Agricultural Cyberbiosecurity

Cyberbiosecurity

Introduction

Technology is getting better and better every day. The things we use are getting "smarter". We have smartphones, smart watches, and smart assistants. Computers and advanced software are more important each day. Some things computers do on their own. Even this factsheet was partially written with artificial intelligence! Everything is getting more digital. We call this digitization.

With this digitization comes a new set of concerns. Everything collects data. Everything is connected to Bluetooth and Wi-Fi. Have you wondered about who has access to those connections? Maybe you have but have you what does that mean for us? As digitization becomes more common, we need to understand how technology works in our everyday lives. Importantly, how to keep everything safe! This combination of security in cyberspace, the real world, and people make up **cyberbiosecurity**.

Sita Kumari, farmer, uses mobile phone apps to enhance her yields and get access to markets and labor.

Key terms

- **Artificial intelligence:** Advanced algorithms that receive input and alter their behavior similar to the way the human brain works.
- **Big Data:** Data sets that are increasingly large and complex, in which we can find helpful trends that would not be otherwise apparent**.**
- **Digitization:** Adaptation of a system, process, etc. to be operated with the use of computers and the internet
- **Internet of Things (IoT):** The connectivity between different computers/sensors/products/processes via the internet.
- **Phishing scam:** A type of online scam that targets consumers by sending them an e-mail that appears to be from a well-known source – an internet service provider, a bank, or a mortgage company.
- **Precision Agriculture:** A farm management technique that uses observations and measurements to optimize production.

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Where We See Cyberbiosecurity

One place we see this happening is on farms. Farms are very digital now! Robots can prune weeds, drones can harvest fruit, and computers can water plants. We can do amazing things with technology, but it also means there is more risk of someone doing something bad with it. When there is a lot of technology in one place, like on a farm or a smart home, there are more ways for people, like hackers, to find ways to do bad things. Cyberbiosecurity works to find ways to keep our technology and data safe from these bad things.

On the farm, we see things like self-driving tractors, trackers on cows, and **sensors** in fields. These technologies are used to make more accurate decisions on how to grow our food, create fibers for clothes, and research medicine. We do a lot of important things on farms. We need to know how to protect them.

How to Protect Your Cyberbiosecurity

Check computers that run the equipment - Making sure these computers are working properly and are updated helps to keep things running smoothly. Fixing mistakes will keep new mistakes from happening. Updates will make sure the computers are as safe as possible.

Protect data - Data is sometimes the most important thing to farms! Making sure the data are protected from hackers and physical damage keeps farms running. Passwords and two-factor authentication make sure that only people who are supposed to look at have access. Saving data in more than one place means that if something happens to one you'll have a backup!

Learn about the risks - You only know what you know! Learning about new ways to protect data and computers also helps us stay safe! Ask for help protecting data and computers.

Keep systems safe physically too - Hackers aren't the only thing that can harm our data! Make sure important information and equipment stay dry, clean, and out of harm's way.

An autonomous tractor by John Deere

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Career connections

Computer Science
Agriculture
Engineering
Information Technology

Did you know? The College of Agriculture and Life Sciences at Virginia Tech has nearly 70 program options! Find your career connections at cals.vt.edu or email applytoCALS@vt.edu

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CAIA Scientist Spotlight

Rebekah Miller has always had a strong interest in food including cooking, eating, and learning about all types of food. Her interests led her to food science where she studied a variety of topics including food defense, biosecurity, and cyberbiosecurity due to their growing importance in the food industry. She currently works as a food scientist who researches flavor and aroma of edamame, also known as vegetable soybean. Rebekah was a CAIA Graduate Student Affiliate during graduate school at Virginia Tech.

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Acknowledgements

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This definition of OER is provided by The William and Flora Hewlett Foundation.

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- Student activity sheet
- Facilitator's guide

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