#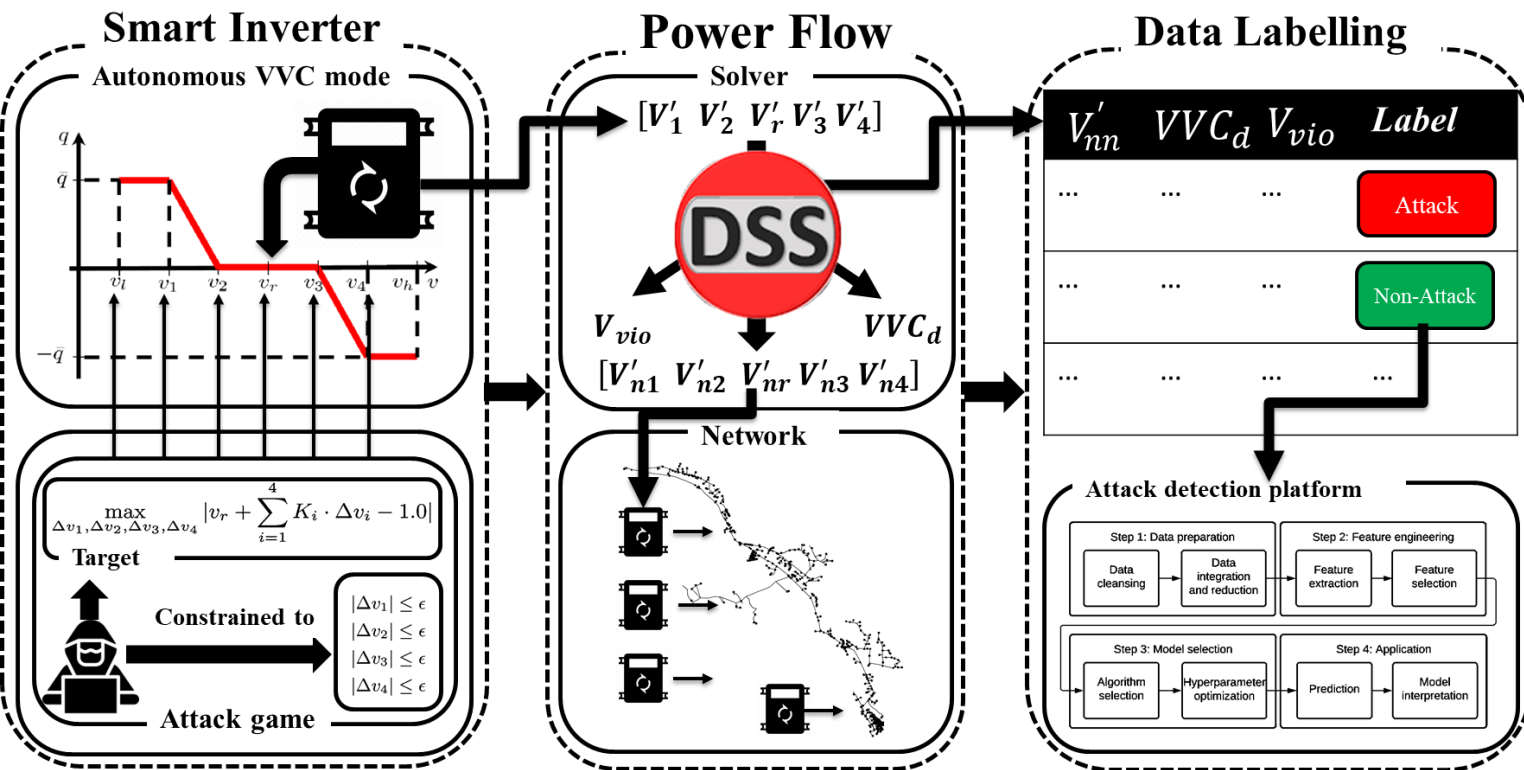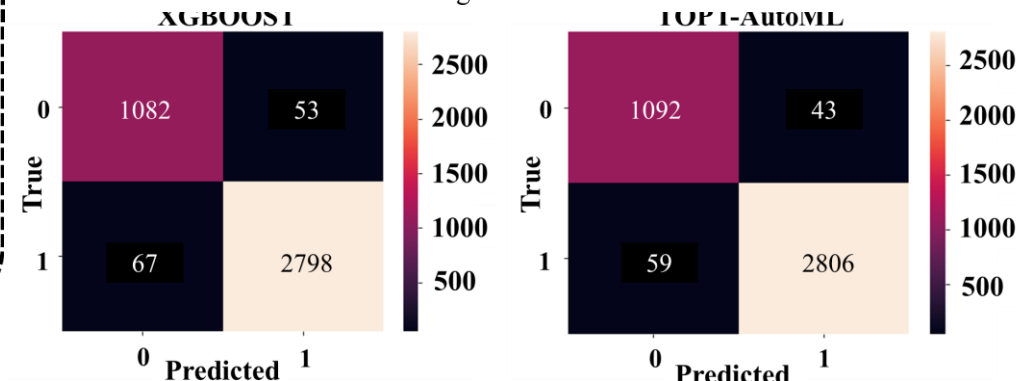 Project 1: Development of Cyber-Attack Detection Algorithms using the Smart Inverter and Machine Learning- **Sung Yeul Park**

