PROJECT KOJAC SUMMARY
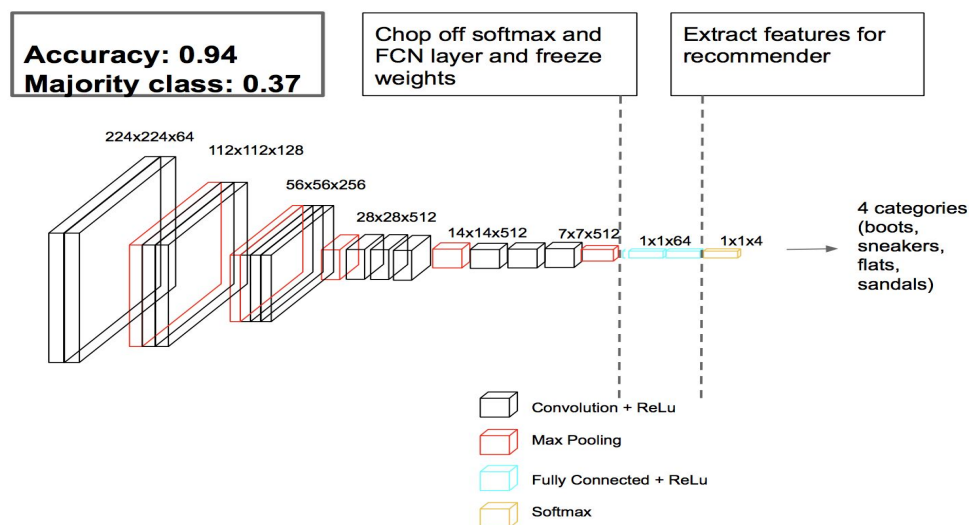# SHOE RECOMMENDER

-Hiranya Krishna Kumar

DESCRIPTION

In Project Kojak I web-scraped over 10,000 images in four categories of shoes from Shoes.com and collected designer shoe images from NET-A-PORTER.com .I used convolutional neural networks to first classify the category of the shoe and then made a style match to give a recommendation of 3 similar and affordable shoes.

METHODS

The RGB images collected were resized to 2224x224x3 and converted to numpy arrays using scikit image library. The VGG16, RESNET50 and VGG19 models, pretrained on the IMAGENET dataset were tested.The top 3 layers of all the CNN's were removed and replaced with 2 dense layers of 64 neurons each and a softmax layer with 4 classes. ADAM was the best optimiser(other's tries were Adagrad, SGD and RMSprop and categorical cross entropy method was used to calculate loss.The input for the recommender was the output of the dense layer with 64 features for each shoe. Cosine similarity , Euclidean distance and Manhattan distance were used to calculate the similarity between images . The best distance metric was cosine similarity. All the models were trained on AWS. The VGG 16 model was the best model with a validation accuracy of 0.94 for a majority class of 0.37. All models were trained for 15-20 epochs with early stopping (patience=3 epochs and metric=validation accuracy) and callbacks to monitor the loss and accuracy throughout all the epochs. The model was trained to retain the weights with the best validation accuracy. Cosine similarity was applied on the output of the VGG16 dense layer with 64 features recommend 3 most similar images to a test image.
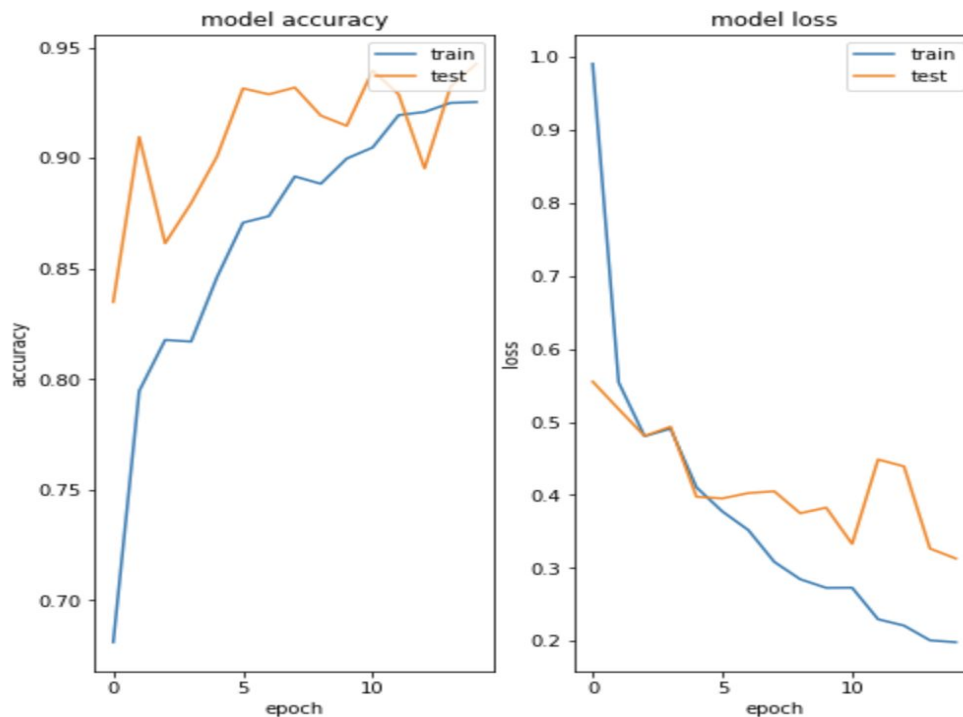
TRANSFER LEARNING -VGG16 ARCHITECTURE

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RESULTS

	RESNET50	VGG19	VGG16
VAL-LOSS	0.32	0.84	0.54
ACCURACY (TRAIN)	0.92	0.94	0.96
ACCURACY (TEST)	0.94	0.94	0.94

WEB APP
A web app for shoe recommendation was built using Flask ,HTML and CSS

FUTURE WORK

- ❖ Add text features (NLP) to further improve the recommendation
- ❖ Use semantic segmentation to identify type of clothing/accessory/shoe
- ❖ Add more images to train the model and more categories

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