Time & Location: TTh 1:15-2:35 SS256
Text: Lecture slides of the instructor
Instructor: Professor Siwei Lyu, LI-83A
Office Hours: Tuesday 12:00p-1:00p, Thursday 12:00p-1:00p or by appointment
Email: please use Blackboard mail system, usually you can rely on a 24-hour turnaround on your questions, as the account will be checked daily.

Brief description:
Machine learning is an important and rapid growing branch of artificial intelligence. The aim of machine learning is to design algorithm that can extract information from environment automatically and improve its ability to perform the intended task. Currently, machine learning has been applied in various fields including engineering, bioinformatics, data mining and neurosciences, to name a few. This course provides a broad introduction to machine learning. Specifically, topics that will be covered in the class may include:
- numerical optimization methods that are essential for machine learning algorithms
- dimension reduction methods: principal component analysis & ISOMAP
- classification methods: linear discriminant analysis, k-nearest neighbor classifier, and logistic regression
- regression methods: least squares regression, ridge regression, and l1 regularized least squares regression (LASSO)
- clustering methods: k-means clustering and EM algorithm
- neural networks
- support vector machines for classification and regression

The prerequisite of this course include basic knowledge of
- Linear Algebra (AMAT 220 or equivalent)
- Multivariate calculus (AMAT 214 or equivalent)
- Discrete probability (AMAT 367 or equivalent)
- Numerical methods (CSI 401 or equivalent).

The final grade is composed as following: 30% in-class quiz, 40% homework, 30% final project.

Policy:
1. late homework turn-in is not permitted. Any homework turned in after the due date and time will not be graded.
2. make-up homework and quiz: There is no make-ups for late turned in homework or missing quiz due to no show in class.
3. attendance: After three no shows in class without acceptable explanation, the grade will be automatically reduce to an F.
4. incomplete grade: This class will not give any incomplete grade. If the work cannot complete in the current semester, the student can choose to retake this class in the following year.
5. cheating in homework and exam is absolutely prohibited, and if found, will be reported to the department and university for disciplinary actions.