Identifying Lead Cast In Movies Using Transfer Learning Models

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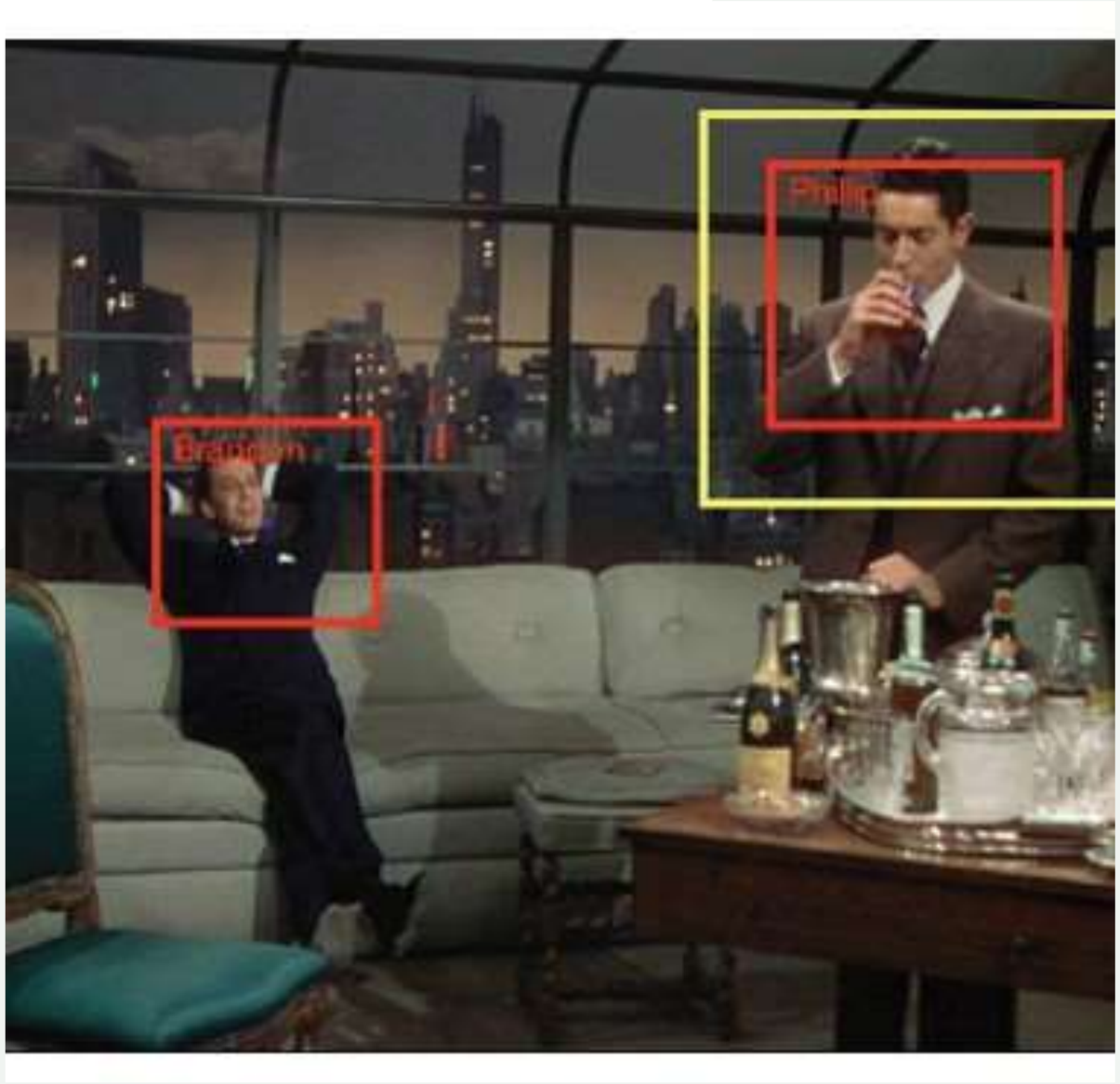
Objective

