



Machine Learning & Computer Vision

Accueil ► MAM - Mathématiques Appliquées et Modélisation ► MAM4 ► MLCVMAM4

NAVIGATION



Accueil

■ Tableau de bord

Pages du site

Cours actuel

MLCVMAM4

Participants

Badges

Généralités

Lectures

Project Repository

Semester Project

Project

Section 9

What others have done
using OpenCV and
similar alg...

Section 13

Sujet de l'examen de
MAM 4

Mes cours

ADMINISTRATION



Administration du cours

RECHERCHE FORUMS



Valider

Recherche avancée ?

DERNIÈRES NOUVELLES



(Aucune brève n'a encore été
publiée)

ÉVÉNEMENTS À VENIR



Aucun événement à venir

Aller au calendrier...

Nouvel événement...

ACTIVITÉ RÉCENTE



Nouveaux messages (1)
Activité depuis le dimanche 25
Vers les messages Ignorer
août 2019, 11:33

Me désinscrire de
Français (fr) ▾
MLCVMAM4

Rapport complet des ac
Francoise Baude
récentes... ▾

Aucune activité récente

ACTIVITÉS



-  Devoirs
-  Forums
-  Ressources

 News forum

 Forum informel

 Podcast "Le cerveau a-t-il un sexe ?"

Podcast

Le cerveau a-t-il un sexe ?

<http://www.franceculture.fr/emission-continent-sciences-le-cerveau-a-t-il-un-sexe-2012-11-12>

 Les filles sont elles vraiment nulles en math ?

Les filles sont elles vraiment nulles en math ?

Une présentation de plusieurs études scientifiques majeures pour répondre définitivement à cette question. Cette page complète le podcast précédent

Lectures

PDF of the Lectures

 Context & Vocabulary

Nouveaux messages (1)
Vers les messages Ignorer



Boosting



Histograms & CAMShift



Artificial Neural Networks



Convolutional Neural Networks

Style Transfer & Deconvolution & Adversarial
Examples & Biases

Video representation & Analysis



Optimization (TIPS TRICKS)

Project Repository



1st Project Submission

Your first project submission must contain:

- Readme.txt (explications on the work done)
- facedetect.py

Your code file must be:

- cleaned-up of useless portions
- commented (both for the existing code and the code you have added)
- improved: the face detection must be done in the neighborhood of the face detect location in the previous frame and not in the full frame
- Well written, modular, robust,



2nd Project Submission

Your second project submission must contain at least 2 files:

- Readme.txt (explications on the work done)

Nouveaux messages (1)
Vers les messages Ignorer



- facedetect.py

Your code file must be:

- cleaned-up of useless portions
- commented (both for the existing code and the code you have added)
- improved: It has to follow the hand and store in a file the squared zone around the hand.
- Well written, modular, robust,



3rd Submission

This 3rd submission is MANDATORY and must present a code that provides real-time prediction of letters by integrating a trained network into the facedetect.py code.

As always, we expect a code cleaned, commented and accompanied by a readme that explains what you have done.



4th Submission

This 4th submission must present a code that:

- extracts the features from the pre-trained VGG16 model to train a MLP
- provides real-time prediction of letters by integrating the trained MLP into the facedetect.py code.

As always, we expect a code cleaned, commented and accompanied by a readme that explains what you have done.

Semester Project

Nouveaux messages (1)
Vers les messages Ignorer

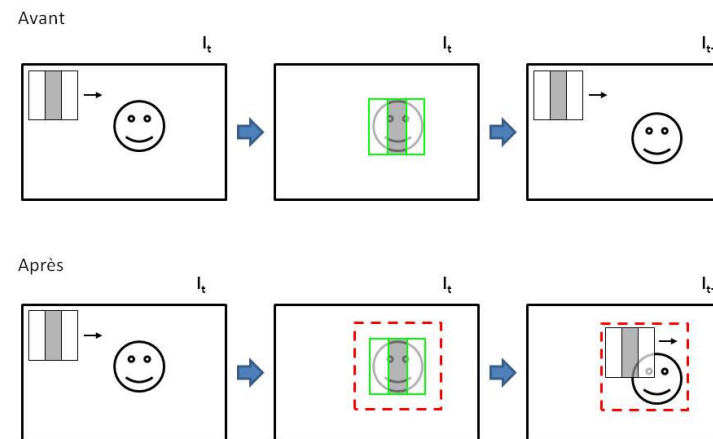


```
pip3 install opencv-python
```

```
pip3 install opencv-contrib-python
```

