Convolutional Neural Network Approach for Bimodal Biometric Identification System

Aditi Sangle
Zeal Punamiya
Soumyojyoti Dutta
Vedang Gore
Guide- Prof. Sachin Malave

A.P. SHAH INSTITUTE OF TECHNOLOGY
PARSHVANATH CHARITABLE TRUST

Computer Engineering

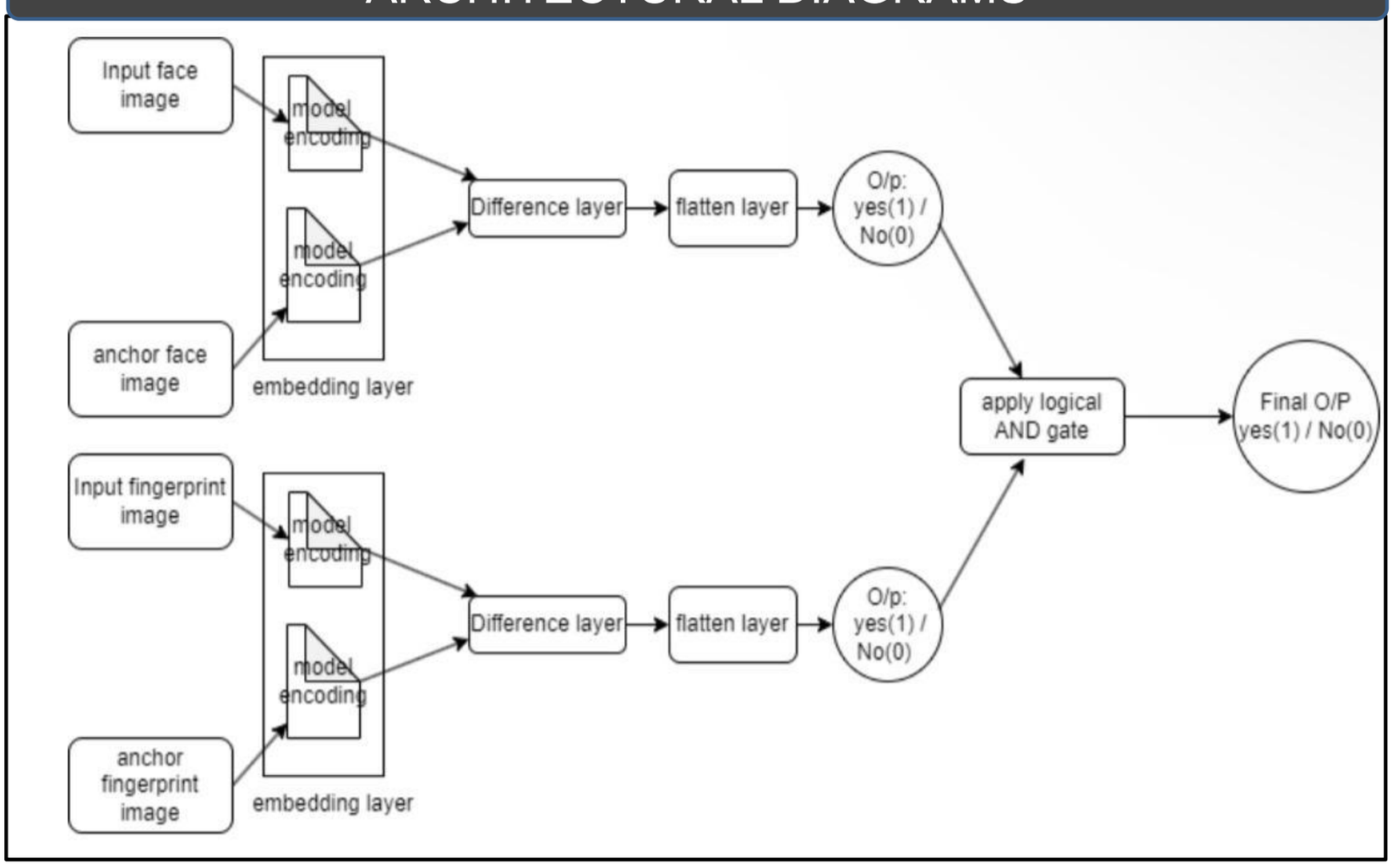
ABSTRACT

Sometimes the process of machine learning is found to be difficult for analysing and computing the desired result. This generally happens when the dataset is relatively small.We have considered taking images for faces as well as fingerprints. This is keenly effective security wise and training wise too. We focus on working on the learning ability of the Siamese neural network which use a special structure to prioritize input similarity. When the training is done, the model then has the ability to extend its prediction qualities not only to new classes, but also to unknown distribution sets as well. The base being a convolutional architecture, we are therefore able to get a much higher and stronger results in comparison to other deep neural networks.

