

Building a Research Collaboration Network in Agriculture Cybersecurity

Introduction: In today's interconnected world, the agriculture sector faces unprecedented challenges related to cybersecurity. With the United States Department of Homeland Security designating Food & Agriculture as one of its 16 critical infrastructures, the need for robust cybersecurity measures in this sector has become increasingly apparent due to real cyber incidents targeting the Ag sector. In response to these challenges, we propose the establishment of **a hub and spoke model**, to foster collaboration, research, education, workforce development, outreach & engagement in agricultural cybersecurity. This model aims to bring together universities, industry partners, and stakeholders to collectively address the issues in the entire agricultural ecosystem – seed agriculture, plant agriculture, animal agricultural, ag automation & machinery, food processing, storage, and transportation and the food & ag supply chain.

Background: Agriculture has been undergoing a significant digital transformation including the deployment of Internet of Things (IoT) technologies and AI tools for data analytics, but many legacy digital systems such as supervisory control and data acquisition systems still exist. These together bring a unique set of cybersecurity challenges for the sector. Traditionally, cybersecurity was not a major concern in agriculture, but the evolving threat landscape necessitates immediate action. Cyber-attacks targeting the sector have increased, demanding interdisciplinary research, education, workforce development, and collaboration among academia, industry, and stakeholders.

Vision: Our vision is to create a sustainable innovation ecosystem dedicated to research, education, and workforce development in agricultural cybersecurity. The hub and spoke model will promote collaboration among regional universities, deepen stakeholder engagement, and lead to the formation of regional research centers. These regional centers will ultimately connect to form a national research network, fostering comprehensive solutions to agricultural cybersecurity challenges faced at the regional, national, and global level.

The regional hub and spoke model presents a comprehensive approach to addressing the pressing cybersecurity challenges in the agriculture sector. By combining insights from academia, industry, and stakeholders, we can harness the unique opportunities within these challenges and pave the way for a more secure and resilient agricultural ecosystem.

Collaboration Workshop: The upcoming workshop will provide a platform to initiate this critical collaboration and set the course for a brighter, more secure future for agriculture in the United States and the world. The goal of the workshop is to accomplish the following:

- **Foster collaboration** among academic partners and stakeholders.
- **Share knowledge** in Ag Cybersecurity among academic researchers and stakeholders.
- Discuss **research challenges and opportunities** in Ag Cybersecurity.
- Discuss **education and training challenges and opportunities** in Ag Cybersecurity.
- Develop an effective **collaborative model** for the research network.
- Develop an **action plan** for research, education, and outreach & engagement.