Then download the whole opencv repo: <https://github.com/opencv/opencv/>

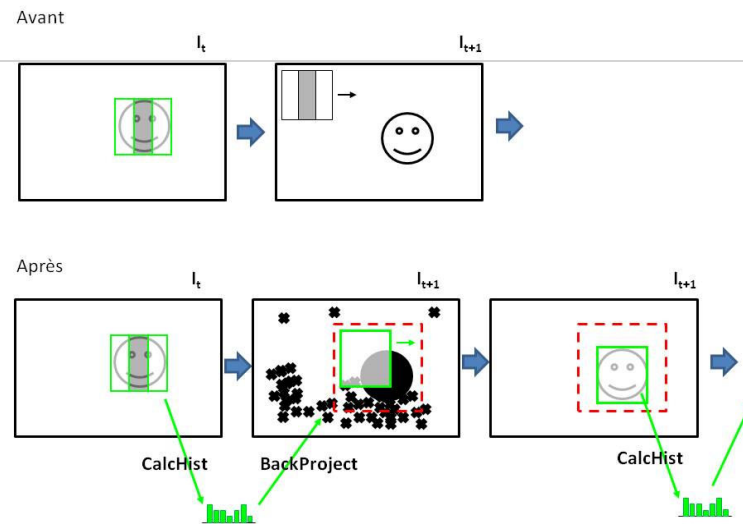
. 1st Lab: We start by trying to reduce the computation time of the example FaceDetect



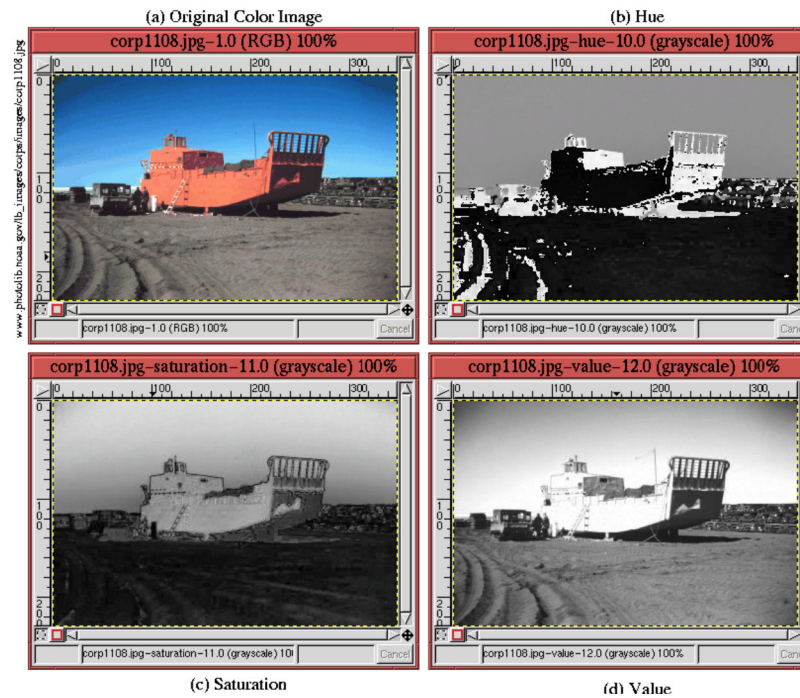
Project

. Practical Session 2: CamShift integrated with FaceDetect

Nouveaux messages (1)
Vers les messages Ignorer

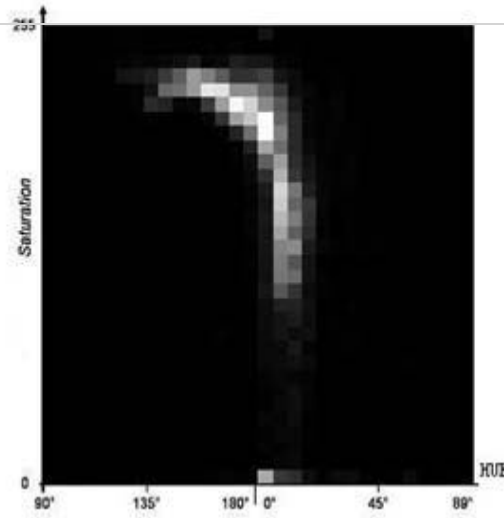


Be careful, the color space HSV is not the color space RGB. When we compute histogram on H, we consider only a very restricted part of color information:



We can, **if required**, improve skin recognition by substituting in the code of your camshift, the computation of your histogram on H from color space HSV (<http://elle.epfl.ch/net/gimp/BOOK/fr>)

Nouveaux messages (1)
Vers les messages Ignorer

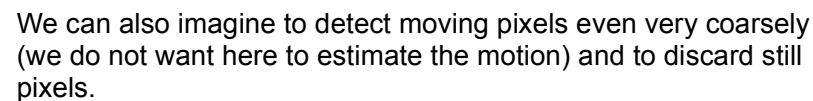
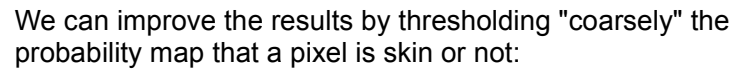


For this, copy-paste the code given as example of **CalcHist** in the manual *opencv2refman.pdf*.

