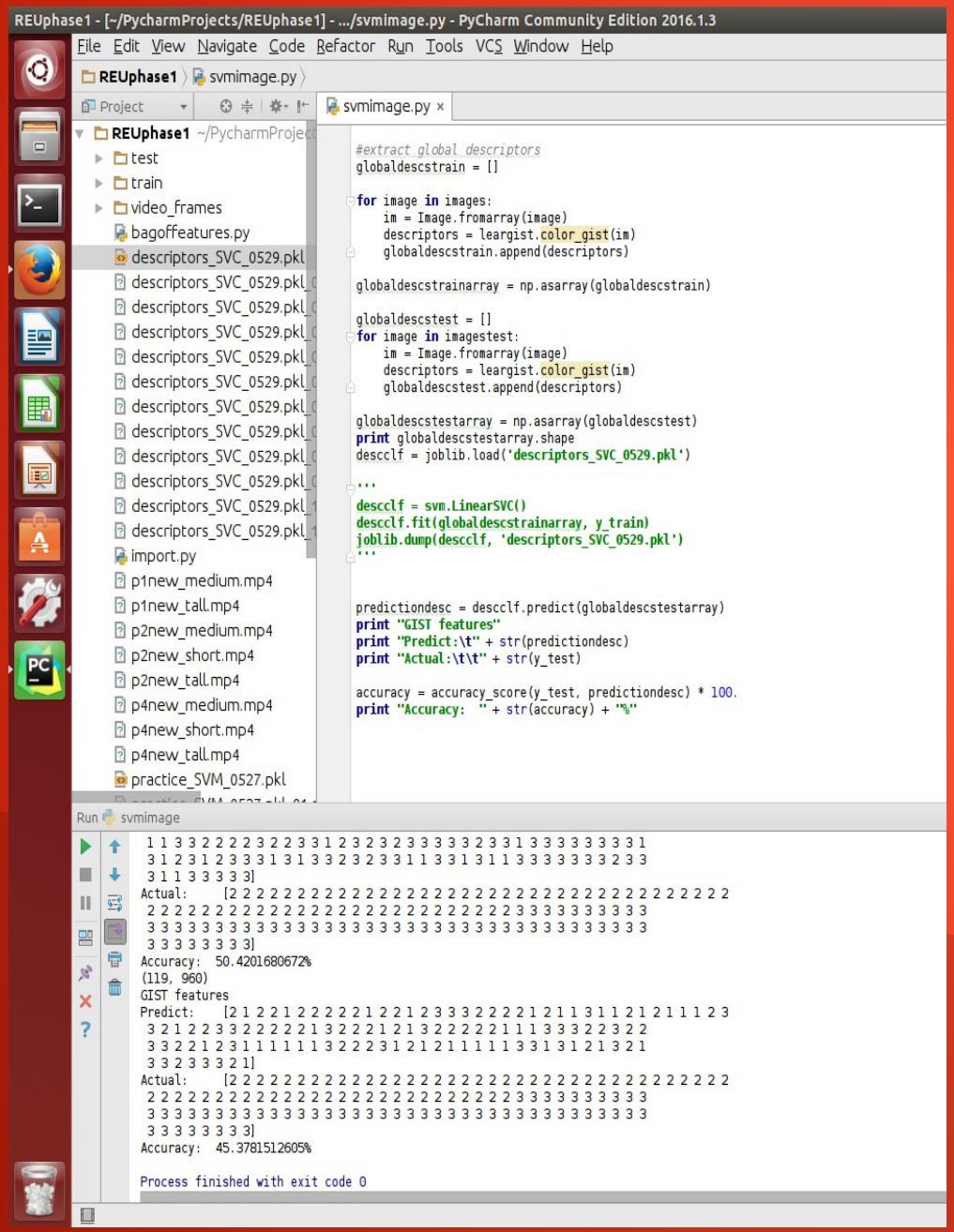
UCF REU: Week 2

Height Estimation from Egocentric Video

REU Student: Jessie Finocchiaro
Graduate Student: Aisha Urooj Khan
Professor: Dr. Ali Borji

Over the weekend


REUphase1 - [~/PycharmProjects/REUphase1] - .../svmimage.py - PyCharm Community Edition 2016.1.3
File Edit View Navigate Code Refactor Run Tools VCS Window Help
REUphase1 svmimage.py
Project
svmimage.py ×
REUphase1 ~/PycharmProje
test
train
video_frames
bagoffeatures.py
descriptors_SVC_0529.pkl
import.py
p1new_medium.mp4
p1new_tall.mp4
p2new_medium.mp4
p2new_short.mp4
p2new_tall.mp4
p4new_medium.mp4
p4new_short.mp4
p4new_tall.mp4
practice_SVM_0527.pkl
#extract global descriptors
globaldescstrain = []
for image in images:
im = Image.fromarray(image)
descriptors = leargist.color_gist(im)
globaldescstrain.append(descriptors)
globaldescstrainarray = np.asarray(globaldescstrain)
globaldescstest = []
for image in imagestest:
im = Image.fromarray(image)
descriptors = leargist.color_gist(im)
globaldescstest.append(descriptors)
globaldescstestarray = np.asarray(globaldescstest)
print globaldescstestarray.shape
descclf = joblib.load('descriptors_SVC_0529.pkl')
'''
descclf = svm.LinearSVC()
descclf.fit(globaldescstrainarray, y_train)
joblib.dump(descclf, 'descriptors_SVC_0529.pkl')
'''
predictiondesc = descclf.predict(globaldescstestarray)
print "GIST features"
print "Predict:\t" + str(predictiondesc)
print "Actual:\t\t" + str(y_test)
accuracy = accuracy_score(y_test, predictiondesc) * 100.
print "Accuracy: " + str(accuracy) + "%"
Run svmimage
Actual: [2 2 2

