SCIENTIFIC REPORT ABOUT THE CONFERENCE PARTICIPATION AND PHD THESIS DISSERTATION

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Outline/structure of the presentation

- Description of a conference
- Description and discussion of my research paper presented in this Conference
- Description of my PhD thesis
- Conclusion
- Questions, comments

Conference Information

The Name of the Conference: International Conference on Web & Open Access to Learning, Nov. 25-27, 2014, Dubai, UAE.

Organized by: Canadian University of Dubai, UNESCO, and IEEE (UAE Section)

More than 200 participants all around the world, and some outstanding keynote speakers, like Mike Sharples, Carlo Ratti, Pierre De Villiers, and Fanny Klett

Meantime, organizers prepared very impressive social program, and everything was prepared at high-level!

About my research paper

Title: NFC-enabled Access Control and Management System

About how to control doors with a help of smartphones!

About my defense

Title: **System of control and identification based on RFID-technology: architecture, structure, implementation and application**

Major: 6D070300- Information Systems

Supervisors: Doctor of technical sciences, Prof. Beysenbi Mamyrbek Aukebaevich

PhD, Prof. Nikulin Vladimir (State University of New York at Binghamton, USA)

Consists of two main subsystems:

Students Attendance Checking system;

Staff Control system

and some additional modules like

- Library module

- Canteen and campus- shopping module, and so on…

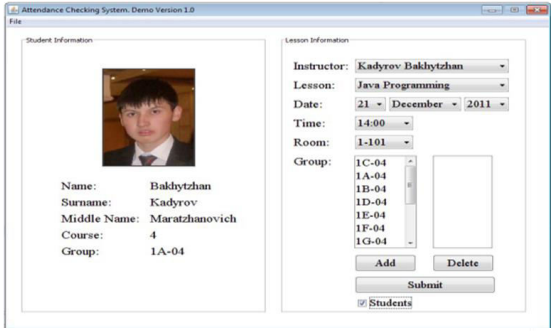
Students' Attendance checking system

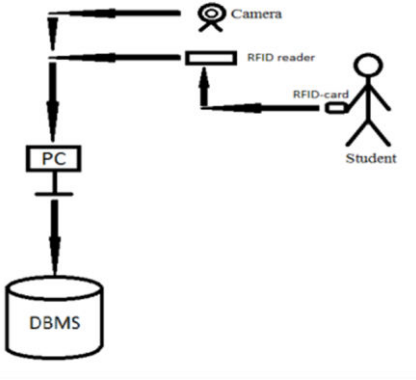
Approach: To develop a system which enables checking the students' attendance easily and efficiently;

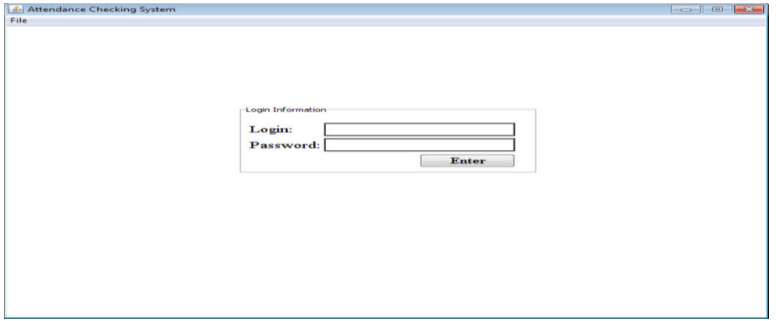
System should not be overloaded and it should not be centralized;

System should be failover for possible attacks and should work independently from the server and other programs;

