, crisis response
- Cyber-security Problems involving applied Statistics, statistical learning, nonparametric statistics, biostatistics
- Global challenges of cyber security
- HPC support for cyber-security research needing such resources
- Human aspects of technology use and, cyberbullying, cyber (cyber-psychology)
- Internet of Things Security, Industrial Control Security, Networking
- Network security, future internet architecture, network measurement and analysis
- Penetration Testing
- Proactive defense, information forensics, data analytics, cyber-physical systems, wireless and mobile systems
- Risk factor for attack, social engineering, cyber security, social engineering
- Risk-Based Security Testing
- Secure Design and Coding Techniques
- Secure Dynamical systems/networks/chaos
- Secure Geographic Information Systems, spatial data, geo-fencing
- Secure Machine Learning, Optimization, Software testing, Industry collaboration, Formal Methods
- Secure RFID, Internet of things, end user technologies, and Industrial control
- Security E-Fraud, Supply Chain, Auditing
- Security Impact on Cities (Memphis) and Society
Security Impact on Non-Government Entities
Security Impact on the Mid-South
Security Metrics and Governance
  Security-issues of Artificial Intelligence, Machine Learning, Cognitive Science/Neuro-science, abnormality detection, Security
Software Vulnerabilities
Supply Chain Issues and Optimization for Cyber Security
Testing Cryptography Security
Testing cryptography security and forensics
  Threat detection, risk evaluation testing and live intrusion detection
  Threat Detection, Risk Evaluation Testing and Live Intrusion Detection
Transportation engineering, Optimization, Game Network vulnerability/resilience
  Transportation Engineering, Optimization, Game Network Vulnerability/Resilience
Virtualization Security and Cloud Models
Web Application Security Testing

**Deadline for receipt of proposals is October 5th, 2015, please submit proposals as email attachments addressed to: Ms. Tammy Alexander at tlxander@memphis.edu.** A selection committee of cyber security experts and CAST leadership will review applications and select those for funding. Those submitting proposals will be notified regardless of outcome within several weeks of the committee’s meeting. To foster interdisciplinary collaboration, successful proposals may be clustered into distinct research groups under CAST that will be tasked with developing larger grant proposals from external granting bodies.

For further information please contact Drs. Dipankar Dasgupta and Robin Poston at rposton@memphis.edu or ddasgupt@memphis.edu.