DEPARTMENT OF INFORMATION ENGINEERING
UNIVERSITY OF PADOVA

DIGITAL FORENSICS

Final Project:
Face Detection for videos

Giovanni Gallinaro

ID: 1210127

Face Detection For Videos

DEPARTMENT OF INFORMATION ENGINEERING
UNIVERSITY OF PADOVA

OBJECTIVES:

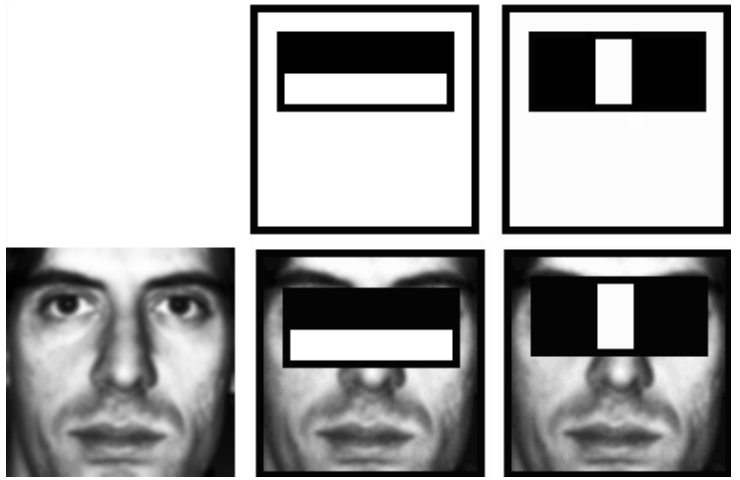
- Build a Face Detection algorithm for videos
- Maximize the accuracy

STRUCTURE OF THE PRESENTATION:

- Introduction to Face Detection through CNNs
- Technical approach to the problem
- Discussion of the results

Dataset

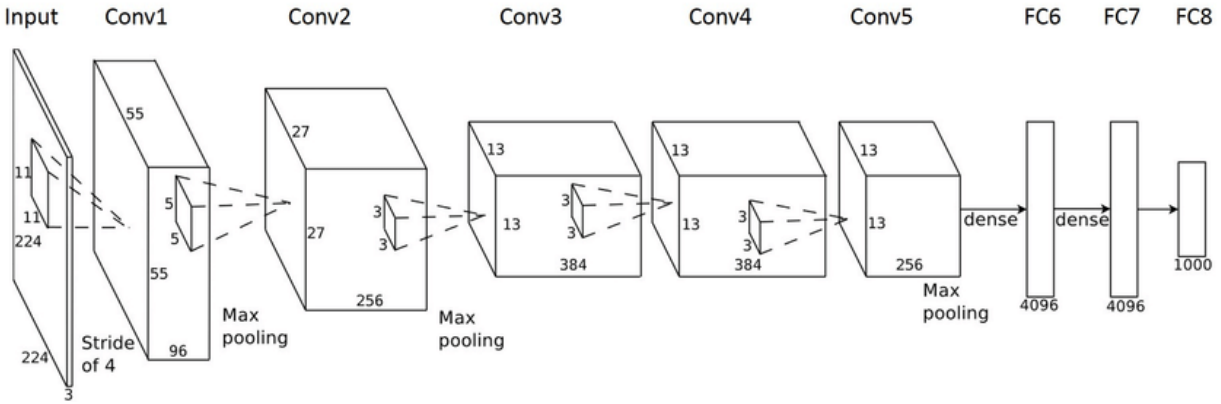
- Need large database
- Use of Cascade Classifiers
- Perform data augmentation



Deep Learning

DEPARTMENT OF INFORMATION ENGINEERING
UNIVERSITY OF PADOVA

- Divide into training, validation and test sets
- Train a CNN
  - Standard CNN
  - AlexNet
- Test accuracy on test set

