**Report:**

https://www.sharelatex.com/project/573dac1ea3f21d1727610441

**Meeting June 9th**

* Today: Roos absent, Diede left at 2, Natanael arrived at 2.30.

Discussed:

- Everyone working on their own project.

- VGG-19 gave too many errors.

- Improved VGG16 by changing folds and epochs.

- All training/validationsets are run and on Git.

- Ensemble started, but VGG is outperforming other models by far.

- See results below this meeting.

- NN is worse than its previous settings.

- Blobs of skin can be detected, now try to cluster it by k-means and train on that.

- Features + HOG gave memory errors in the SVM.

- Report should be worked on as soon as everyone has time.

- Presentation will be done by Laurens and Danielle.

For next meeting:

- Go on with project.

- Work on report

- Clean up Git.

- Start presentation.

**Keras:**

Amount of not classified (when it was that class) in the following classes

c0: 270

c1: 62

c2: 58

c3: 16

c4: 105

c5: 37

c6: 57

c7: 2

c8: 157

c9: 190

Amount of wrongly classified in the following classes

c0: 87

c1: 6

c2: 25

c3: 76

c4: 21

c5: 58

c6: 115

c7: 21

c8: 221

c9: 324

**Polyc01**

Amount of not classified (when it was that class) in the following classes

c0: 522

c1: 438

c2: 411

c3: 394

c4: 457

c5: 161

c6: 430

c7: 150

c8: 155

c9: 264

Amount of wrongly classified in the following classes

c0: 302

c1: 221

c2: 291

c3: 112

c4: 110

c5: 174

c6: 111

c7: 235

c8: 923

c9: 903

HOG

Amount of not classified (when it was that class) in the following classes

c0: 547

c1: 343

c2: 564

c3: 334

c4: 359

c5: 124

c6: 622

c7: 56

c8: 198

c9: 586

Amount of wrongly classified in the following classes

c0: 257

c1: 41

c2: 465

c3: 825

c4: 465

c5: 161

c6: 10

c7: 570

c8: 693

c9: 246

**Meeting June 2nd**

* Today: Laurens absent
  + Roos&Diede: leave at 13:30, returned at 14:00
  + Danielle: leave at 16:00
* Next week:
  + Roos: absent
  + Natanael: back at 3
  + Diede: Untill ~3

Discussed:

- Need trainset en validationset of all!

- Outputfiles have value of 1? —> Yes, this is due to the read\_csv function in pandas.

- Roos:

- Histogram orientated grating + SVM with settings 1.76

Poly SVM with C=0.1

- Stack both features, more parameters more detail but more features.

- Histogram feature 8 and 16 is best. On server.

- Danielle:

- Other methods worsen the score of the Keras because difference so big.

- Look at certainty of Keras and its correspondence with SVM. If score above certain treshold.

- Work on ensemble

- Hand detector code, will not work on cartesius either due to high version of gcc, but lower version needed for MEX

- Diede:

- Features. Use SVC of C = 0.1.

- Use Laplace to optimize logloss, and use algorithm to see effect.

- Natanael:

- Different batchjob, GPU/CPU; now in validationset.

- VGG 19, run and adjust parameters

Before presentation:

- Trainset and validationset, see which models makes which mistakes. Maybe base the ensemble on which model works better with which category.

- Work on current project.

Now, for next time:

- EVERYONE: train on trainset and test on verificationset!

- EVERYONE: Report.

- Danielle: Ensemble, mail them about presentation and report size. Look at cases where Keras does not really know and average our best model with that. Look at combination of features of Caffe and histogram. Ask Maaike how to improve the existing model.

- Natanael: VGG19 is running now. 10 epochs improved it (Player 1, took 50 hours for them). Set VGG16 and VGG19 to epoch 10/11. Vary cross-validations. Train on trainset and test on verificationset.

- Diede: Tuning of probabilities by verificationssets (for after ensemble).

- Roos: Run trainset/verification set. Vary/tune size of cells that make the features. Now they look at 8 orientations of 16x16 pixels. Look at combination of features of Caffe and histogram.

**MEETING May 26th 2016**

All attended.

Discussed:

- Natanael: VGG runs on Cartesius with Keras and OpenCV library. Contacted SurfSara. Code is working, but now another error.

- Diede: Featureselection works for random forest/Xi, should still be tested.

Featureselection per model, make sure that you get the same features to train on! Diede will test it with submission and compare with previous.

- Roos: Movement working and histogram based orientation, make features. Started hand detection-paper. Moved on to Danielle. Today go on with histogram based thing.

- Danielle: Hand-detection took a long time due to missing toolboxes and missing

commands. Try again today. Set up the report, Set up ensemble.

