CAREER: Understanding the Cognitive Processes of Computer Network Defense
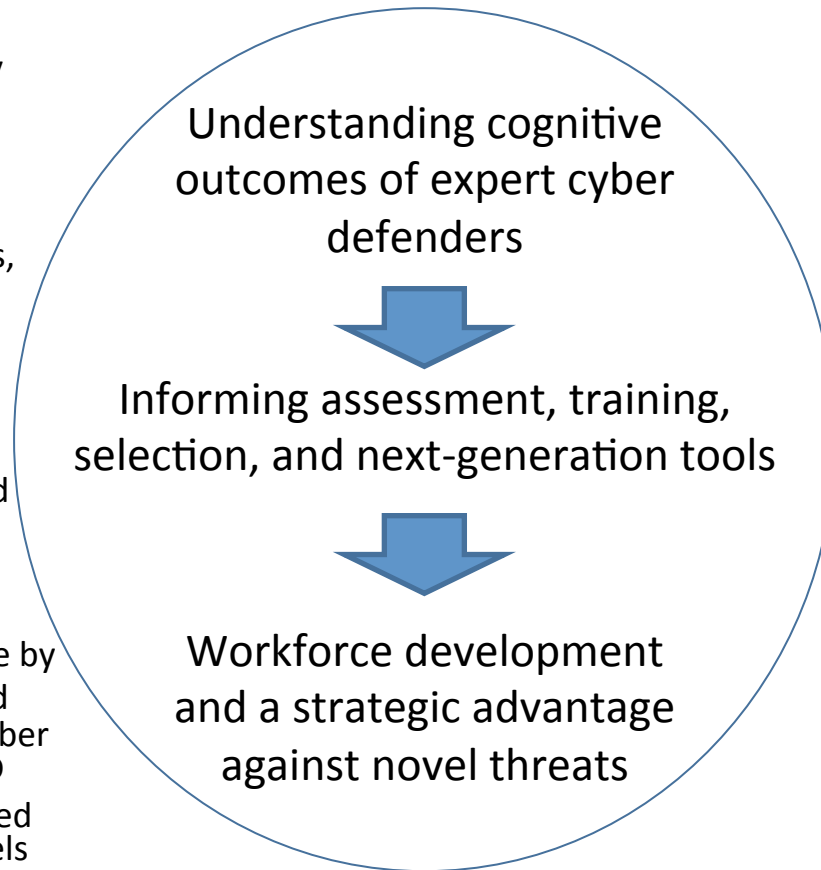
SJSU SAN JOSÉ STATE UNIVERSITY

Challenges:

- Effective decision making by cyber security professionals is a critical security layer
- Human mental models support situation awareness, but these cognitive factors are poorly understood in network defense contexts
- Unmet cyber security professional workforce need

Solution:

Identify cognitive outcomes that predict successful threat response by

- Investigating the content and structure of knowledge of cyber security professionals in CND
- Developing empirically derived assessments of mental models and SA for cyber security professionals

Understanding cognitive outcomes of expert cyber defenders

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Informing assessment, training, selection, and next-generation tools

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Workforce development and a strategic advantage against novel threats

Scientific Impact:

- Advancing the science of training and assessment with application to cyber professionals
- New knowledge of how mental models predict situation awareness and decision making

Broader Impact:

- Increased participation in cybersecurity careers beyond traditional career pathways
- Improved human decision making, allowing the cyber workforce to better adapt to a dynamic environment
- Informing the development of next-generation tools to capitalize on human cognition