Get the histogram computed to give it back to BackProject. Be careful, the histogram is now 2D, you may have to modify the code so that BackProject accept it as a parameter.

- **Practical session 3: Modifying CamShift code to track the hand and extract its probabilistic mask from the video**

Nouveaux messages (1)
Vers les messages Ignorer



- **Practical session 4: We give hand training samples to a Multi-Layer**

8 of 17



We start by testing the code ***letter_recog.cpp*** on the database letter-recognition.data (given by the following links letter-recognition.names, letter-recognition.data).

Samples of characters



Description of the meaning of 16 values in the file "data" for each character

Nouveaux messages (1)
Vers les messages Ignorer



```

C:\Documents and Settings\precisoa\Local Settings\Temp\letter-recognition.names - Notepad++
File Edit Recherche Affichage Encodage Langage Paramétrage Macro Exécution Test? Compléments Documents ?
31 cited above for more details.
32
33 5. Number of Instances: 20000
34
35 6. Number of Attributes: 17 (Letter category and 16 numeric features)
36
37 7. Attribute Information:
38 1. lettr capital letter (26 values from A to Z)
39 2. x-box horizontal position of box (integer)
40 3. y-box vertical position of box (integer)
41 4. width width of box (integer)
42 5. high height of box (integer)
43 6. onpix total # on pixels (integer)
44 7. x-bar mean x of on pixels in box (integer)
45 8. y-bar mean y of on pixels in box (integer)
46 9. x2bar mean x variance (integer)
47 10. y2bar mean y variance (integer)
48 11. xybar mean x y correlation (integer)
49 12. x2ybr mean of x * x * y (integer)
50 13. xy2br mean of x * y * y (integer)
51 14. x-egx mean edge count left to right (integer)
52 15. xegvy correlation of x-edge with y (integer)
53 16. y-egx mean edge count bottom to top (integer)
54 17. yegvx correlation of y-edge with x (integer)
55
56 8. Missing Attribute Values: None
57
58 9. Class Distribution:
59 789 A 766 B 736 C 805 D 768 E 775 F 773 G
60 734 H 755 I 747 J 739 K 761 L 792 M 783 N
61 753 O 803 P 783 Q 758 R 748 S 796 T 813 U
62 764 V 752 W 787 X 786 Y 734 Z
63
Normal text file Length: 2734 Lines: 63 Ln: 50 Col: 43 Sel: 0 UNK ANSI DMS

