

Project Title: Secure data transfer in smart environments

Description of the Project:

In real-time smart farming, images are captured by various devices at the farms and sent to a server that processes these images to detect insects. In smart manufacturing, sensor data from physical machines are transferred to servers to enable real-time monitoring. Devices in smart environments over large complex networks are prone to cyberattacks, causing information leakage and data manipulation having disastrous effects. The project aims to protect smart environments by designing specific secure protocols for authentication using cryptographic primitives.

Task 1: Network traffic analysis

Task 2: Design and analysis of secure protocols using cryptographic primitives

Task 3: Programming protocols on devices

Task 4: Research paper writing

Preferred Skills:

- Good Experience in Python Programming,
- Knowledge of basic cryptography and socket programming
- Strong willingness to learn cryptographic libraries such as pycryptodome, scapy
- Strong willingness to learn Raspberry Pi
- Strong analytical and problem-solving skills to navigate challenges that arise during the project.
- Ability to learn new technologies and adapt to new information.
- Ability to work amicably in a team

What you will gain from the experience:

- Understand the process of research
- Design of cryptographic protocols
- Learn new tools and libraries
- Study of research papers
- Hands-on programming on Raspberry Pi devices
- Networking with research-oriented students