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DESIGN AND IMPLEMENTATION OF FACE RECOGNITION SYSTEM

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Abstract Facial recognition is a technique of verifying an identity using face. This can be used to identify people in photos, videos or in-real. Through this project, a very basic form of face recognition has been implemented using the Gabor Filter, Hausdorff Distance, SVM, SURF etc. techniques/approaches. MATLAB tools have been used for derivation.

Keywords- Gabor Filter, Hausdorff Distance, SVM, SURF

1. INTRODUCTION

In the continuous evolving technologies, Face recognition has become an important aspect of system automation. This has backed up the edge on new generation security solutions. Facial recognition is a category of biometric security. The technology is mostly used for security and law enforcement, though there is increasing interest in other areas of use. Face recognition is an interesting and challenging problem and impacts important applications in many areas such as identification for law enforcement, authentication for banking and security system access, and personal identification among others.

II. RELATED WORK

The main motive of present work is to develop new face recognition systems which enhance the performance and reduce the computation of system. A new face recognition system, using Gabor filter, hausdorff distance, SVM and SURF. Gabor filter and hausdorff distance are used for feature extraction, calculation.
This research entitle the ready to use a roboust, efficient high performance Face recognition system for any web, windows, on-cloud apps as a security step in the login and verification process.

III. TECHNOLOGIES USED

MATLAB -tools have been used for high- performance language for technical computing along with Object oriented programming and sophisticated data structure.
SQL Server - has been used to maintain RDBMS database.
MATLAB graphics system- It includes high-level commands for two- dimensional and three-dimensional data visualization, image processing, animation, and presentation graphics. Algorithm — SVM, Haar wavelets.

IV. IDENTIFY, RESEARCH AND COLLECT IDEA

There are several steps we can take to identify, research, and collect ideas for a face recognition project using KNN and OpenCV:

Identify the problem or challenge I am trying to solve:
Clear problem definition, this helped me to focus my research and ensure the ideas are relevant and meaningful for this research.
Research existing approaches and techniques: Once I defined the problem, I started researching existing solutions available so far. Source was academic papers and articles, reviewing existing 3rd party software, architectures, and searching online for relevant resources and examples.

Collect ideas and potential solutions: As I research existing approaches and techniques, make a list of potential ideas and solutions that we think might be relevant and useful for our project. This can include specific algorithms or techniques, as well as potential tools and frameworks that we might use to implement our solution.

Evaluate and prioritize the ideas: among all possible and potential ideas/solutionsI evaluated and prioritize them based on their feasibility, efficiency and other accuracy. This helped me to identify the most efficient and relevant ideas to pursue further in my project.

Overall, identifying, researching, and collecting ideas for a face recognition project using Gabor filter, SVM, SURF along with MATLAB tools is an efficient but continuous learning and exploration paradigm , it promis to be a primary choice to find the best solution for our specific needs and goals.

V. GET PEER REVIEWED

Share our work with colleagues or peers: simply share our work with colleagues or peers who are interested in face recognition or related topics. This can be a more informal way to get feedback and review, but can still be valuable in helping us improve and refine our work.

VI. IMPROVEMENTS AS PER REVIEW COMMENTS

To improve our face recognition design and implementation using peer comments, here are a few key points:

Fast indexing for matching: To speed up matching step, the sign of the Laplacian (i.e, the trace of the Hessian matrix) for the interest point is used. Use of approximated DoG (Difference of Gaussian) and the integral image trick.

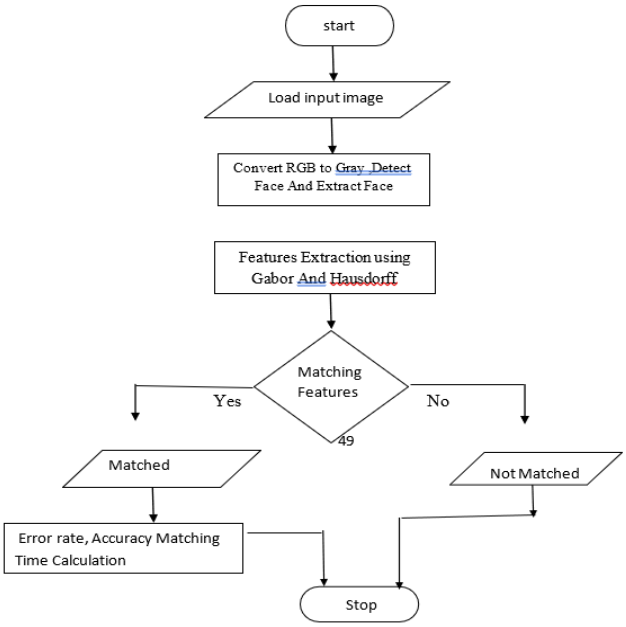
Suggestions or critiques from my peers are most important to improve the efficiency anc accuracy of this system as I have missed some aspects of this design and implementation

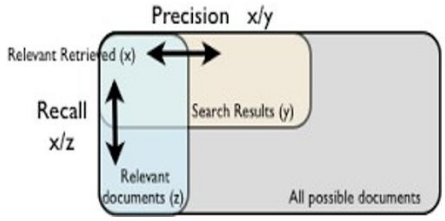
Through testing this system with a broad range of images to ensure that it is accurate, robust and is reliable system from different angles, lighting conditions, and facial expressions.

Consideration for betterment:- I have planned to implement some more design ideas and tools to improve the accuracy of our face recognition system. i.e. usage of deep learning techniques such as convolutional neural networks (CNNs). Hosting the system in cloud (Azure) and leverage Azure data factory for roboust data management. CosmosDB a NoSQL can be introduced for faster data manipulation.

Being open to new approaches or techniques, Face recognition can be implemented in many different ways. By continuously experimenting and learning, you can improve the performance of our face recognition system.

VII. MODELS





VIII. CONCLUSION

Face detection has been an attractive field of research for both neuroscientists and computer vision scientists. We suggest a quick method for identifying and locating faces using Hausdorff distance along with SURF and SVM. This method is used to get better results in terms of error rate, matching time, and average accuracy. The goal of this research is to identify faces from a single photograph. Future consideration may include more and other criteria. Additionally, new methods can be used to speed up face detection and reduce execution time. The thesis's proposed algorithm can be used with a variety of tools.

REFERENCES

[1] A. Jain, R. Duin, and J. Mao , "Statistical Pattern Recognition: A Review", IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 22, 1, pp.4–37, January 2000

[2] Aliex M. Martinez and Avinash C. Kak, "PCA vs LDA", IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 23, 2, Febuary 2001.

[3] A. Bayesian, and C.H. Liu, "Face Recognition using Gabor Filters", World Academy of Science Engineering and Technology Vol.28, pp 51-56, 2007

[4] Al-Amin Bhuiyan, and Chang Hong Liu, " Face Recognition using Gabor Filters", International Journal of Information and Communication Engineering Vol.4,3, 2008