- Laurens: Neural Network, ran out of memory. Trying more stuff out, momentum optimizer, but not impressed. Try with learning rate on fewer features. Featureselection can have

gotten in the way. Try drop-out. Keep track of scores.

For next time:

- Diede: Featureselection + RF does not work, try with SVM. If work, try with more

percentiles. If not work, implement Loglossfunction and improve score.

- Laurens: CNN submission, has added third layer. Skin selecting and finding clusters by finding centers or blobs.

- Roos: Run motion on all images and use simple SVM to see it does something. If time, change parameters. Post features on GIT.

- Natanael: Solve memory error, look at batch jobs. Model is saved, but loading it gives again memory error.

- Danielle: Create ensemble, report, Continue on hand\_detection\_model. One vs One

classifier. Run it on Cartesius.

**Meeting May 19th 2016**

June 2nd, Laurens not there for full time.

**Meeting Machine Learning**

Us: Some classes more easily classified? Adjust probabilities

The wizards of oz: human orientation detection, multilabel network. overestimate confidence + 0.01 to all probabilities. Alexnet on digits. Alexnet fc6+fc7 features on logisticregression (from previous project). Scew it and resize images. On forums: pretrained networks and ext. datasets, orientation link that uses dataset doing sports. VGG16! Kaggle: Player1 (?) and TheWizardsOfOz.

Five nearest neighbours: resized images, grey scale images, mean substraction and permute training data. VGG16! Ensemble. networks for classify gender and objects. random forest.

I am thinking: Naive Bayes. Keras and Sequential. Kaggle: I am thinking !!

2Deep4You: Neural network and pretrained. 30.90252 (for 0.1 for each). Retrain last layers of CNN. AlexNet applied; position 319.

Player 1: Put it on 1 for best prediction, 0.93 score. XGboost and decision boundary for post-processing. Ahv (?) color for skin detection, by saturation. Shuffle the images before training it.

<Insert groupname here>: VGG16. Random Forest. Use lasagne instead of Keras. Logistic regression as last layer and refine by back propagation.

**Meeting Maaike:**

What to ask Maaike:

- Motionvectors/ Actiondetection paper, what is relevant?

- Whole image/Segment —> Person is big part of the image, so whole is better.

- Grayscale/Color for gradient —> If color information is not used, then it does not matter.

- Histogram of output —> Same as features in form of histogram (SVM - non linear.)

- NaN? divide by number?

- Least relevant? Lowest numbers ? Did Chi-squared worked?

- Neural Networks, 1 hidden layer with feature. Low learning rate

- Hidden layer size? Should be around less than half.

- Regularization? Extreme values influence. If bad, how much do you want to

penalize. Also, it is dependent on learning rate. Decrease on learning rate, beta should increase.

- 30% bad? Try to submit it.

- Testdata in tensorflow?

- Advice skin detection

- Use Person detector!

- Clusters might be a problem by clothing.

- Evaluation of first part.

- Someday? Report looked at it should to Maaike.

- Images from side?

- Gain much information? Does not add that much.

- Run the code from the forum, so you have a headstart.

Notes:

- Does feature selection work? Zero-variance features removed. Be carefull not to remove too much, as small features might add a bit.

**Meeting team:**

All attended.

Flash talks done by Nathaneal and Roos

Discussed:

- Roos: Reply to mail to Maaike concerning motionvectors; motionvectors are indeed used for videos. Action detection: may be usable, but not so much for part of body, can we use it for upper body from the side? Paper on IDT trajectory send by Maaike, uploaded to Github: we can use some parts, but may be too time consuming. See what it is based upon, to use parts?

- Diede: Rewritten code, such that code can be run from any folder, also for padded

features. Now feature importance vector selection to use top \_ % for your model. 3900 fea tures left after zero variance removal.

- Laurens: Neural Network is learning something. Problems with testdata loading in

tensorflow, 40/50% reliable. Might work in an ensemble for one or more classes specifically.

- Nathaneal: Random Forests with original and padded images (padded images is better) on all traindata.

- Danielle: Face recognition, not helpful as from side. Used different SVMs, poly is better.

Ideas:

- Recognize phones for example. Generate all objects, see how that goes.

- Which labels are which nodes, find mapping.

- Use VGG?

- Train on hands.

- Start latex

- Locate Human in picture.

- Segment faces, only skincolor?

- Start ensemble

- Patches, look at distance and clusters.

- If not accurate: See if predict one class very well, may be beneficial in ensemble

Before next meeting:

- **Everyone**:

- Use 10/20/30 percent.

-Train models on trainset and test of verificationset for ensemble.

