QBUS6850

Machine Learning for Business

Introduction to the Unit

Professor Junbin Gao

Discipline of
Business Analytics

S2 2018

THE UNIVERSITY OF
SYDNEY

Teaching Team

- Unit Co-ordinator & Lecturer: Professor Junbin Gao

  Consultation hour: Tuesdays 14:00-15:00.

  Room 4085, H70.

- Lecturer: Dr Jie Yin

  Consultation hour: Mondays 15:30 – 16:30

  Room 4035, H70.

- Lecturer: Dr Thang Bui

  Consultation hour: Wednesdays 14:30 – 15:30

  Room 4037, H70.

Lectures

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

Lectures *(Week 1 to Week 13)*

- **Time**: Mondays 13:00-15:00

  Room: ABS Case Study Lecture Theatre 1060, H70

  Lecturer: Professor Junbin Gao

- **Time**: Mondays 16:00-18:00

  Room: ABS Case Study Lecture Theatre 1060, H70

  Lecturer: Dr Thang Bui

- **Time**: Tuesdays 14:00-16:00

  Room: Carslaw Lecture Theatre 273

  Lecturer: Dr Jie Yin

Tutorials

Tutorials *(Week 1 to Week 13)*

- **Time:** Mon 12:00 or 18:00 or 19:00
  Room: Codrington Computer Laboratory 2 (H69 building)

- **Time:** Mon 17:00
  Room: Codrington Computer Laboratory 4 (H69 building)

- **Time:** Tue 10:00 or 18:00 or 19:00
  Room: Codrington Computer Laboratory 2 (H69 building)

- **Time:** Tue 12:00
  Room: Codrington Computer Laboratory 5 (H69 building)

Tutorials

- **Time:** Wed 17:00
  Room: Codrington Computer Laboratory 2 (H69 building)

- **Time:** Thu 17:00 and Fri 09:00
  Room: Codrington Computer Laboratory 2 (H69 building)

- [The Stream with Special Time Slots]
  Time: 18:00 Wed (week 3,5,7,9,11,13) and 19:30 Wed (week 1-2,4,6,8,10,12)
  Room: Codrington Computer Laboratory 2 (H69 building)

Note:

- This unit contains a 1-hours tutorial which focuses on practical exercises using Python
- Students must attend their centrally assigned tutorials

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%

Weekly Schedules

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%	5:00pm	03-Sep-2018	10-Sep-2018
Assignment 2	Assignment	Individual	Compulsory	1, 2, 3, 4, 6	NA	10%	5:00pm	15-Oct-2018	22-Oct-2018
Group Project	Assignment	Group	Compulsory	1, 2, 3, 4, 5, 6	NA	20%	5:00pm	29-Oct-2018	05-Nov-2018
Mid-Semester Test	In-semester exam (mid)	Individual	Compulsory	1, 2, 3, 4	2 hours	20%		Mid Semester Exam Period	Mid Semester Exam Period
Final Exam	Final exam	Individual	Compulsory	1, 2, 3, 4	3 hours	40%		Final Exam Period	Final Exam Period
Academic Honesty								Week 4	

Weekly Schedules

Week	List of Topics	Assessments Due
1 **30 Jul 2018**	Machine Learning Foundation; Linear Algebra and Matrix Computation Review	Tutorial classes start this week
2 **6 Aug 2018**	Python Machine Learning	
3 **13 Aug 2018**	Model and Feature Selection	
4 **20 Aug 2018**	Scalable Classification Methods	
5 **27 Aug 2018**	High Dimensional Classification Methods	
6 **3 Sep 2018**	Advanced Classification Techniques I	Assignment 1 due 03-Sep-2017
7 **10 Sep 2018**	Advanced Classification Techniques II	
8 **17 Sep 2018**	Extreme Gradient Boosting	Mid-semester exam date (TBA)
Common week 24 Sep to 30 Sep		
9 **1 Oct 2018**	Neural Networks and Deep Learning I	
10 **8 Oct 2018**	Neural Networks and Deep Learning II	
11 **15 Oct 2018**	Matrix Factorization	Assignment 2 due 15-Oct-2017
12 **22 Oct 2018**	Recommendation Systems	
13 **29 Oct 2018**	Machine Learning with Big Data	Group project due 29-Oct-2017

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 Colleen, Phone: 9351 3069

  - Discipline Executive Officer of the Discipline of Business Analytics, in Room 4082, Abercrombie Building

- 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 office 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 "OPUS6850 Tutorial Stream: 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, Lecturers 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

Specialisation outline

To meet requirements for this specialisation in the Master's degree, you complete five units of study (30 credit points), comprising:

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

- QBUS5001 *Quantitative Methods for Business.*

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

- BUSS6002 *Data Science in Business*

(2) 18 credit points in elective advanced units of study selected from the available elective options listed in the University of Sydney Business School (Postgraduate) Handbook, including:

- INFS6018 *Managing Business Intelligence*
- INFS6023 *Data Visualisation*
- ITLS6107 *Applied GIS and Spatial Data Analytics*
- MKTG6001 *Marketing Research Concepts*
- MKTG6018 *Customer Analytics and Relationship Management*
- QBUS6810 *Statistical Learning and Data Mining*
- QBUS6840 *Predictive Analytics*
- QBUS6850 *Machine Learning for Business.*

* Not offered in 2017.

http://sydney.edu.au/courses/master-of-commerce/specialisation-big-data-in-business

Hope you enjoy this unit!

Discipline of Business Analytics

University of Sydney Business School

sydney.edu.au/business/business.analytics

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