

Machine Learning & Pattern Recognition

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About Me



Dr. SONG Xuemeng (宋雪萌)

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Consultation: by appointment

- **Ph.D., National University of Singapore (2012-2016)**
- **B.Eng., University of Science and Technology of China (2008-2012)**
- **Research Interests:**
 - **Information retrieval**
 - **Multimedia analysis**

Objectives

- To equip students with knowledge of common *statistical machine learning* and *pattern recognition algorithms* and techniques.

Teaching Partner



Dr. Liqiang Nie (聂礼强).

Professor, Qilu Scholar, PhD supervisor.

Project of Thousand Youth Talents 2016.

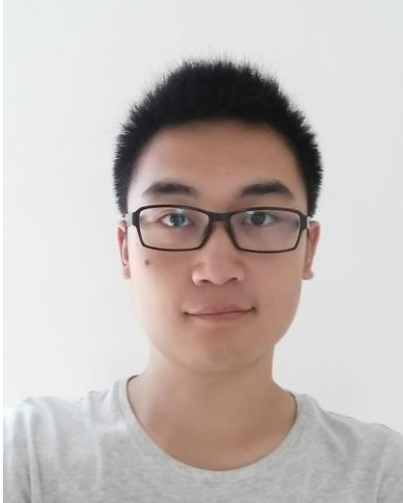
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- **Ph.D., National University of Singapore (2009-2013)**
- **B.Eng., Xi'an Jiaotong University (2005-2009)**
- **Research Interests:**
 - **Information retrieval**
 - **Multimedia analysis**

Teaching Assistant



Mr. LIN Junyu (林俊宇)

Master Student

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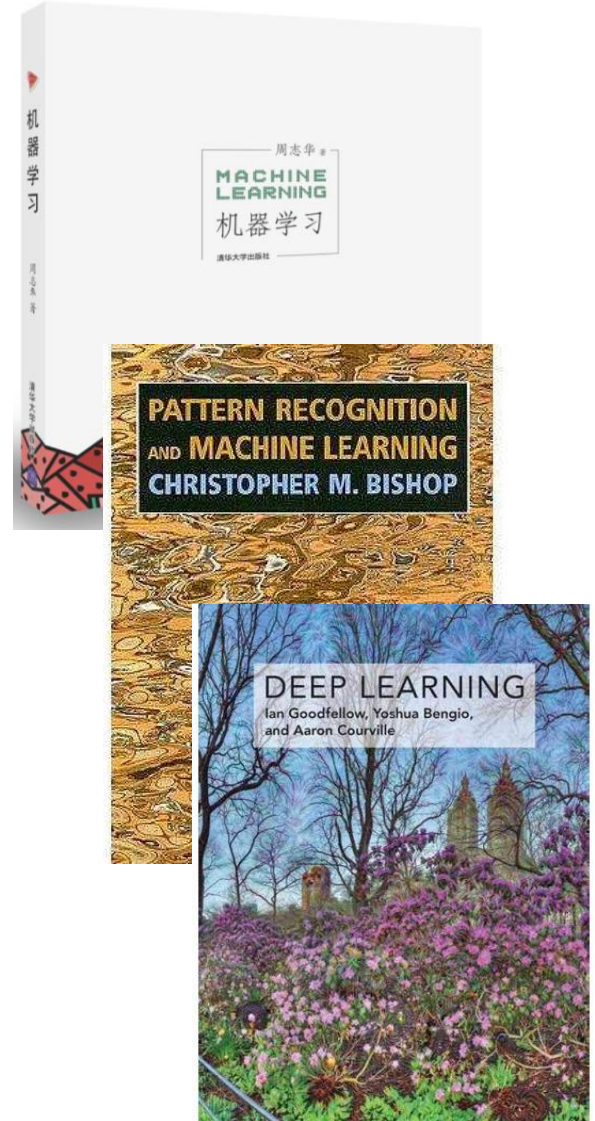
- **B.Eng., Shandong University** **(2014-2018)**
- **Research Interests:**
 - **Information retrieval**
 - **Multimedia analysis**

Prerequisites

- Familiar with *probability*, *statistics* and *linear algebra* (vector spaces and matrix theory) as thought in typical undergraduate courses.
- Familiar with programming environments such as MATLAB, Python or be able to program in standard languages such as C, C++, etc.

Text Book and References

- 机器学习（周志华）
- Pattern Recognition and Machine Learning (*Christopher Bishop*) (**E-edition**)
- Deep Learning (*Ian Goodfellow, Yoshua Bengio, Aaron Courville*) (**E-edition**)
- Lectures are important, but not enough.
- You are strongly suggested to explore more (via the **Internet** or even just the **wikipedia**) after the class.



Assessment

- Lecture slides in PDF format
 - Via the link the QQ group.
- Homework assignments (5%)
 - Solutions will be provided one week after.
- Experiments (15%)
 - Will be released soon.
- Final Project (20%)
 - Will be released soon.
- Final Exam (60%)
 - Closed-book, 2 hrs.