```

File "data" and 16 values detailed above for each character

Nouveaux messages (1)
Vers les messages Ignorer



```

C:\Documents and Settings\preciso\Local Settings\Temp\letter-recognition.data - Notepad++
Fichier Edition Recherche Affichage Encodage Langage Paramétrage Macro Exécution Test? Compléments Documents ?

letter-recognition.data
1 T,2,8,3,5,1,8,13,0,6,6,10,8,0,8,0,8
2 I,5,12,3,7,2,10,5,5,4,13,3,9,2,8,4,10
3 D,4,11,6,8,6,10,6,2,6,10,3,7,3,7,3,9
4 N,7,11,6,6,3,5,9,4,6,4,4,10,6,10,2,8
5 G,2,1,3,1,1,8,6,6,6,6,5,9,1,7,5,10
6 S,4,11,5,8,3,8,8,6,9,5,6,6,0,8,9,7
7 B,4,2,5,4,4,8,7,6,6,7,6,6,2,8,7,10
8 A,1,1,3,2,1,8,2,2,2,8,2,8,1,6,2,7
9 J,2,2,4,4,2,10,6,2,6,12,4,8,1,6,1,7
10 M,11,15,13,9,7,13,2,6,2,12,1,9,8,1,1,8
11 X,3,9,5,7,4,8,7,3,8,5,6,8,2,8,6,7
12 O,6,13,4,7,4,6,7,6,3,10,7,9,5,9,5,8
13 G,4,9,6,7,6,7,8,6,2,6,5,11,4,8,7,8
14 M,6,9,8,6,9,7,8,6,5,7,5,8,8,9,8,6
15 R,5,9,5,7,6,6,11,7,3,7,3,9,2,7,5,11
16 F,6,9,5,4,3,10,6,3,5,10,5,7,3,9,6,9
17 O,3,4,4,3,2,8,7,7,5,7,6,8,2,8,3,8
18 C,7,10,5,5,2,6,8,6,8,11,7,11,2,8,5,9
19 T,6,11,6,8,5,6,11,5,6,11,9,4,3,12,2,4
20 J,2,2,3,3,1,10,6,3,6,12,4,9,0,7,1,7
21 J,1,3,2,2,1,8,8,2,5,14,5,8,0,7,0,7
22 H,4,5,5,4,4,7,7,6,6,7,6,8,3,8,3,8
23 S,3,2,3,3,2,8,8,7,5,7,5,7,2,8,9,8
24 O,6,11,7,8,5,7,6,9,6,7,5,9,4,8,5,5
25 J,3,6,4,4,2,6,6,4,4,14,8,12,1,6,1,6
26 C,6,11,7,8,3,7,8,7,11,4,7,14,1,7,4,8
27 M,7,11,11,8,9,3,8,4,5,10,11,10,10,9,5,7
28 W,12,14,12,8,5,9,10,4,3,5,10,7,10,12,2,6
29 H,6,9,8,7,6,8,6,6,7,7,9,9,6,8,4,8
30 G,3,6,4,4,2,6,6,5,5,6,6,9,2,8,4,8
31 L,2,3,3,4,1,0,1,5,6,0,0,6,0,8,0,8
32 L,1,3,3,1,1,6,4,1,7,8,3,10,0,7,2,9
33 X,8,12,8,6,4,3,10,4,7,12,11,9,3,7,3,4
34 n 5 0 7 7 10 0 0 4 4 6 0 6 6 11 0 7

Normal text file Length: 712568 Lines: 20001 Ln: 4 Col: 37 Sel: 0 UNDI ANSI DMS

```

(You can go see the doc online at OpenCV:
http://opencv.willowgarage.com/documentation/cpp/ml_neural_networks.html?highlight=mlp).

From this point, we will try to modify the code to put our images as parameters. The idea here is to pass, at first, the raw image in the parameters, the 16x16 pixels in one line to the neural network (or Multiple-Layer Perceptron, MLP).

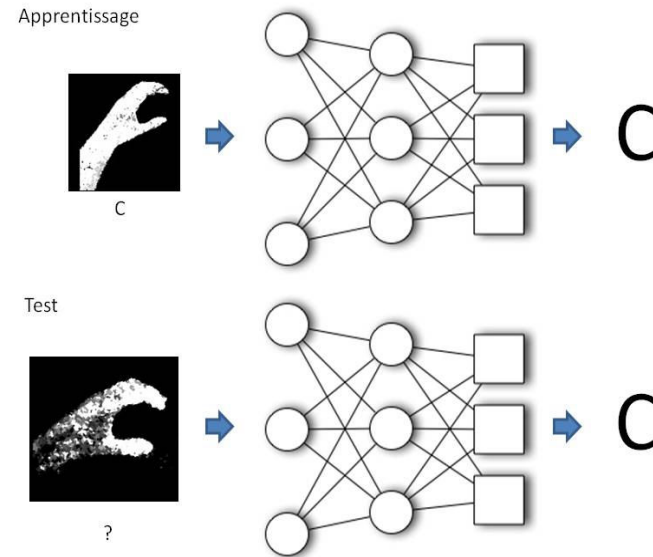
We do not try to extract the 16 previous values of our image of hands, but we change the letter_recog code for it to be considered 16x16 values instead of 16.

In order to randomly mix the lines of your file "letter.txt": copy-paste your text file in the first window and click on shuffle input

Nouveaux messages (1)
 Vers les messages Ignorer



After a learning phase we can test our recognition algorithm.

