

# **NCYS-I Project Proposal**

## **RFID Blocker**

### **Group Members:**

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## **Introduction**

In today's academic environment, universities increasingly depend on RFID-based access control systems to manage campus security and identity verification. While RFID technology offers convenience, it also introduces potential vulnerabilities that can be exploited by malicious actors.

This project proposes the development of an RFID Blocker system, specifically tailored for educational institutions, to enhance security and prevent unauthorized access.

## **Project Objectives**

The primary objective is to design and implement a C++-based RFID Blocker that ensures privacy and safety for faculty, staff, and students. The key goals include:

- Developing a robust C++ program easily integrable with existing university access control systems.
- Ensuring compatibility with a wide range of RFID cards and tags, including student ID and staff access cards.
- Implementing secure authentication and encryption mechanisms to prevent unauthorized facility access.
- Testing the system's ability to block unauthorized or rogue RFID signals effectively.

- Providing a user-friendly interface for university administrators to configure and monitor the RFID Blocker settings.

## **Additional Feature: QR Code Authentication Module**

To supplement RFID protection, the project will include a QR Code generation module within the same C++ application. This module will:

- Generate secure, time-sensitive QR codes for identity verification
- Allow students and staff to use QR codes as alternative access methods
- Enhance the system's multi-factor authentication capabilities

## **Technical Scope**

- Language: C++
- Tools: C++ Standard Library, potential external libraries for QR code generation
- Hardware Interface: RFID scanner simulation or integration (subject to availability)
- Security Measures: Basic encryption for stored ID data, signal blocking algorithms
- Platform: Console-based interface with scope for future GUI enhancement

## **Significance and Learning Outcomes**

This project will provide practical experience in:

- Developing cybersecurity solutions in a low-level programming language (C++)
- Understanding and mitigating real-world threats to RFID systems
- Implementing basic cryptographic and signal-blocking mechanisms
- Bridging theoretical concepts of network and cybersecurity with hands-on application

The project will contribute towards a safer and more resilient access control framework in educational environments, showcasing the use of programming for physical security enhancement.

## **Conclusion**

This project aims to combine cybersecurity principles with programming expertise to build a working solution for RFID security enhancement in universities. By addressing current vulnerabilities in RFID-based systems and offering an additional secure QR-code-based mechanism, this project provides both practical value and academic learning.

We are excited to implement our solution and gain deeper insight into network security and secure system design