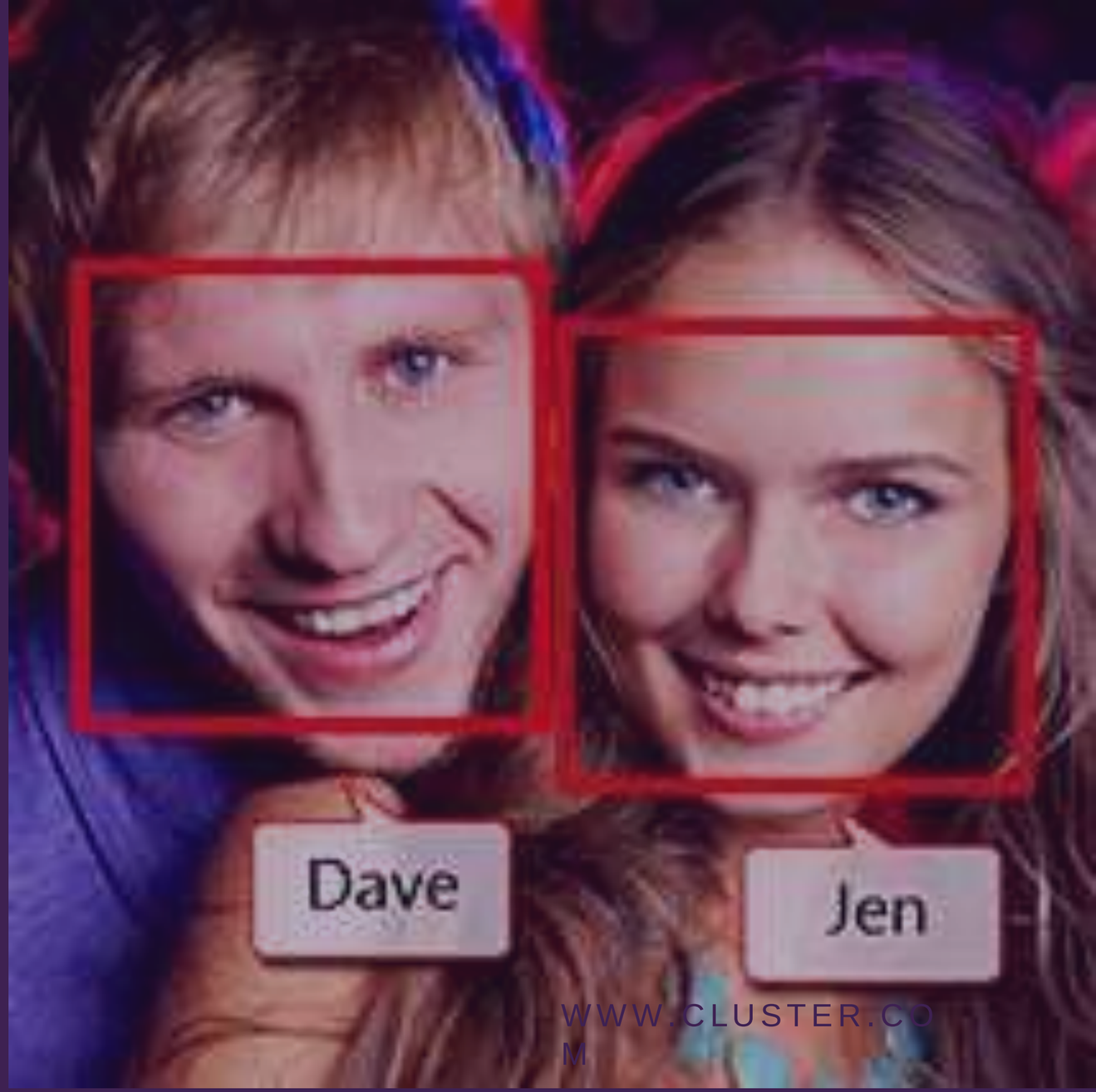
Detecting and naming actors in movies are important for content-based indexing and retrieval of movie scenes and can also be used to support statistical analysis of the film style.

