

An Efficient Security Access System for Computers using Image Processing Techniques

V.B.C. Ayyappan, P. Gouda, C. A. Origanti, S. Sreedhar, Amritha University, India

Faculty Advisors: Dr. M.Tahernezehadi and Dr. A. Azad

College of Engineering and Engineering Technology, Northern Illinois University, DeKalb, IL 60115



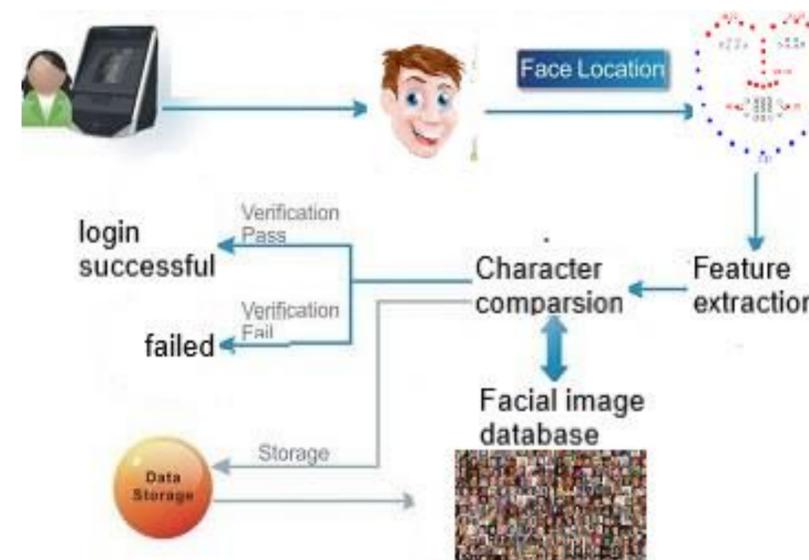
NORTHERN ILLINOIS UNIVERSITY

College of Engineering and Engineering Technology

Abstract

This project describes the method for an efficient face recognition system for access control to a computing device while utilizing image processing techniques. This unique method can be used for Windows, Linux and Unix operating systems. The proposed system detects the user's face with a 98% probability and detects the intruder's face with less than 1% probability. Additionally, the system application alerts the user when an intruder tries to unlock the system and also sends the image of the intruder's face to the user, thus assuring maximum security to the system.

Methods and Materials



Results

Graphics Card	Training and Testing Time	RAM	Detection + Unlocking Time (in sec)
2 GB	40 sec	4 GB	9+9
6 GB	20 sec	8 GB	4+4
12 GB	10 sec	16 GB	2+2

No. of Epochs	Batch Size	Learning Rate	Loss	Accuracy	MLP Error	Probability
300	50	0.01	0.16	0.936	4.95%	98.2%
500	30	0.1	0.01	0.998	14.5%	64.8%
150	50	0.01	0.38	0.62	8.23%	88.4%

Problem Statement

Till date work based on Facial recognition lock are confined to case.(i.e. Either pose or Illumination or specific set of database). Our main aim of project is to fulfill maximum number of factor in a real time application. A complete face recognition system includes face detection, face pre-processing and face recognition processes. Therefore, it is necessary to extract the face region from the face detection process and separate the face from the background pattern, which provides the basis for the subsequent extraction of the face difference features. The re facial learning detection methods, compared to the traditional method not only shorten the time, and the accuracy is effectively improved.

Discussion

If epochs are increased and the rate is decreased, there may be an increased accuracy, but dropouts in neurons will be high, overfitting the system, so the system will not be efficient. Moreover with increase in the epochs the duration of the process also increase creating a delay in detection of the face. Depending on the version of the processors and graphics card the entire duration of the process of testing and training the data also changes. In the future, by increasing the number of facial points one can increase the accuracy of the system as more vector coordinates give many efficient results.

Conclusions

The system for face recognition is created after studying various methods and analyzing them to increase the robustness and accuracy of the system. It is also integrated into the windows operating system without compromising the OS-user agreement by triggering tasks. Therefore, the system is very reliable and accurate with the results shown.

Acknowledgements

The team would like to thank Dr. Tahernezehadi and Dr. Azad for their outstanding support and feedback throughout this project.