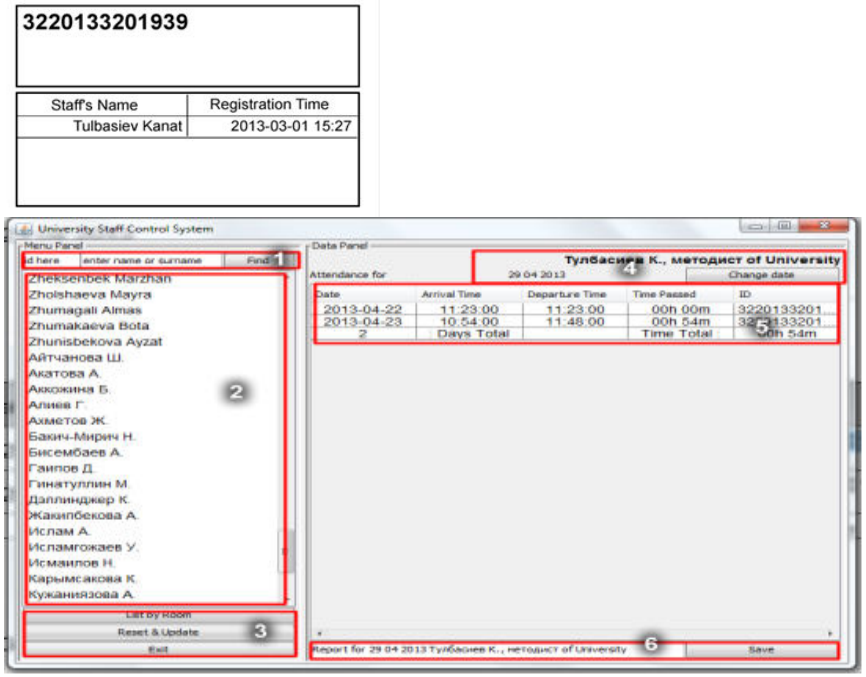
Implementation of the system should be inexpensive, because we can not invest a lot of money.







Staff Control system



Checks entrance/leaving times for any staff, control the location of any person who is registered in the system, and at the end of the month, this system prints reports about all staff based on some pre-assigned requests.

This system timestamps every swipe of this ID-card so that the system controls entrance and leave of the person. This system is capable of the following:

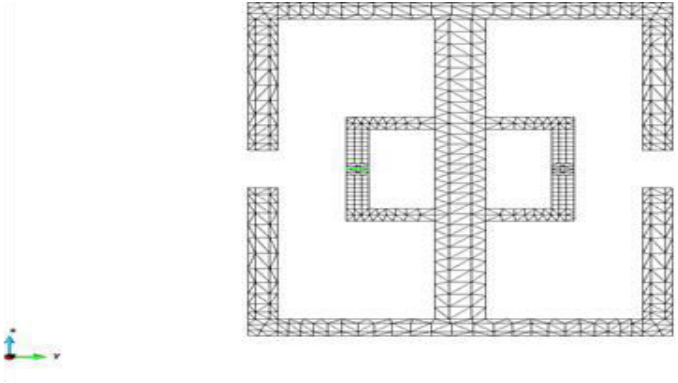
- Accurate monthly report of staff attendance;
- No paperwork for HR department, less problem;
- Reports are saved in secured .PDF format, so that at the end of each month administration will have a nice documented attendance.

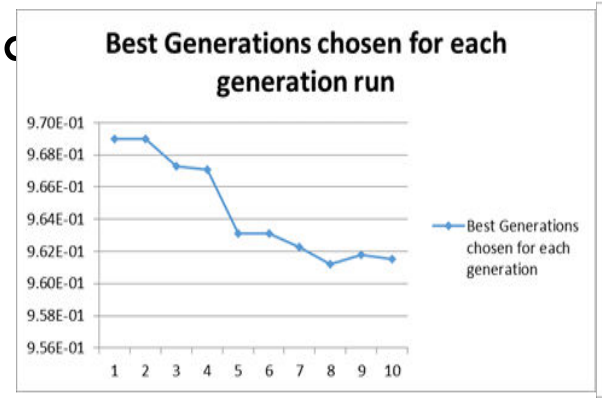
This system maintains a daily record of a person's arrival time to work and departure time from work. Aside from the records of time and date, the system features the name, position and the assigned number (so-called ID) of each personnel.