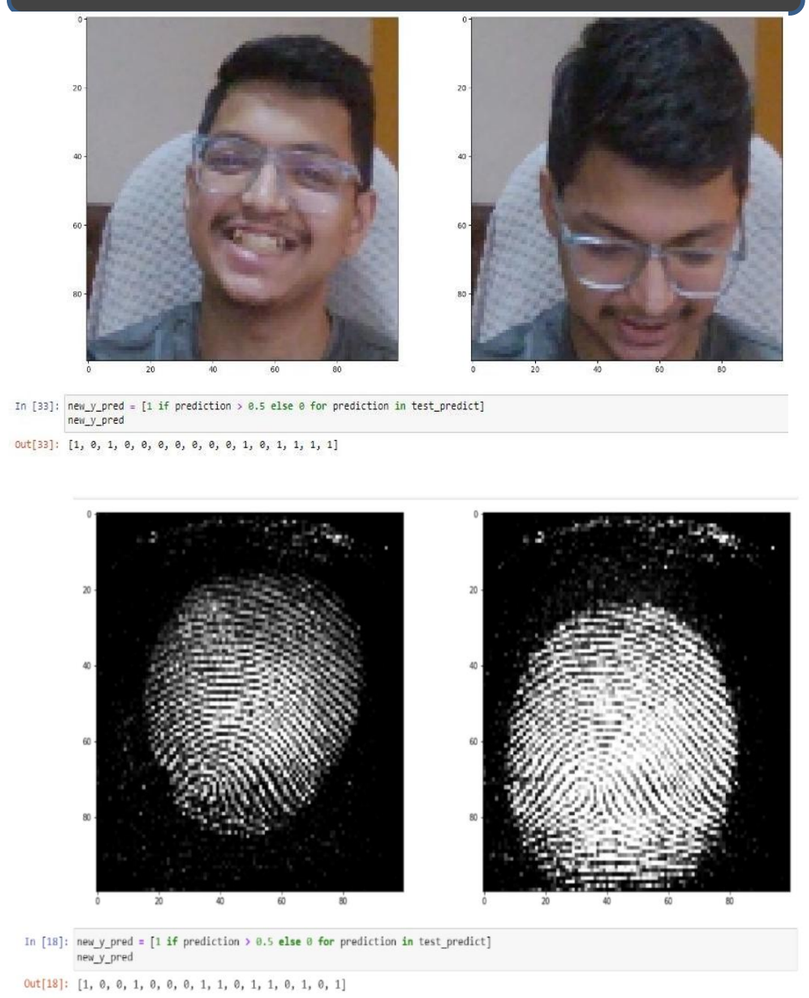
OBJECTIVES

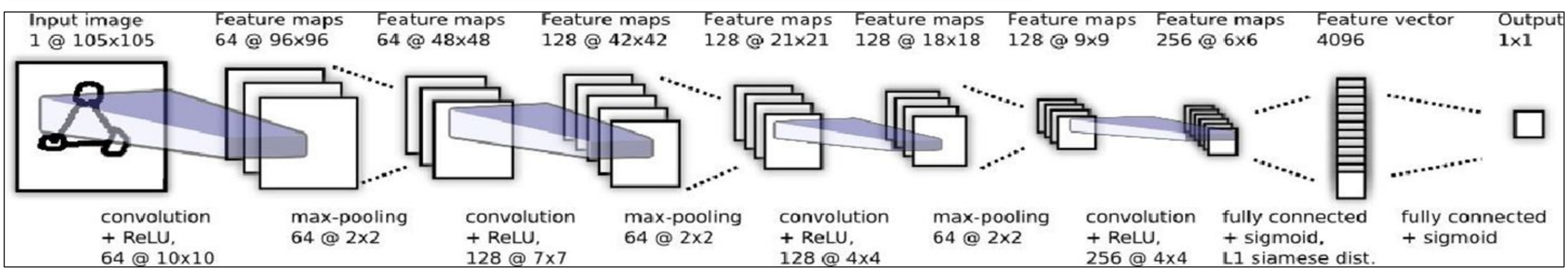
- To offer an accurate matching compared with other system based on bimodal characteristics.
- To evaluate new images, in a pairwise manner against the test image
- To create an inexpensive, reliable option towards a passwordless future.

ARCHITECTURAL DIAGRAMS



RESULTS





CONCLUSION

We have presented a strategy for performing biometric identification by first learning deep convolutional siamese neural networks for verification. Our networks outperform all available baselines by a significant margin and come close to the best numbers ever achieved. The strong performance of these networks on this task indicate that human-level accuracy is possible with our metric learning approach.Also this approach should extend to tasks in other biometric domains.

REFERENCES

[1] Cherrat EM, Alaoui R, Bouzahir H, Jenkal W. 2017. High-density salt-and-pepper noise suppression using adaptive dual threshold decision based algorithm in fingerprint images. In: 2017 Intelligent Systems and Computer Vision (ISCV). Fez: IEEE, 1–4.

[2] Mane S, Shah G. 2019. Facial recognition, expression recognition, and gender identification. In: Balas V, Sharma N, Chakrabarti A, eds. Data Management, Analytics and Innovation. Singapore: Springer, 275–290.