



UNIVERSITY OF ENGINEERING &
MANAGEMENT KOLKATA

DEEP CONVOLUTION NEURAL NETWORKS FOR BINARY **CLASSIFICATION OF MASKED FACE IMAGES USING SVM AND TRANSFER LEARNING**

INNOVATIVE PROJECT-I

GROUP 45

Subham Das
Shreyon Sinha
Vishal Kumar
Aniket Nayek
Naiwriti Mullick
Abhishek Das

UNDER THE GUIDANCE OF

Prof. Dr. Maumita Chakraborty

Project Guide
HOD, Department of Computer
Science and Technology
UEM, Kolkata

Prof. Prasenjit Kumar Das

Project Guide and Assistant
Professor
Department of Computer Science
and Technology
UEM, Kolkata

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WHAT WE'LL COVER IN THIS SESSION

- Problem Definition
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PROBLEM DEFINITION

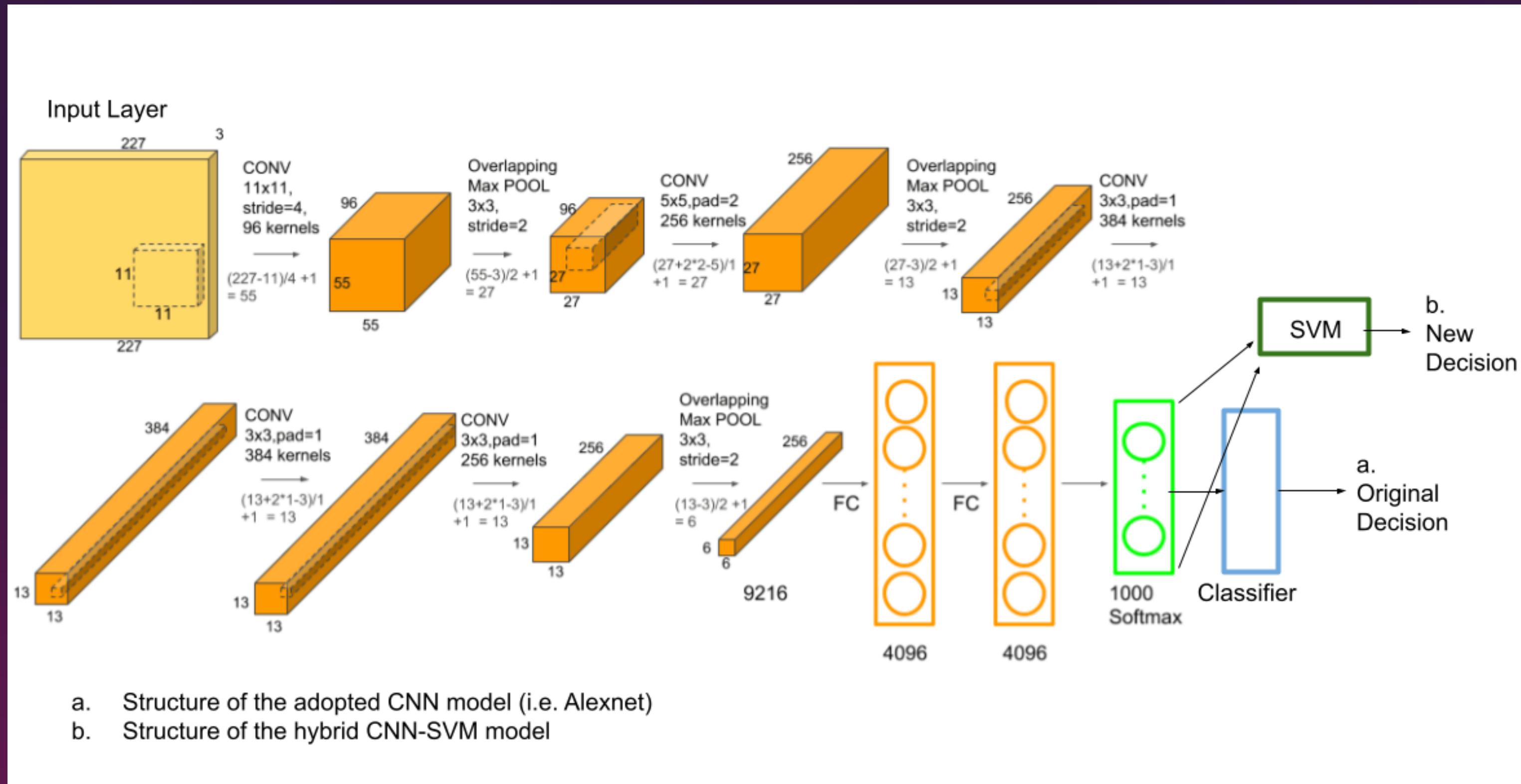
In this project, we will try to improve the accuracy score of Real-World Masked Face (RMFD)

Redesign a supervised deep convolution neural network for the classification of masked faces.

Improve the accuracy of the prediction using some transfer learning from “Alexnet”

Use the SVM algorithm to complement the network model

EXPLANATION OF ALGORITHM



RESULT ANALYSIS

- The highest accuracy achieved is 98.54%. Further with this setup, the hybrid CNN-SVM learning classifier produced an error of 1.45% on the training dataset and 1.1% on the testing dataset.
- There are 47 misclassified samples, because for the following reason-
 - (i) Few images in the dataset are not properly captured, as it is cropped badly.
 - (ii) Some images are too blurred to extract proper features.

Performance	Alexnet-CNN	Hybrid CNN-SVM
Training	97.20%	98.54%
Testing	97.72%	98.89%

Confusion Matrix		
	Mask	NoMask
Mask	1667 51.5%	19 0.6%
NoMask	28 0.9%	1525 47.1%
	98.3% 1.7%	98.8% 1.2%
Mask		98.5% 1.5%
NoMask		

FUTURE PROSPECTS

THERE IS VAST SCOPE FOR FUTURE DEVELOPMENT OF THIS PROJECT

- performance of the hybrid model can be further improved through the fine-tuning of its structure and its parameters
- for example, improvements might be made based on the size of the input layer
- further study that how to improve the model for face detections over a mask
- can try this model on peoples of different countries and cultures for a generalization

Conclusion



The hybrid model have designed to recognize masked faces, which first uses Alexnet-CNN which works as an automatic feature extractor and then the feature were passed through SVM for final output



The efficiency & feasibility of the model were evaluated by the recognition accuracy, which is 97.54% in our case.



It has achieved the lowest error of 2.8%.



The model combines the advantage of both SVM & Alexnet-CNN, the two most successful classifiers.



But the Complexity of the model in the decision process increases a little bit when compared with other CNN classification models.

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Thank you!

Any questions?