QBUS6850

Machine Learning for Business

Introduction to the Unit

Dr. Chao Wang

Discipline of
Business Analytics

S1 2019

THE UNIVERSITY OF
SYDNEY

Lecture

- This unit is offered by the **Discipline of Business Analytics**,

- Unit Co-ordinator & Lecturer: Dr. Chao Wang

  Consultation: Tuesdays, 13:30 to 14:30,

  Room 4044, H70.

- Lectures (Week 1 to Week 13)

  Time: Wednesdays 16:00-18:00

  Room: Carslaw Lecture Theatre 159

Tutorials

Time	Tutorial venue
Mon 17:00	Codrington Computer Laboratory 2
Mon 18:00	Codrington Computer Laboratory 4
Mon 19:00	Codrington Computer Laboratory 4
Tue 10:00	ABS Interactive Learning Studio 1090
Tue 17:00	Codrington Computer Laboratory 2
Tue 18:00	Codrington Computer Laboratory 2
Tue 19:00	Codrington Computer Laboratory 2
Wed 18:00	New Law School Learning Studio 030
Thu 13:00	Codrington Computer Laboratory 2
Thu 17:00	Codrington Computer Laboratory 4
Fri 09:00	Peter Nicol Russell Learning Studio 316

Suggested Reading List

- *Pattern Recognition and Machine Learning* (2006), Chris M. Bishop, Springer. **(Bishop, 2006)**
- *Data Science for Business* (2013), Foster Provost and Tom Fawcett, O'Reilly Media, Inc. **(Provost and Fawcett, 2013)**
- *Introduction to Machine Learning* (2014), Ethem Alpaydin. The MIT Press. **(Alpaydin, 2014)**
- *The Elements of Statistical Learning* (2001), Friedman, Jerome, Trevor Hastie, and Robert Tibshirani. Springer, Berlin: Springer series in statistics. **(Friedman et al., 2001)**
- *An introduction to statistical learning: With applications in R* (2014), Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani. Springer-Verlag, New York: Springer Texts in Statistics. **(James et al., 2014)**

Software

❑ Python *(used in this course)*

❖Free and works on PCs, Mac, Unix/Linux

❖Does statistical modelling, visualisation and programming

❖Can be used for almost all models to be discussed in this class

❑ Matlab

❖Licensed: USyd provides a license to enrolled students and can be downloaded and installed on personal computers

❖ No technical support from the teaching team

❖Other languages: R, SAS etc. However excel is not enough to complete most machine learning tasks

Workload

- **The unit requirements**:
  - Attend a 2-hour lecture per week
  - Attend a 1-hour tutorial class per week
  - Submit individual assignments 1&2 - 10% each
  - Submit the group project report – 20%
  - Complete mid-semester exam - 20%
  - Complete the final exam - 40%

Assessment items

Assessment Title	Assessment Type	Individual/ Group	Assessment Conditions	Program Learning Outcomes Assessed	Length	Weight	Due Time	Due Date	Closing Date
Assignment 1	Assignment	Individual	Compulsory	1, 2, 3, 4, 6	NA	10%	2:00pm	01-Apr-2019	08-Apr-2019
Assignment 2	Assignment	Individual	Compulsory	1, 2, 3, 4, 6	NA	10%	2:00pm	13-May-2019	20-May-2019
Group Project	Assignment	Group	Compulsory	1, 2, 3, 4, 5, 6	NA	20%	2:00pm	31-May-2019	07-Jun-2019
Mid-Semester Test	In-semester Exam (mid)	Individual	Compulsory	1, 2, 3, 4	1.5 hours	20%	~~2:00pm~~	Mid Semester Exam Period	Mid Semester Exam Period
Final Exam	Final Exam	Individual	Compulsory	1, 2, 3, 4	2.5 hours	40%	~~3:30pm~~	Final Exam Period	Final Exam Period
Academic Honesty								Week 4	