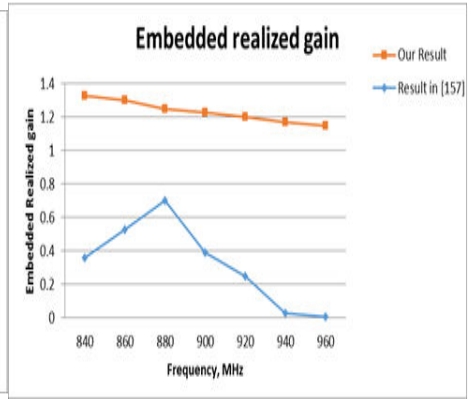
Optimization of a single-chip UHF RFID tag antenna by the means of MoM and GA

The criteria of the optimization are improvement of the reading range of the RFID grid, the gain of an antenna reduced by the losses due to the mismatch of the antenna input impedance to specified impedance, and how many power can be transmitted between the reader and the tag [0->1].

Prototype of the tag antenna for optimization:







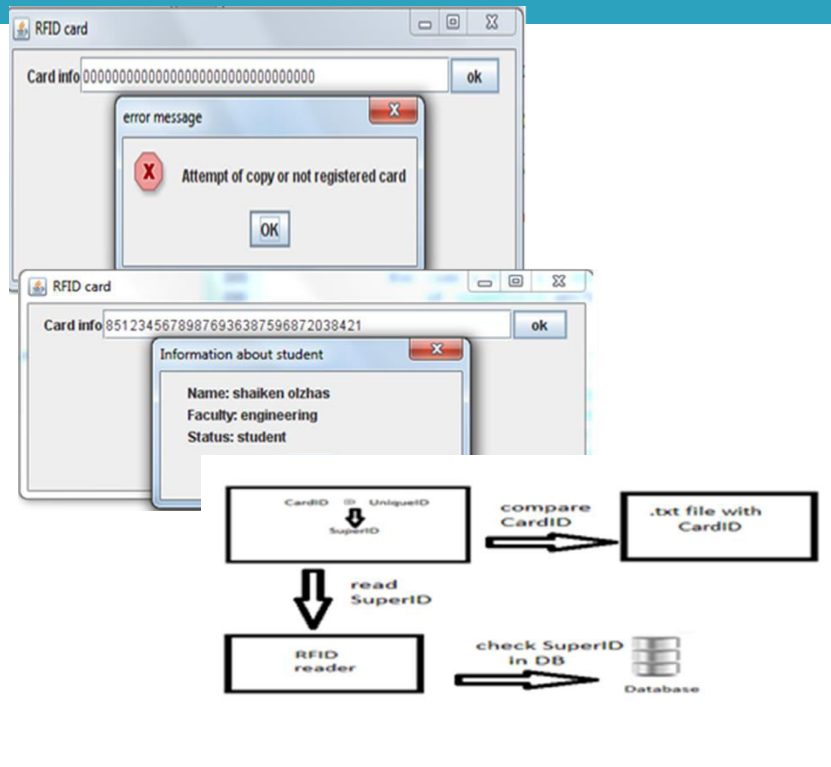
Encryption algorithm

Each RFID card has four blocks and sixteen sectors, in which data is stored. The size of each sector is 32 digits long, which means that all saved information is 32 long length. RFID-cards have their own 32 digits long so-called “CardID”, which is stored in zero block, zero sector. Beside this CardID, another so-called “UniqueID“ is created and it is 32 digits long. These two different ID’s are stored in .txt file. Then, after combining these both IDs by XOR operation for each RFID card, the new ID so-called “SuperID” is created, and the size of this SuperID is the same as previous ones- 32 digits long.

- CardID XOR UniqueID = E_{MD5}(SuperID)

The new SuperID is stored in DB, and all SuperID’s are encrypted by MD5 hash algorithm to protect the data, preventing hacker from possible threats such as reading the data, copying the SuperID, and so on.

SuperID’s are stored in zero block of first sector of RFID-cards.



Conclusion

- Now I am working on other aspects of RFID applications as well as optimization phases
- Need to know your ideas!
- Preparing some papers for upcoming conferences and ready to present them
- Also, working on mobile technologies

Questions? Comments?

- You more than welcome to ask any question!
- Your comment is fully appreciated since I need to know whether I am doing correct things!