- Danielle: OnevsOneclassifier, see trained on all features vs. zero variance removed. Start latex. Calculate verification score.

- Roos: Person identification, read paper. Send Danielle implementation that is not possible on windows.

- Laurens: Neural Network.

- Nathaneal: Code from Forum.

- Diede: Feature selection, test it. Aother method for feature selection. Neural Network of Laurens?

**Meeting May 12th 2016**

All attended.

Next meeting: May 19th, 12:30/15:30, HG0.217a

Flash talks: May 19th.

Notes:

- Use probability 0.0000000001 instead of 0 (logloss)

- Label images based on folder.

- cv2.imread, cv2.imresize around 5 times faster than scipy’s functions

- Get feature values from Google Drive.

Discussed:

- Select cutting per driver to include eyes and steeringwheel? We do not have ids for the testset. Solution: **Padding of the images.**

- Remove blank images, i.e. Only check for images in trainset, test set does not matter that much, as it would just be a guess. —> There are no empty images in trainset.

• img\_77655.jpg

• img\_79591.jpg

• img\_32463.jpg

- Laurens is working on tensor flow.

- We want to look at position of arms?

- We want to look at position of eyes?

- In LoadingData; for every set, fixed order of images. Check functions in Load.py. Also for featurevalues, when added to the folder (of gitdata).

- The train data is separated (with the same driver in each class) in 1/3 in validation set by 2/3 in trainset.

- Find correlation among features, and remove highly correlated.

- Use neural network for part of the image? Although data set might be too small to be efficient.

- Start : Perform a basic model (SVM & Decision trees).

-Motionvectors: Paper [ ] describes well, however, might only be for whole body. **Mail Maaike about if she thinks it is efficient/usefull.**

-We do not need an extensive neural network as the features are already based on network. To start: Use 2 fully connected layer, starting with a small value.

Today:

-Diede: check empty images, detect features that are equal among images and remove them.

-Roos: Motionvector,

-Danielle: Perform SVM on featurevalues. Research gaze.

-Laurens: Tensorflow.

-Nathaneal: Perform Decision trees on featurevalues. Make submission file

Login Kaggle:

un: TeamBiggerThanBrains

pw: Farwell2012

Submission:

First - 567, 2.26837

Second - 567 - 2.63912,

Third - 567 - 7.93345

By end of today:

-Flashtalk preparations

-Roos & Nathaneal

For next meeting:

- Roos : Recognising actions from still images. Change parameters, improve everything. Feature extraction from border images.

- Diede : Reading feature selection, implement feature selection.

- Laurens : Neural network, higher than 10.7%, work on improving it.

- Nathaneal : Create random forest. Submit. Check forum for other features. Prepare slides.

- Danielle : Train on trainset. OpenCV. Tweak SVM. Prepare slides.

**Meeting 29 april 2016**

Absent: Nathaneal

Future meetings: Thursdays, 12:30/13:30-17:30

Next meeting: May 12th, 12:30/13:30, location to be specified.

Flash talks: May 19th.

Diede absent: 9 juni (afternoon).

Roos absent: 9 juni.

Definitions:

- Traindata = Full data set of train images

- Trainset = Trainpart of the train data (2/3 of the traindata).

- Validationset = Validation part of the train data (1/3 of the traindata).

Challenge:

- Images all same format

- One label per image

- All possible actions/labels per passenger

- 22425 images in train data

- Use 1/3 for validation.

- Submission: Probabilities per class

- Can be 0, Kaggle accounts for it.

Discussed:

- Caffe features with poly kernel SVM/Decision Tree etc.

- Recognise motion vectors.

- Split train data into trainset and validationset

- Deep Neural Network for classification (Lasagne, Theano, TensorFlow ? )

- Make functions for importing data

- Read forum

- Get final layer of Caffe network (detect phones).

- Which number is phones

- Which number is drinks

- Use Cartesius of ml0902

Planning before first meeting (May 12th):

- Cut all images to 224x224(?).

- Import data

- Split train and validationset

- All images per person in the same set.

- Adjust Caffe script for last layer

- Research Forum

- Research motion vectors

- Research Tensor Flow

Done before flash talks, May 19th:

- Run Caffe script

- Make Flashtalks

- One submission

Meeting Maaike:

- May 19th, before flashtalks?

Tasks before next meeting:

Diede:

- Clean Git and divide into project 1 and 2.

- Import data

- Split train/validation

Roos:

- Caffe features

- Size photos network

Laurens:

- Research Tensor Flow

Danielle:

- Research

- Nathaneal added to Git

- Mail Maaike

- Reserve library room

Nathaneal:

- Read previous project

- Images cutten