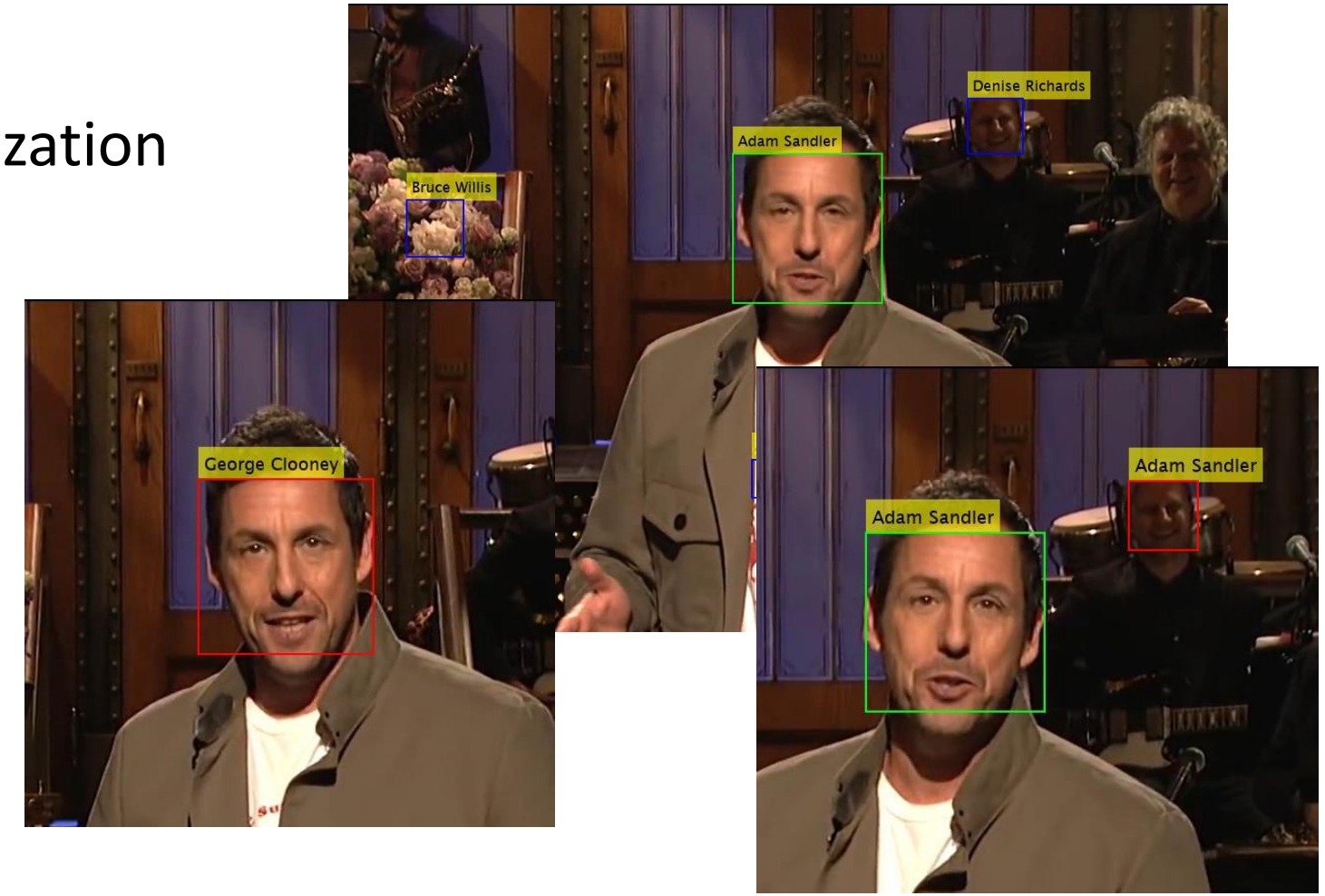


Face Detection in videos

DEPARTMENT OF INFORMATION ENGINEERING
UNIVERSITY OF PADOVA

PROBLEMS OCCURRED:

- False positives in face localization
- Network misclassifications
- No faces detected



	CNN	AlexNet
cropface	54.41	91.05
detectFaceParts	89.33	94.02

Table 1: Accuracies (in %).

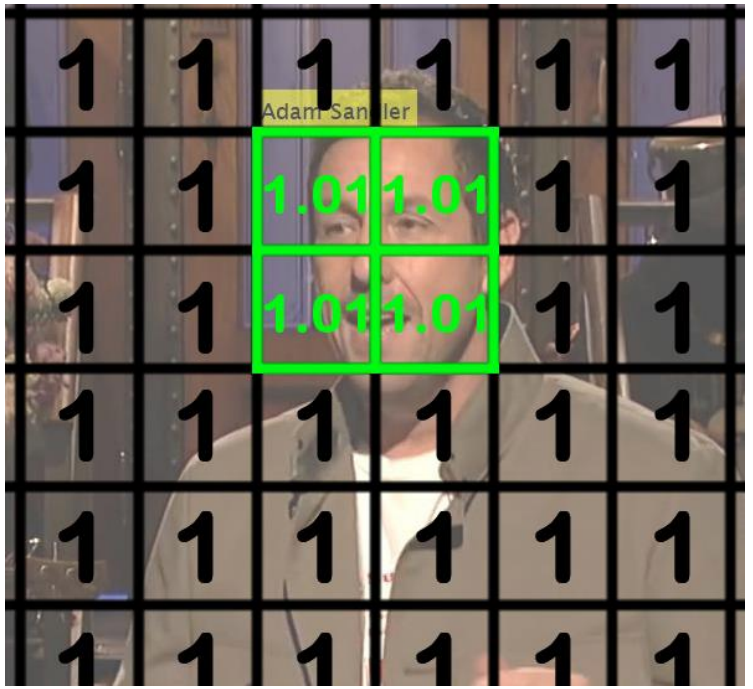
Optimization

DEPARTMENT OF INFORMATION ENGINEERING
UNIVERSITY OF PADOVA

- Improve face localization and classification
- Update a matrix of weights by a rate r
- Solve uncertainties

	Sandler	Milano	Willis	Richards	**Clooney**	Paltrow
without weights	**0.2686**	0.0896	0.1869	0.0788	**0.2901**	0.0857
with weights	**0.3878**	0.0896	0.1869	0.0788	**0.2901**	0.0857

Table 2: Scores



$$\frac{\sum W where(W \cap A)}{size(A)}$$

Results

DEPARTMENT OF INFORMATION ENGINEERING
UNIVERSITY OF PADOVA

Much better results…

… but parameters must be chosen wisely!

	CNN	AlexNet
cropface	54.41 ⇒ 96.69	91.05 ⇒ 98.89
detectFaceParts	89.33 ⇒ 94.42	94.02 ⇒ 95.22

Table 3: New accuracies (in %).

DEPARTMENT OF INFORMATION ENGINEERING
UNIVERSITY OF PADOVA

Thank you for your attention