DIABETIC RETINOPATHY CLASSIFICATION USING DEEP LEARNING MODEL

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*Abstract*:

*Checking attendance for student using RFID and application:*

* *New approaches: Can update list immediately.*

Keywords: RFID, php, RESTful web service, Java application, ESP8266, NuMaker.

# INTRODUCTION

Most educational institutions' administrators are concerned about student irregular attendance. Truancies can affect student overall academic performance. The conventional method of taking attendance by calling names or signing on paper is very time consuming and insecure, hence inefficient. Radio Frequency Identification (RFID) based attendance system is one of the solutions to address this problem. This system can be used to take attendance for student in school, college, and university. It also can be used to take attendance for workers in working places. Its ability to uniquely identify each person based on their RFID tag type of ID card make the process of taking the attendance easier, faster and secure as compared to conventional method. Students or workers only need to place their ID card on the reader and their attendance will be taken immediately. With real time clock capability of the system, attendance taken will be more accurate since the time for the attendance taken will be recorded.

Overview of the current results:

* Can send data to the server.
* Still not have application to show the result.

# SOLUTION

## Part 1

Theoretical analysis of proposed solution:

* Using RFID reade the tag.
* Using NUC 131 (NuMaker board).
* Applying MySQL to store data send from RFID
* Applying application to display data.

## Part 2

Design flow of proposed solution:

* Using RFID reader: RFID reader and tag.
* Using NUC: NUC131 to connect to create operation for system
* Evaluate Model
* Optimize Model: For Accuracy
* Implement System

RFID system:

* Using RFID reader and NUC board to control the system:
  + RFID reader: RFID PN512
  + Wi-Fi module: ESP8266
  + NUC131 to control and connect hardware.

Application system:

* Using php web service to create back-end.
* Using html and css to create front-end.
* Using php to create a web service.
* Using MySQL to store data from RFID.

# RESULT

Hardware working well, can send data from NUC to server.

Basic application to display data which is send from Hardware from MySQL server.

# CONCLUSION

Advantages:

* Using a new approach: Applying the Deep Learning model to deliver a high accuracy solution, reduce training time and resources requirements.
* System has achieved the accuracy of 71% at evaluating image dataset and 67% at testing image dataset
* After optimizing by modifying model architecture, our system increases almost 10% in overall accuracy
* Have a friendly GUI for a better user experience

Disadvantages:

* Using provided dataset leads to lack of flexibility in training and testing Deep Learning model
* Training time consuming is still immensely
* Unable to build and train Deep Learning model with GPU which can theoretically increase system performance as well as reduce time consuming

Future work:

* Extending dataset with additional retina images (especially images for DR stage 3 and 4)
* Equipping digital fundus camera for new realistic Vietnamese dataset
* Using GPU in building and training Deep Learning model
* Applying more sophisticated method to pre-prepare the dataset, especially in Object Detection phase
* Spend more effort to remove fail entries in training dataset
* Applying new Inception-v4 which should theoretically increase accuracy but also increase training time and resource usage due to higher complexity of model architecture

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