

Kristine Christensen

Mentor 1: Dr. John Holmen, ORNL

Mentor 2: Charlie Dey, TACC

Home Institution: Moraine Valley Community College

Target Course: IoT Fundamentals (no prereqs)

Target Course Number: LAN 120.300 (Freshman/Sophomore)

Anticipated Enrollment: 24

Offered: Fall & spring, with at least one section offered each semester



Science Gateways Goal:

Develop a Science Gateways-based learning experience that enables introductory community college IoT students to analyze authentic and student-generated sensor data using Jupyter notebooks and Jetstream resources, helping them understand how IoT data can be visualized, analyzed, secured, and scaled beyond a single device.

Science Gateways Resource Needs/Questions:

- Guidance selecting an appropriate science gateway, cloud, or HPC environment.
- Help creating a beginner-friendly, browser-based Jupyter environment and recommendations for introductory IoT, sensor, cybersecurity, and critical infrastructure datasets.
- Support adapting or developing scaffolded notebooks for data exploration and visualization.
- Guidance for allowing students to upload and analyze data collected from their own sensors.

Project Goals:

- Introduce entry-level IoT students to science gateways, public datasets, Jetstream 2, Jupyter notebooks, cloud computing, and HPC resources.
- Develop foundational notebook and visualization skills through scaffolded activities designed for students with no prior Python or HPC experience.
- Help students run prepared code, modify selected variables, visualize authentic IoT and industrial data, and interpret the results.
- Introduce AI-assisted anomaly detection, cybersecurity, and critical infrastructure applications in an approachable manner.
- Guide students in transferring these skills to a sensor-based final project in which they collect, analyze, visualize, and report on their own data.