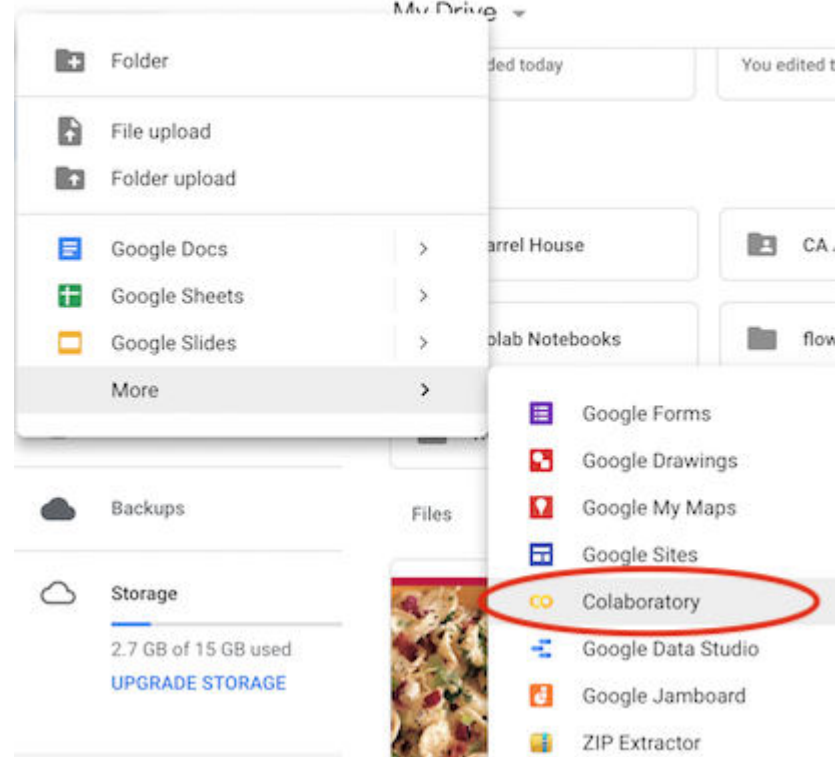


Section 9

Extract features from a pre-trained CNN

To have access to a GPU, you can use Google Colab. You can create a jupyter notebook and access to your files in Google Drive. While you're already in your Google Drive you can create a new Colab notebook. Just click "New" and drop the menu down to "More" and then select "Colaboratory."

Nouveaux messages (1)
Vers les messages Ignorer



To set up your GPU, go to the “runtime” dropdown menu, select “change runtime type” and select GPU in the hardware accelerator drop-down menu.



Runtime type

Python 3 ▾

Hardware accelerator

GPU ▾

☐ Omit code cell output when saving this notebook

CANCEL

SAVE

To use the files from your Google Drive use:

```
from google.colab import drive
drive.mount('/content/gdrive')
```

Run the cell (ctrl+Enter), click the link, copy the code on the page, paste it in the box, hit enter, and you'll see this when you've successfully mounted your drive:

```
[ ] from google.colab import drive
    drive.mount('/content/gdrive')
```

Go to this URL in a browser: <https://accounts.google.com/o/>

Enter your authorization code:

.....

Mounted at /content/gdrive

Use the following code as a guide to extract features from VGG:

Nouveaux messages (1)
Vers les messages Ignorer



```
from keras.layers import Flatten, Input
from keras.models import Model
from keras.applications.vgg16 import VGG16
import glob
import cv2
import numpy as np

path_to_images = "/content/gdrive/My Drive/Images-Test"
paths_list = sorted(glob.glob(path_to_images + "/*"))
X = np.empty((len(paths_list), 224, 224, 3))
for i, image_path in enumerate(paths_list):
    image = cv2.imread(image_path)
    image_resized = cv2.resize(image, (224, 224))
    X[i] = image_resized

input = Input(shape=(224, 224, 3), name = 'image_input')
vgg_model = VGG16(weights='imagenet', include_top=False)

our_feats = vgg_model(input)
our_feats = Flatten()(our_feats)

model = Model(inputs=input, outputs=our_feats)
model.summary() # See our model

output_feats = model.predict(X) # Extract features of our images
print(output_feats.shape)
```

Then create a text file similar to the previous one used for the MLP: First element of the line is the letter and the rest are the 25088 features extracted from VGG.
And now, instead of training your MLP with the pixel values, you train it with the features extracted from VGG.

Nouveaux messages (1)
Vers les messages Ignorer



What others have done using OpenCV and similar algorithms

Those results would be not so bad!

http://www.youtube.com/watch?v=7pi7Me3F_v8

<http://www.youtube.com/watch?v=bUrjFGMfwas>

We can hope to reach this:

http://www.youtube.com/watch?v=cxHMgl2_5zg

or that:

<http://www.youtube.com/watch?v=-NG4BQeNk84>

It would be good that your system, at the end, would be able to discriminate "Hello" <http://lsf.wikisign.org/wiki/Bonjour> ***from ...*** <http://www.youtube.com/watch?v=jhtF9tlx8ws>

Section 13

Sujet de l'examen de MAM 4

Sujet en PDF



Sujet de l'examen de MAM4 2011-2012

Nouveaux messages (1)
Vers les messages Ignorer

mdl

ns

Français (fr) ▾

Connecté sous le nom « Francoise Baude » (Déconnexion)

Francoise Baude



Accueil

Nouveaux messages (1)
Vers les messages Ignorer