

COM2004/3004

Data Driven Computing

Module overview

Dr Po Yang, Dr Matt Ellis, Dr Xingyi Song

Autumn Semester

Department of Computer Science
University of Sheffield

Contacting us

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Dr Xingyi Song: x.song@sheffield.ac.uk

Please take care!

Each week

- Lecture Sessions
Tuesdays 11:00 - 12:50 (St George's Church)
Fridays 11:00 - 12:50 (Diamond LT1)

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- Python programming labs
 - Thursdays 10:00 - 11:50 (Diamond CR3 and CR5)
 - Please bring your own device!
 - Please note that there will be no labs in week 1.

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- Problem sheets

Overview

Part 1: Fundamentals

- Week 1 What is data-driven computing? (Po and Matt)
- Week 2 Multivariate data processing and parameter estimation (Matt)
- Week 3 Linear Classifiers (Matt)
- Week 4 non-parametric Classifiers (Matt)
- Week 5 Reading week

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- Week 5 Reading week

Specific Top 1: Feature Generation

- Week 6 Feature Selection and Dimensionality Reduction (Po)
- Week 7 Further Dimensionality Reduction (Po)

Special Topic 2: Deep Learning

Week 8 An Introduction to Deep Learning (Xingyi)

Week 9 Further Deep Learning (Xingyi)

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Special Topic 3: Unsupervised Learning

Week 10 Unsupervised learning and Clustering (Po)

Week 11 Further Clustering (Po)

Staff

- lectures / tutorials

Dr Po Yang, Dr Matt Ellis, Dr Xingyi Song

- lab classes -

2 GTAs : Wanli Sun, Guannan Lou

4 post-grad helpers:

Andreas Evripidou, Sophie Young, Halle Gordon-Jeary, Kenji Teh

Practical Content

- We will be using Python and the Python 'Numpy' module
- Weekly lab classes linked to lecture content
- Lab classes will be available online via CoCalc
- A Python practical assignment worth 50% of module

After this session visit cocalc.com and make a free account using your University email address.

Assessment

- practical assignment

handout	handin	grade
Fri Week 5	Tues Week 12	50%

- practical assignment

handout	handin	grade
Fri Week 5	Tues Week 12	50%

- formal examination

date	grade
January exam period	50%

Resources

Blackboard

- lecture notes, some video material
- tutorial questions
- assignment details

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CoCalc

- Python lab classes and exercises
- Python notebooks

References:

- Marsland, “Machine Learning: An Algorithmic Perspective”
- Theodoridis and Koutroumbas, “Pattern Recognition”

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Useful web links for Python:

- <https://www.python.org/>
- <https://numpy.org/>
- <https://wiki.python.org/moin/BeginnersGuide/Programmers>
- <http://python4java.necaiseweb.org>
- <https://developers.google.com/edu/python/>
- <http://learnpythonthehardway.org>

See 'Reading List' on Blackboard site.

Any Questions?