# PAWR Program

## Developing Advanced Hands-On Labs

Lightning Talk (Requirements/Standards)

SDMAY24-20

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# Project Goal

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## The Challenge:

On August 1, 2023, GENI (Global Environment for Network Innovation), a virtual lab environment used for simulation of networking and systems for research and education, shut down its servers and effectively went defunct.

Iowa State has used GENI  for networking classes in the past (CPR E 431, for example). As a result of GENI's shutdown, our goal is to find alternative platforms to research, develop, and test networking and cybersecurity labs using their resources and environments.

## The Solution:

The goal of this project is to research and analyze a variety of platforms that educators can use to replace GENI within their curriculum. In the end this will take the form of a publishable research paper comparing and contrasting the various platforms we discover and their potential use cases.

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# Requirements

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## Functional Requirements:

Building & Designing labs dedicated to Network and Security on various platforms like *Geni* (a now deprecated open infrastructure distributed research system) that will hold their longevity.

Develop relevant lab documents to accompany various activities and programs (Around 4-10 full scale labs).

Create Interactive Learning Materials with supported research and documentation.

## Non-Functional Requirements:

Researching various platforms and programs to simulate real world network activities and security threats.

Project needs to be completed before May 2024.

Project members are expected 8-10 hours of research and involvement within each week.

Access to the internet and a computer.

# Engr. Standards

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## Engineering Standards to Come

At the current moment, our project requires an in-depth analysis and research on various platforms and programs to find out the most suitable and versatile tool.

Based on our research, we suspect that each will have their own legal and handling standard that will be respected and honored.

## Standards & Expectations

We are expected to have high-level and high quality research standards that can elaborate and describe complex problems to simple solutions.

We are expected to follow Iowa State Universities high lab documentation standards when organizing deliverables with accompanied research as well as the IEEE formatting standards while writing the research document.

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# Hardware Standards

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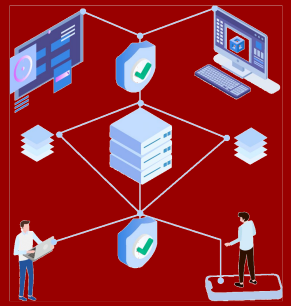
IEEE standards employed on platforms

- 802.11ad (5G)
- 802.11a/b (wireless ad hoc networks)
- 1733-2011 (Transport layer)



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# Platforms

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## ARA Wireless Living Lab for Smart and Connected Rural Communities

ARA is a first of its kind wireless testbed for rural communities located the Ames area. This platform deploys advanced wireless, edge and cloud equipment. The purpose of the platform is to facilitate research of wireless solutions for rural and agricultural needs as well as network capabilities in rural areas.



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# Platforms

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## Colosseum

Colosseum is a platform that focuses on emulating networks in a number of different environments for research and development of new radio network tech. This platform is backed by a large amount of high performance hardware such as Massive digital Channel Emulator(MCHEM)

COLOSSEUM
at Northeastern University

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# PAWR Program

## Developing Advanced Hands-On Labs

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# Citations

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*Ara Wireless Living Lab*. ARA. (2023, July 16). https://arawireless.org/

Colosseum. (n.d.). https://www.northeastern.edu/colosseum/

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