Detecting and naming actors in unedited footage can be useful for post-production.



MOTIVATION

Recognizing human faces in wild is emerging as a critically important and technically challenging computer vision problem. With a few notable exceptions, most previous works in the last several decades have focused on recognizing faces captured in a laboratory setting. However, with the introduction of databases, face recognition community is gradually shifting its focus on much more challenging unconstrained settings.



Technology Used

- Python
- Tensorflow
- Transfer Learning
- OpenCV

How we made it

1. We applied Transfer Learning models of Tensorflow to cut down the computation power required.

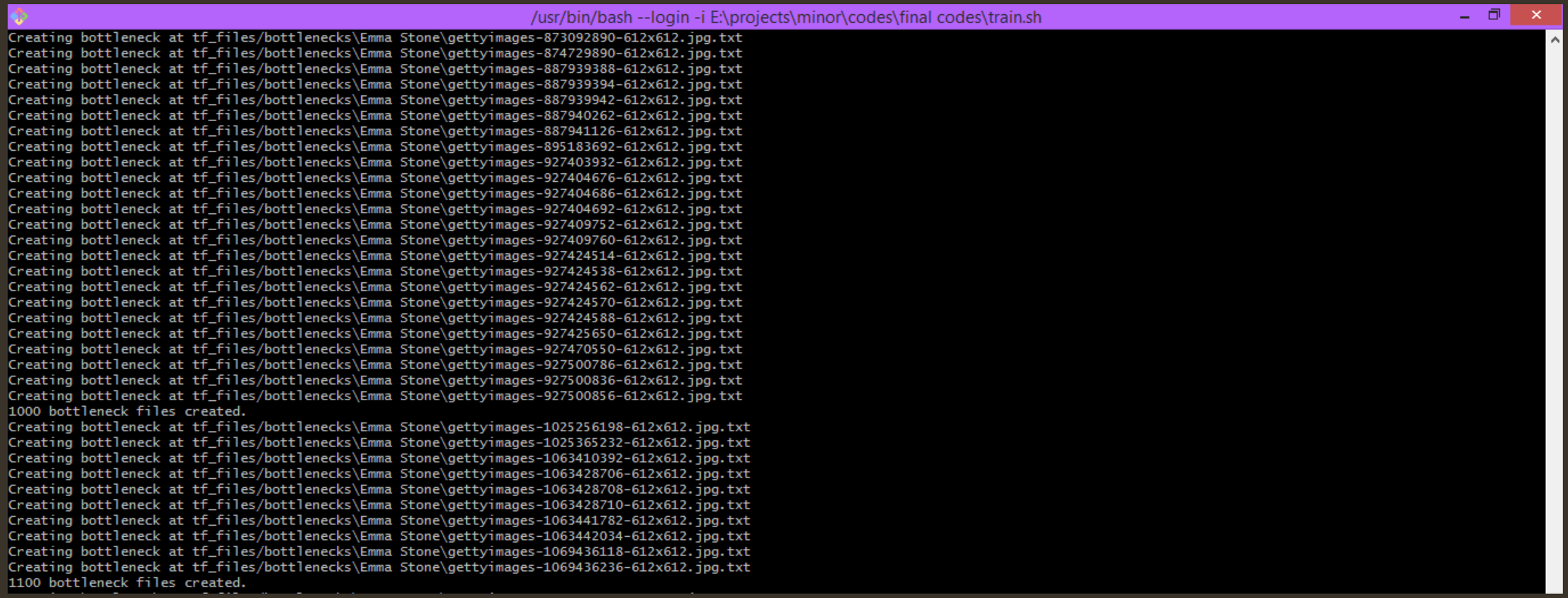
2. We firstly pruned the dataset, deleting those image that doesn’t contain a recognizable human face then train the dataset of actors/actress using the ImageNet model.

3. When training is done we had then input the film and extracted the frames every 36 seconds. After extracting is done we had again applied face detection to delete those image that either doesn’t have a face or have blurry face.

