CSCE 509
Pattern Recognition

Time and Place

MW 8:30-9:45 a.m.; Oliver 113

Instructor

C.H. Chu

chu@louisiana.edu

Oliver 304

Hours: Mon, Wed 10-11 a.m.; or by appointment

I have another office at Abdalla Hall
Please do not come to Abdalla Hall without an appointment. If I am there I usually have meetings already set up

References

- Y.S. Abu-Mostafa, M. Magdon-Ismail, H.-T. Lin, *Learning from Data*, AMLbook.com, 2012.
- C.M. Bishop, *Pattern Recognition and Machine Learning*, Springer, New York, 2006.
- R. O. Duda, P. E. Hart, and D. G. Stork, *Pattern Classification*, 2nd ed., Wiley, New York, 2001.
- B. D. Ripley, *Pattern Recognition and Neural Networks*, Cambridge University Press, Cambridge, U.K., 1996.

Prerequisites

- Understanding of
  - Linear algebra
  - Vector/matrix notations and manipulation methods
  - Concepts of probability theory

Class Policy

- Academic honesty is expected
- Attendance
  - You are responsible for everything covered in class
  - I shall be happy to clarify lecture material during the lecture, during my office hours, or by email
  - But do not expect me to repeat the lectures at your convenience or when the assignments are due

Class Policy

- Powerpoint presentations, if used, will be posted in Moodle
- Assignments will be announced in class and posted in Moodle

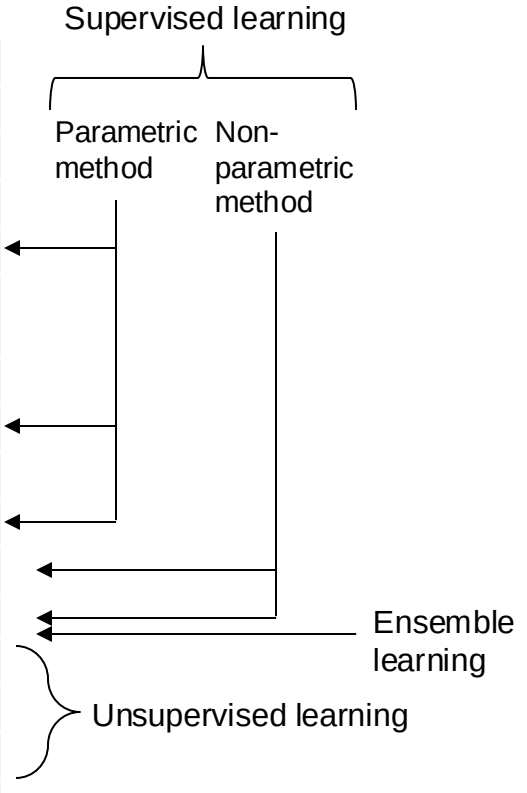
What is Pattern Recognition?

"The field of pattern recognition is concerned

- with the automatic discovery of regularities in data through the use of computer algorithms and
- with the use of these regularities to take actions such as classifying the data into different categories"

Topics

Mon	Wed	Module	Topic
-	15-Jan	0	Syllabus. Class policy
20-Jan	22-Jan	1	Introduction
27-Jan	29-Jan	2	Optimal decision rule for classification problem
3-Feb	5-Feb	5	linear classifier: perceptron. LMS
10-Feb	12-Feb	3, 4	learning problem. Cross validation; Bias vs variance
17-Feb	19-Feb	6	python implementation
24-Feb	26-Feb	7	neural networks
3-Mar	5-Mar	-	Mardi Gras
10-Mar	12-Mar	8	Support vector machines
17-Mar	19-Mar	9	K-nearest neighbors
24-Mar	26-Mar	10	decision tree. Random forest. Xgboost
31-Mar	2-Apr	11, 12	pca, projections; k-means
7-Apr	9-Apr	13	hierarchical. Dendrogram
14-Apr	16-Apr	14	dbscan
21-Apr	23-Apr	-	Spring Break
28-Apr	30-Apr	-	Review



January

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February

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March

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April

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May

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#lecture days = 26

January

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February

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March

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April

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May

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28	29	30	31			

#in-class lecture days = 20
#recorded lecture days = 6

Assignments

- All implementation assignments **require** a written report describing your work
- You must include
  - a report as a PDF file
  - a zip file of your code, screenshots, etc

  as separate files when submitting your work in Moodle
- Simply turning in your code will not earn full credit

Assignments

- Must use Python 3.0 or above
  - No R, matlab, Java, Javascript, etc.
- Available in the CSCE/Swamp lab on the 3rd floor
- You may use your own computer but will be on your own