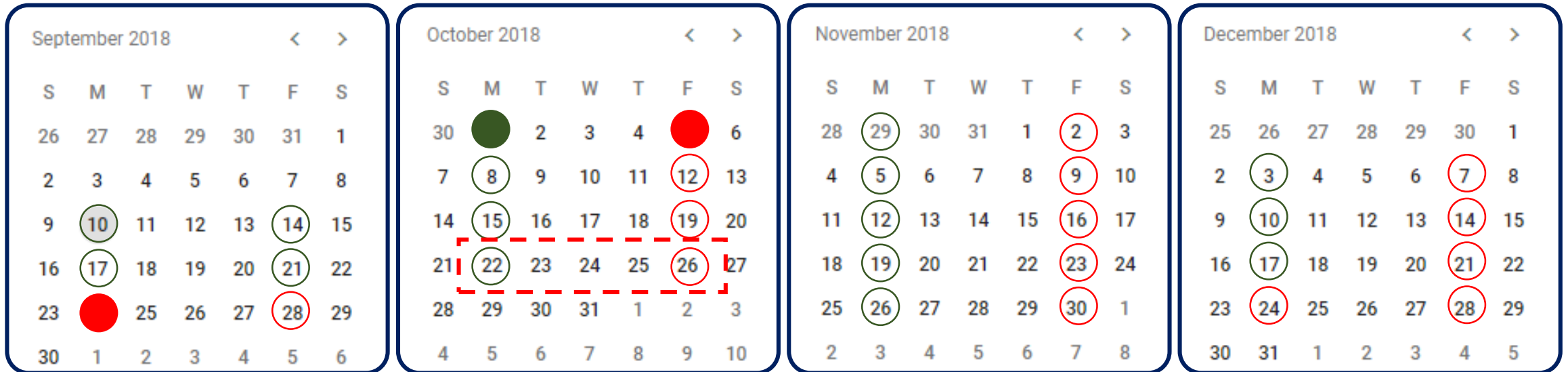


16智能

扫一扫二维码，加入该群。

Schedule

- Monday: 5-6-7; Friday: 5-6.
- ○ : Theory. ○ : Experiment, Location: N3 124 (126).
- ●&● : No class (Public holiday).
- [] : To be determined.



Feedbacks

- Gather feedback via the education admin system.
- Your opinions do matter. **Please participate!**
- If you find any typos (or any other problems) in the slides, please feel free to contact me at sxmustc@gmail.com or talk to me directly in the class. Thanks!

The screenshot shows the '本科生教务管理系统' (Undergraduate Education Management System) interface. The header includes the Shandong University logo and name. The main navigation menu on the left contains links for '联系方式' (Contact), '课程' (Courses), '教学日历' (Teaching Calendar), '成绩' (Grades), '教学评估' (Teaching Evaluation), '课堂教学评估查询' (Classroom Teaching Evaluation Query), '督导评估' (Supervision Evaluation), and '系统帮助' (System Help). The right sidebar shows the breadcrumb '主页 > 评估 > 评估查询' (Home > Evaluation > Evaluation Query). Below this is a search condition section with '学年学期' (Academic Year and Semester) dropdowns. The main content area is titled '课程列表' (Course List) and shows a table of academic years and semesters.

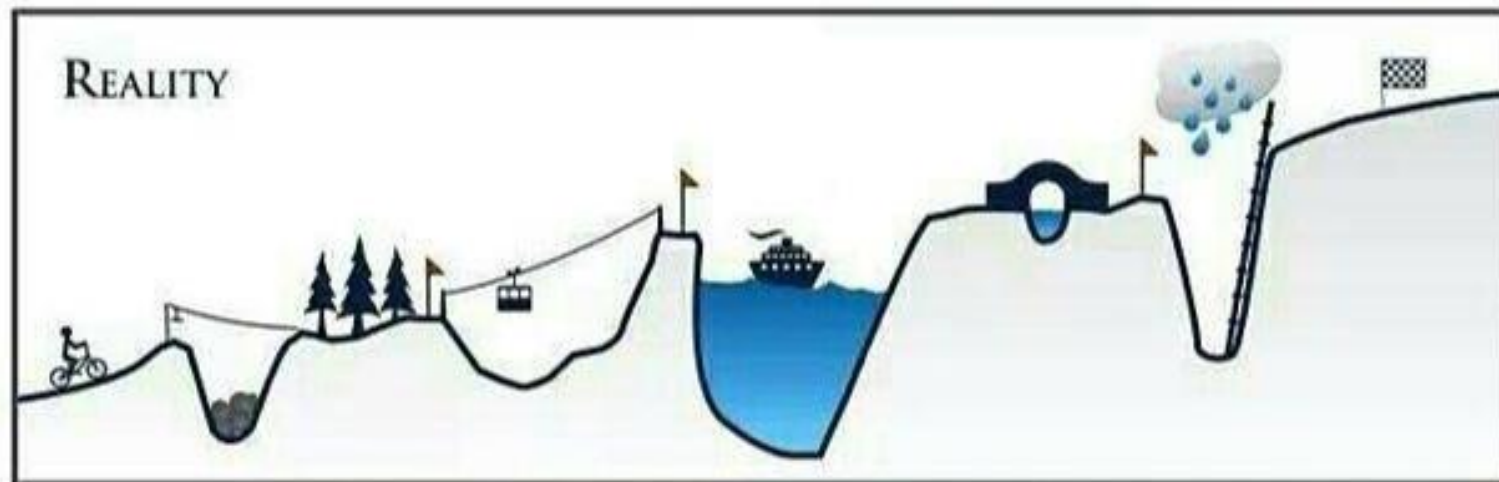
学年学期
2017-2018-2
2017-2018-2
2017-2018-2
2017-2018-1
2017-2018-1

Syllabus

I *plan* to introduce the following topics...

1. Introduction to Machine Learning
2. Review of linear algebra & probability
3. Linear Algorithms
4. Optimization methods (GD, Newton, Momentum, SGD...)
5. Unsupervised Feature Extraction (PCA, NMF)
6. Supervised Feature Extraction (LDA)
7. Bayesian Decision Theory
8. K-Nearest-Neighbor (KNN)
9. Deep Learning
10. Support Vector Machine
11. Decision Tree
12. Clustering---K-means, Hierarchical clustering
13. Ensemble Methods (Bagging and Boosting)
14. Feature Selection (Sparse Coding)
15. Generative Adversarial Networks (GAN)
16. Maybe some other new topics...

However...



Hope you would enjoy it.

