

Understanding Human Cognition in Computer Network Defense

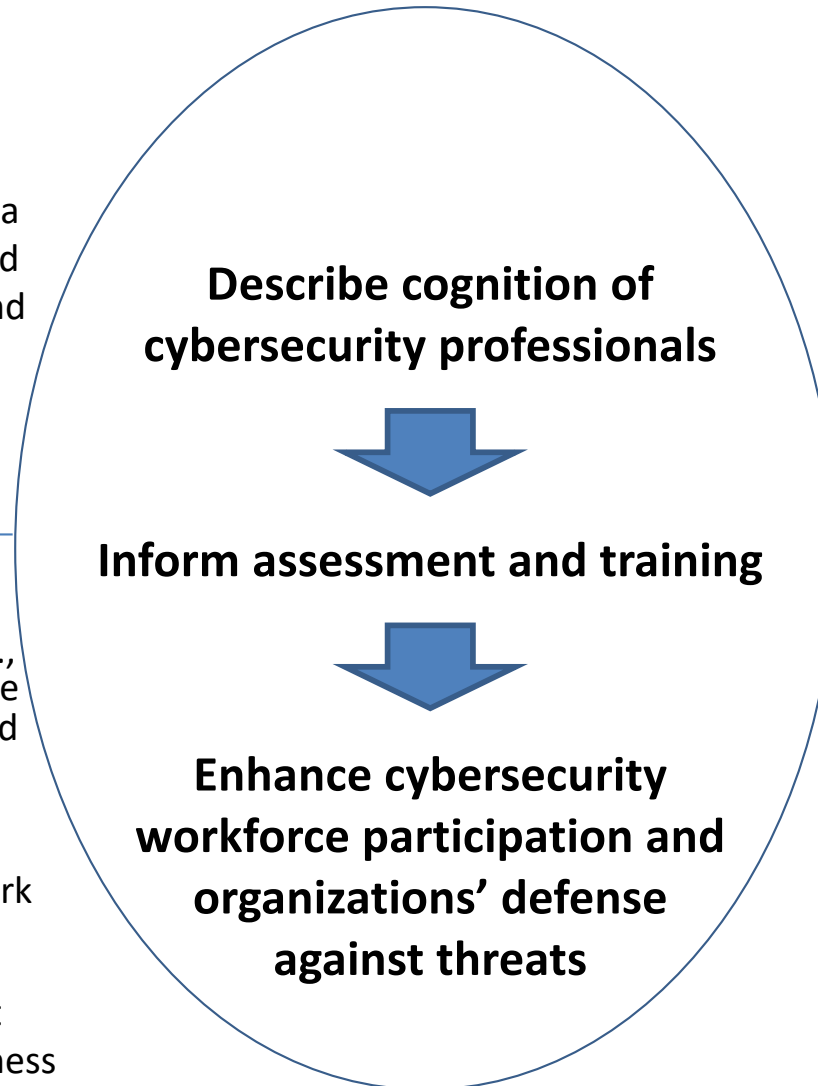
Challenge:

Cybersecurity professionals' decision making is critical to network defense. Meanwhile, a workforce shortage has created a need for effective training and evaluation of decision making skills that target specific cybersecurity job roles.

Solution:

Integration of frameworks (e.g., NIST NICE) with new knowledge from cognitive task analysis and simulation-based research to:

- Understand how mental models and situation awareness support network defense
- Support expertise using mental model assessment
- Measure situation awareness



Scientific Impact:

- New strategies for assessing the cognition of cybersecurity professionals
- Understanding the distinctive qualities of computer network defense in contrast to other sociotechnical systems
- Support training to develop expertise
- Inform the design of automation

Broader Impact:

- Develop the cybersecurity workforce by broadening career participation to those with required knowledge and skills, even if outside of traditional STEM pipelines.
- Guide the cyber defense strategies of organizations.
- Allow the cyber workforce to better adapt to an dynamic environment.
- Educate students in interdisciplinary social science research on the practice of cybersecurity.