Lab 4 - due 14 May 2017

Your Name

8. mai 2017. a.
References in your solutions

Please add references to any external material that you base your answers on.

Typesetting

Please put your answers in a LaTeX document and submit both a pdf and the LaTeX source. Try to keep a similar template to the one given. You may find it helpful to use sharelatex or install a LaTeX distribution and editor, such as texworks. Some documentation on LaTeX can be found at https://en.wikibooks.org/wiki/LaTeX.

Study material

- Kutz, Data-Driven Modeling and Scientific Computation Chapter 17.
- LaTeX https://en.wikibooks.org/wiki/LaTeX

Cat/Dog recognition

Homework question 1

a) Summarize Chapter 17 of Kutz.
   ANSWER
   COMMENT
   GRADE

b) Write a program for cat/dog recognition following Chapter 17 of Kutz?
   ANSWER
   COMMENT
   GRADE

c) Summarize Brunton, Brunton, Proctor, and Kutz.
   ANSWER
   COMMENT
   GRADE

d) Try modifying the methods introduced to do classification of a two category image data set of your choice.
   ANSWER
   COMMENT
   GRADE
Neural Networks

**Homework question 2**

a) Summarize chapter 17 of Lynch.
   ANSWER
   COMMENT
   GRADE

b) How might neural networks help in improving the cat/dog recognition system?
   ANSWER
   COMMENT
   GRADE

c) What problems might you obtain in using neural networks to help in improving the cat/dog recognition system?
   ANSWER
   COMMENT
   GRADE

d) What is Paddle Paddle (http://www.paddlepaddle.org)?
   ANSWER
   COMMENT
   GRADE

e) Try to run examples for Paddle Paddle.
   ANSWER
   COMMENT
   GRADE
Image processing revisited

**Homework question 3**

a) Summarize Perona and Malik “Scale space and edge detection using anisotropic diffusion”
   
   ANSWER
   
   COMMENT
   
   GRADE

b) Explain what the example 1D nonlinear heat diffusion Octave program does. Consider changing the nonlinearity or modifying how the differential equation is solved. Can you find parameters that preserve large edges but smooth out noise? Can you then do an extension to 2 dimensions for processing images?
   
   ANSWER
   
   COMMENT
   
   GRADE
Kirjandus

[6] LaTeX website http://www.latex-project.org/