Weekly Schedules

Week	List of Topics	Assessments Due
1 **25 Feb 2019**	Machine Learning Foundation; Linear Algebra and Matrix Computation Review	Tutorial classes start this week
2 **4 Mar 2019**	Python Machine Learning	
3 **11 Mar 2019**	Model and Feature Selection	
4 **18 Mar 2019**	Scalable Classification Methods	
5 **25 Mar 2019**	High Dimensional Classification Methods	
6 **1 Apr 2019**	Advanced Classification Techniques I	Assignment 1
7 **8 Apr 2019**	Advanced Classification Techniques II	
8 **15 Apr 2019**	Extreme Gradient Boosting	Mid-semester exam date (TBD)
9 **29 Apr 2019**	Neural Networks and Deep Learning I	
10 **6 May 2019**	Neural Networks and Deep Learning II	
11 **13 May 2019**	Matrix Factorization	Assignment 2
12 **20 May 2019**	Recommendation Systems	
13 **27 May 2019**	Machine Learning with Big Data	Group project

Advice

- You should spend a minimum of 12 hours per week on this unit.
- You must attend all lectures & tutorial, and complete all assessment items.

Communication with Staff

- For **general administrative inquiries:**
  - Contact Ms Darae Jung: darae.jung@sydney.edu.au
  - Discipline Executive Officer of the Discipline of Business Analytics, in Room 4082, H70

- For **inquiries about teaching materials (Technical)**
  - Preferred method of communication is joining the consultation during office hour, and posting your questions on **Ed discussion**
  - Enquiries sent by email will NOT be accepted.

- For **administrative & all other general inquiries about this unit (Non-technical)**
  - Preferred method of communication is verbal, during consultation hour.
  - Email correspondence is also preferred.

Communication with Staff

A Rule that you must follow

Emails must be sent from your university email account. On the subject line, you must write **"QBUS6850– Your Name (Your SID) – Keywords of your inquiries".**

- Many emails are received every day, so there is no guarantee that your emails will be answered immediately.
- Emails sent from non-university email account will not be read & replied.
- Emails with correct subject line will receive high priority.

Need Help?

- Discipline of Business Analytics
  - Unit Coordinator and Tutors
- Business School
  - PASS (Peer-Assisted Study Sessions) – Free enrolment
    http://sydney.edu.au/business/learning/students/pass
  - Maths in Business – Free enrolment
    http://sydney.edu.au/business/learning/students/maths
- Faculty of Science
  - Mathematics Learning Centre at Level 4, Carslaw Building (Email: mlc.enquiries@sydney.edu.au)

Big Data in Business specialisation

The Big Data in Business specialisation is designed to provide students with specialised training in the areas of big data and analytics in order to succeed and thrive in today's business world. The specialisation is comprised of units of study offered by the Disciplines of Business Analytics, Business Information Systems, Marketing and the Institute of Transport and Logistics Studies that have been specifically chosen for their focus and emphasis on dealing with big data, as well as associated analytical tools and technologies, to help solve real business problems and make effective business decisions.

About this specialisation

To meet requirements for the Big Data in Business specialisation in the Master's degree, you will complete five units of study (30 credit points), as follows:

(1) one six credit point prerequisite foundational unit of study as follows:

- *Quantitative Methods for Business.*

(2) one six credit point compulsory (core) unit of study as follows:

- *Data Science in Business.*

(3) three elective units of study (18 credit points) selected from the options listed for the specialisation, including:

- *Applied GIS and Spatial Data Analytics*
- *Customer Analytics and Relationship Management*
- *Data Visualisation*
- *Machine Learning for Business*
- *Managing Business Intelligence*
- *Marketing Research Concepts*
- *Predictive Analytics*
- *Statistical Learning and Data Mining*
- *Visual Data Analytics.*

For unit availability please refer to the "Units of study in this specialisation" section below.

https://sydney.edu.au/courses/subject-areas/spec/big-data-in-business.html

Hope you enjoy this unit!

Discipline of Business Analytics

University of Sydney Business School