4. After all the pruning work is done we had applied our Tensorflow model.

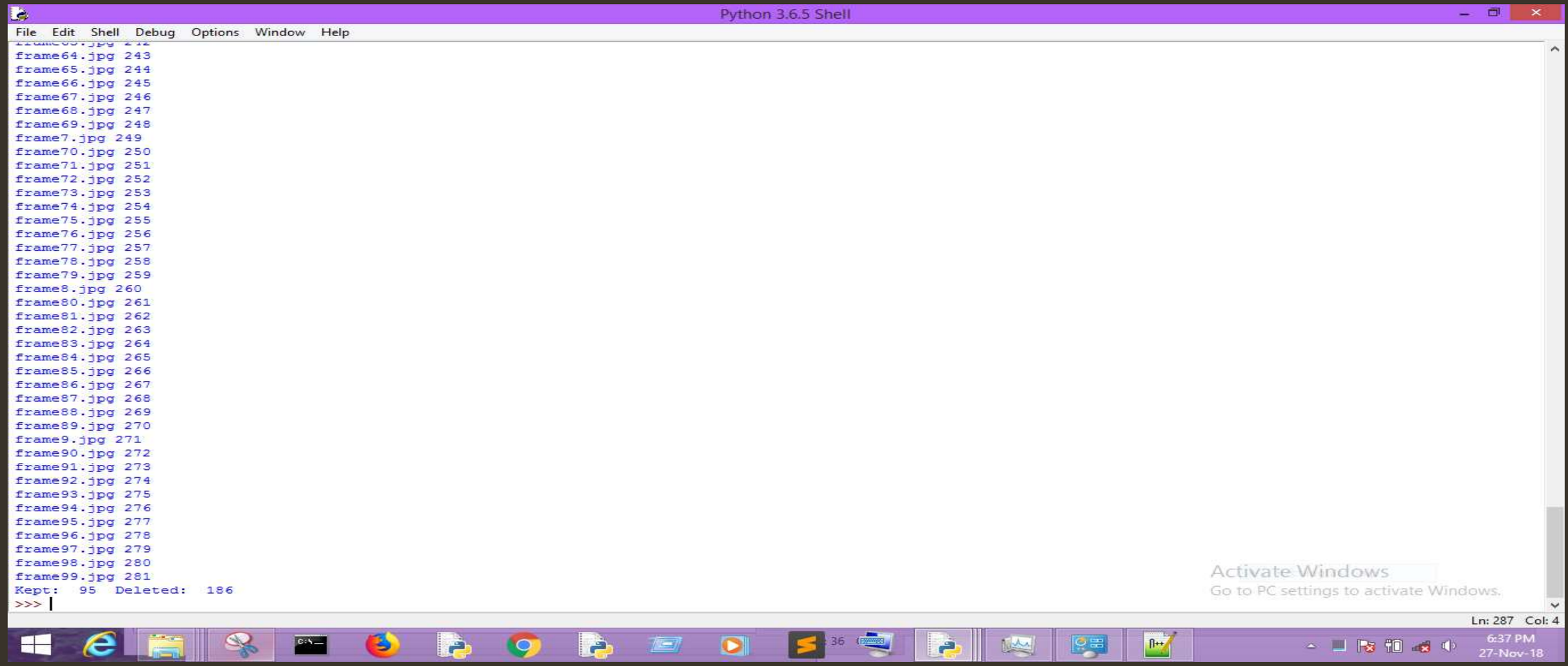
Screenshots

During Training: Creating Bottlenecks



Screenshots

Removing No Face/ Blurry images

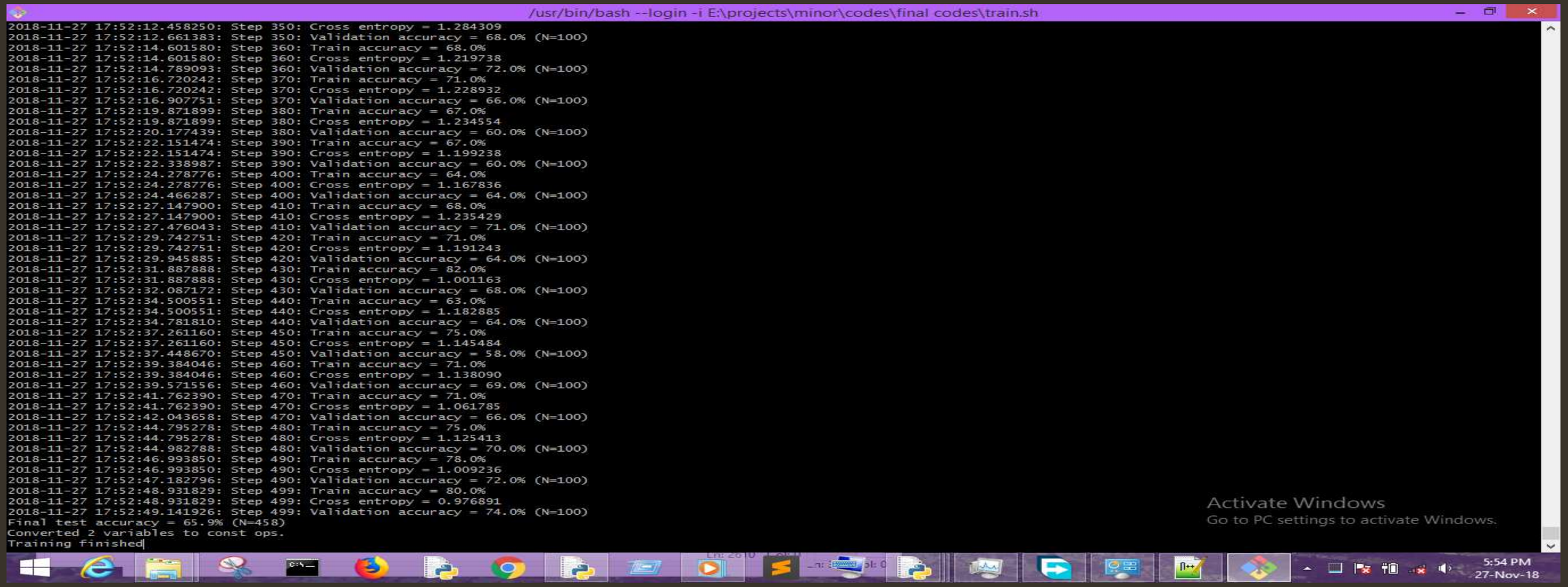


Screenshots

Training and Testing Accuracy

Training Accuracy: 80.00%
Validation Accuracy: 74.00%

Cross-Entropy: 0.1953
Final Test Accuracy: 65.9%



Screenshots

Final Result (Input Film: Love and other drugs)

Leading Male Cast: Ryan Reynolds (error)
Leading female cast: Anne Hathaway (correct)

Correct Male Leading Cast: Jake Gyllenhaal
Correct Female Leading Cast: Anne Hathaway

Python 3.6.5 Shell

File Edit Shell Debug Options Window Help

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Leading male cast: ryan renolds : 26.105941993466793
Leading female cast: anne hathaway : 22.939529001722953
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Ln: 85 Col: 57

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Results and Accuracy Metrics

Input Film: Love And Other Drugs
Correct Leading Cast: Jake Gyllenhaal and Anne Hathaway

Output:
Training Accuracy: 80.00%
Validation Accuracy: 74.00%
Final Test Accuracy: 65.9%
Cross-Entropy: 0.1953
Leading Cast: Ryan Reynolds and Anne Hathaway

Future Use

1. Chinese Social Credit System (in effect from 2020)
https://en.wikipedia.org/wiki/Social_Credit_System

2. Dubai Happiness rating system (proposed)
https://www.theguardian.com/cities/2016/mar/16/world-happiest-city-dubai-happiness-index-report

CONCLUSION

We have presented our results based on Transfer Learning models for detecting and naming actors in movies that can be learned from a small number of training examples. Results show significant increase in coverage (recall) for actor detection maintaining high precision.

We also plan to investigate weakly supervised methods by extracting actor labels

Thank You