Differences from person to person



Person 2 Medium Camera



Person 4 Medium Camera

Challenges

- Video alignment
- Train SVM on other descriptors
- Extracting segments of video to use for testing
  - How long
  - How much overlap
- Cross-validation

This week

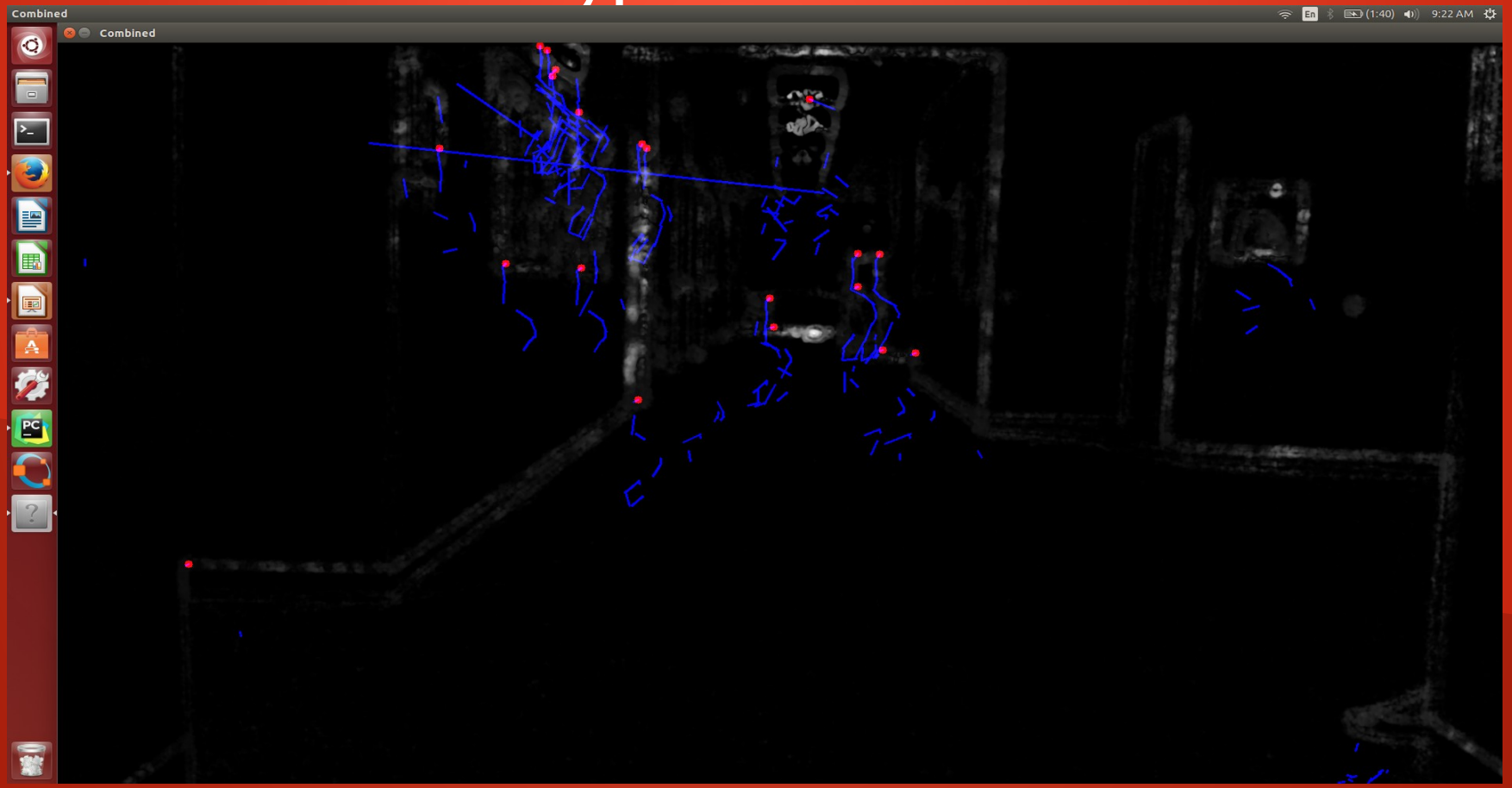
- Finished data collection
- Looked at SIFT Flow, HOG, HOF, and MBH
- Tried implementing by hand
- SIFT Flow is a way of measuring displacement of SIFT descriptor between frames



Energy Function in SIFT Flow

Keypoint Tracking

- Calculate Optical Flow and HOF
- Track keypoint movement over frames
- Show current keypoints



SVM Results

	RBF	Linear	Poly- degree 3	
Raw Images	35.29	30.88	41	
GIST	32.36	50.735	32.35	
HOG	55.147	34.55	32.3529	
SIFT	35.29	48.53	46.323	
HOF	32.59	52.59	32.59	

Cross-Validation (3-fold)

	RBF	Linear	Poly- degree 3	
Raw Images	30.7386	30.755	30.7	
GIST	34.293	34.909	34.17	
HOG	35.022	33.7	34.17	
SIFT	30.74	31.7	31.2	
HOF	34.2055	33.77	34.202	

Cross-Validation (10-fold)

	RBF	Linear	Poly- degree 3	
Raw Images				
GIST				
HOG	37.78	38.619	34.167	
SIFT	40.45567	34.685	34.54	
HOF				