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➤ A **round-attack game framework** to initiate attacks on smart inverters causing **severe voltage violations**.

➤ Used co-simulation model of **OpenDSS** to simulate these attack strategies and tuned **XGBOOST and TPOT-AutoML** for detection, achieving **precision rate of 97%.**
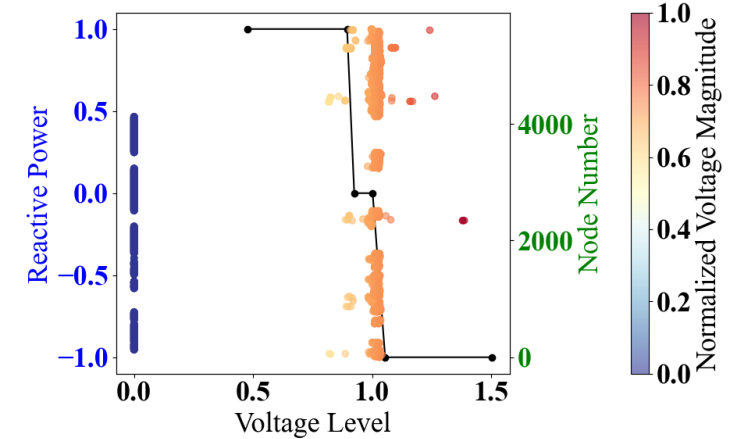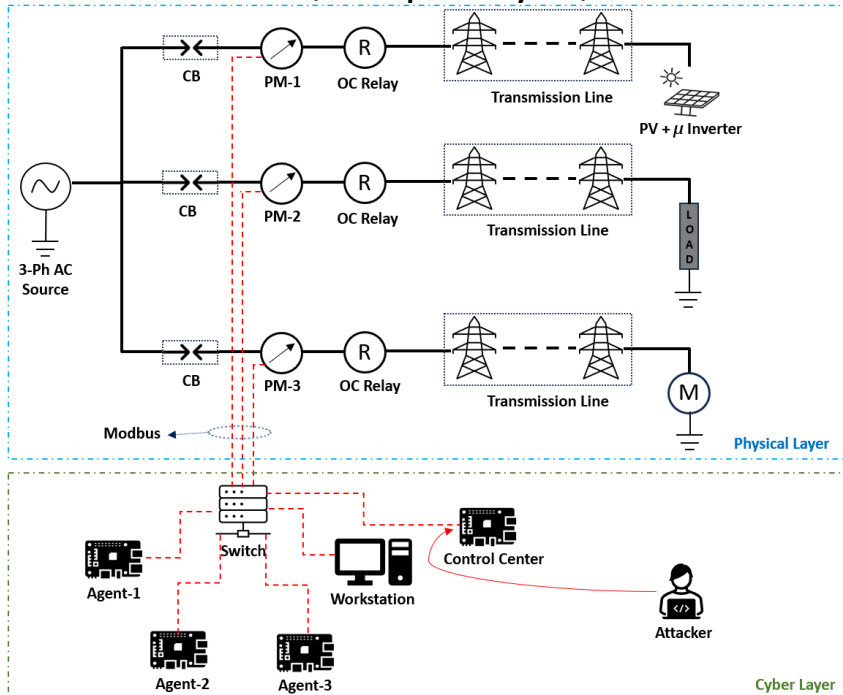
Project 1: Development of Cyber-Attack Detection Algorithms using the Smart Inverter and Machine Learning- **Sung Yeul Park**

