RFID Based campus Access Monitoring

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1. Introduction

RFID (Radio Frequency Identification) tags are small electronic devices that contain a unique identification number and a small antenna. These tags can be embedded into objects, such as ID cards to be read by an RFID reader without the need for physical contact.

In the case of ID cards, an RFID tag can be embedded in the card, which can be used to uniquely identify the individual carrying the card. When the card is brought near an RFID reader, the reader sends out a radio signal, which the tag picks up and uses to transmit its unique identification number back to the reader. This can be used for quick and efficient identification of individuals.

RFID tags can be used for individual identification in various applications, including efficient access control and monitoring.

1. Premise

KIIT University, Bhubaneswar has a vast, open campus. While being beneficial in a multitude of ways, it may be seen as a daunting task by some to be traversing this vast campus past sundown. As a result, students are seen as not able to utilize certain facilities such as the library, gymnasium, etc. after a certain time confidently and are generally advised against it for their own safety by their peers.

Another fundamental flaw is that there is no effective way to find out the location of a student within in the case of any delays or emergencies. As a result, boarders, and especially the female students face extreme scrutiny at their hostels as a result of any even slightly unexpected delay in returning. This proposal will also ensure that students are provided with a buffer period past the in-time, in genuine cases of unexpected delays.

The aim of this proposal is to provide a solution that will effectively address the safety concerns on the university campus and provide a reliable solution in tracking student presence inside various parts of the campus to ensure the safety of students is never compromised, in a manner that does not violate any individuals’ privacy.

1. Objectives

* Provide an effective method of logging student activity on campus grounds within certain hours.
* Integrate the access control system with the central database to enable real-time monitoring.
* Provide a save environment for students after sunset and restrict unauthorized access to specific sections of campus.
* Develop a plan for expanding the access control system to other areas of the university, such as dormitories, libraries, and other academic buildings.
* Design the system in a cost effective way that will be easy to implement in the shortest possible timespan.

1. Project Methodology

* We will divide the project into four phases: planning, design, implementation, and testing.
* During planning, we gather requirements and select possible points of deployment.
* As part of design, we will develop wireframes, user interface designs, and a database schema. We will use design thinking principles to ensure that the system meets user needs and is intuitive to use.
* The implementation phase will see the deployment of our hardware in certain starter points such as Campus 15 Block A, the Main Gate, and The Central Library.
* Finally, the testing phase will see a small pool of selected students being given RFID enabled ID Cards for a short testing period which will allow a live demonstration of the design.

1. Implementation

The implementation will be in the following manner:

A scanner array is positioned at points of entry/exit (3 for testing phase) equipped with RFID readers and communicating with the central database. This will keep a track of all movement through the gate.

To prevent data overload, this is kept deactivated until a set time after sun down. After normal class hours have concluded, the system will be activated.

After a certain time, past sun down (7:00 pm for example), ID cards will be made *mandatory* to pass through any campus gate. Students possessing RFID cards will be able to log their movements into the database. Every student will have a profile on the database which will make a new log every time he or she passes through one of our gates along with the current time.

Additionally, it will maintain a “Current position” value, which will always be updated to show their last point of entry/exit (i.e., “Campus 15” or “Library”). This provides an effective way for their respective hostel in-charges to be informed about their whereabouts. This will also promote the habit of carrying ID Cards at all times among students.

The purpose of this system is to enhance safety and enable students to use university facilities after dark. It is not intended to keep a strict eye on students, but rather to provide a streamlined and user-friendly solution that enables students to feel secure while utilizing these facilities at night, while making sure their privacy is not violated.

Further, in the case where a student has a genuine cause of delay in returning to hostel, they can avoid unnecessary scrutiny by having a log of their movements throughout campus. This will also enable female boarders to access the library facilities safely during the night time as their respective hostel in-charges can be well informed about their whereabouts and movements.

1. Summary

The proposal is to build a network that will provide the students of KIIT University, Bhubaneswar with a useful tool that will ensure their safety while allowing free passage throughout the campus.

Implementation of this system will have several benefits to students, including but not limited to:

1. Promoting the habit of carrying ID Cards at all times
2. Logging of visitors to specific areas of the campus
3. Providing assurance with regards to safety and whereabouts of students while not in hostel
4. Extended time limits for those genuinely involved in academic tasks such as projects and/or library visits
5. Increased student engagement and productivity as the burden of strict scrutiny due to late hostel entry is removed
6. Reduction in unauthorized access to academic and specialized sections