

## Exercise 1 in Computer Vision: Deep Learning

Discussion on 10/14/2019 and 10/21/2019 at 10.00 am – 12.00 am (NB 3/57)

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In the first exercise you should prepare the system you want to work on during the semester. Please set up a Python interpreter on your system and install at least the following packages:

- numpy
- tensorflow

numpy is part of the popular Anaconda distribution, in case you want to use that. You may want to use the pip install tool.

Make sure the following program (attached as tensorflow\_test.py) executes without error:

```
import tensorflow as tf
import numpy as np

tf.reset_default_graph()

x = tf.Variable( np.array( [2, 1] ), dtype=tf.float32, name="x" )
y = tf.constant( np.array( [3, 5] ), dtype=tf.float32, name="y" )

z = tf.placeholder( shape=[None, 2], dtype=tf.float32, name="z" )

print(z)

loss = tf.reduce_sum((x - y + z)**2)

train_step = tf.train.GradientDescentOptimizer(0.1).minimize(loss)

z_ = np.array([[2,0]])

with tf.Session() as sess:
    sess.run(tf.global_variables_initializer())
    for k in range(100):
        train_step.run( feed_dict={z:z_})
        if k % 10 == 0:
            print("Step No. %d" % k)
            print(loss.eval( feed_dict={z:z_}) )
            print( x.eval() )

    print( x.eval() )
```

Try to figure out what this program does. How could you achieve this more easily?