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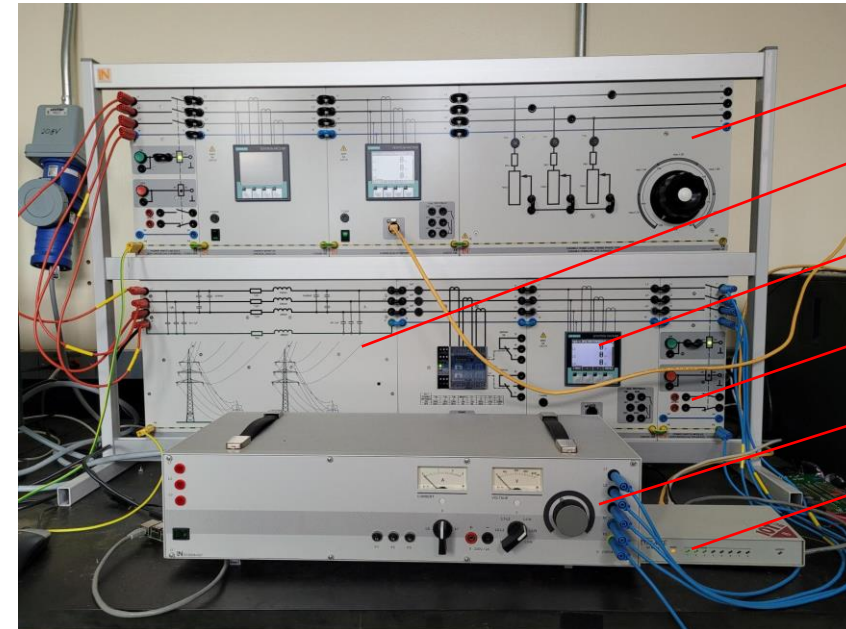
Detect cyber-attacks using smart inverter

- Revise the available three-phase inverter evaluation module
- Integrate into the three-phase testbed

Cyber Physical Security Hardware Testbed

- Lucas-Nuelle Module is the three-phase power bus testbed
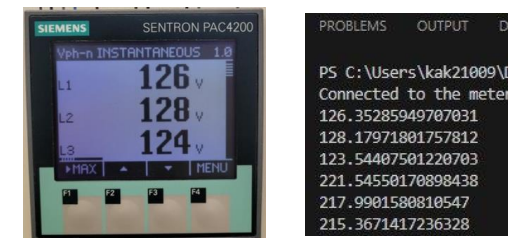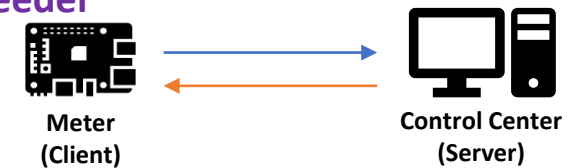- Add smart inverter, Raspberry Pi, Network cards

Lucas Nuelle Modules for one feeder

- Load (controlled)
- Transmission Line
- Power Meter
- CB Module
- 3-Ph AC Source
- Network Switch

Overview of the CPS layout

Modbus protocol:

- Supports **TCP** and Serial Communications
- SIEMENS PAC4200 meters are used for **Clients**.
- Raspberry Pi devices are used for **Servers**.
- **Denial of service (DoS)** attacks will be implemented

Meter (Client)   Control Center (Server)

Meter Reading Data