Course Information

Mehul Motani

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Administrative Details

Instructor:	Mehul Motani
Email:	motani@nus.edu.sg mehul.motani@gmail.com
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Hours:	By appointment

Assessment:	40% Quiz
	20% Assignment
	40% Project

Syllabus / Topics

- Applications of AI/ML to IoT based systems
- Supervised Machine Learning Algorithms
 - Linear Regression
 - Decision Trees & Random Forest
 - Support Vector Machines
 - Neural Networks
- Performance Evaluation
 - Confusion matrix
 - Bias vs. Variance

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Learning outcomes

After you complete the module, you should be able to:

- 1. Understand network architectures and protocols for Internet-of-Things networks.
- 2. Identify and differentiate supervised and unsupervised machine learning algorithms.
- Deploy machine learning algorithms on complex real-world IoT data sets.
- 4. Analyze and visualize complex real-world IoT data sets.

What are we going to do in class?

- Online videos to learn and understand the basics of machine learning
- Interactive sessions to clarify details and answer student questions
- Online quizzes to test your basic knowledge of the material
- Programming assignments in Python to allow you to practice implementing machine learning algorithms
- More complex project to combine your machine learning skills with creative problem solving

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Course References

- An Introduction to Statistical Learning: (2013) (Springer Series in Statistics), by G. James, D. Witten, T. Hastie and R. Tibshirani http://www-bcf.usc.edu/~gareth/ISL/
- The Elements of Statistical Learning: Data Mining, Inference, and Prediction (Springer Series in Statistics) (2009), by T. Hastie, R. Tibshirani, J. H. Friedman. http://web.stanford.edu/~hastie/ElemStatLearn/
- Understanding Machine Learning: From Theory to Algorithms, by Shai Shalev-Shwartz and Shai Ben-David, Cambridge University Press, 2014.
- Internet-of-Things (IoT) Systems: Architectures, Algorithms, Methodologies, by Dimitrios Serpanos and Marilyn Wolf, Springer, 2017.
- Computer Networking: A Top-Down Approach Featuring the Internet, by J. Kurose & K. Ross, Pearson/Addison-Wesley, 3rd edition, May 2004. 4th edition, July 2007.
- Other links to references will be provided throughout the semester and updated on the course webpage.

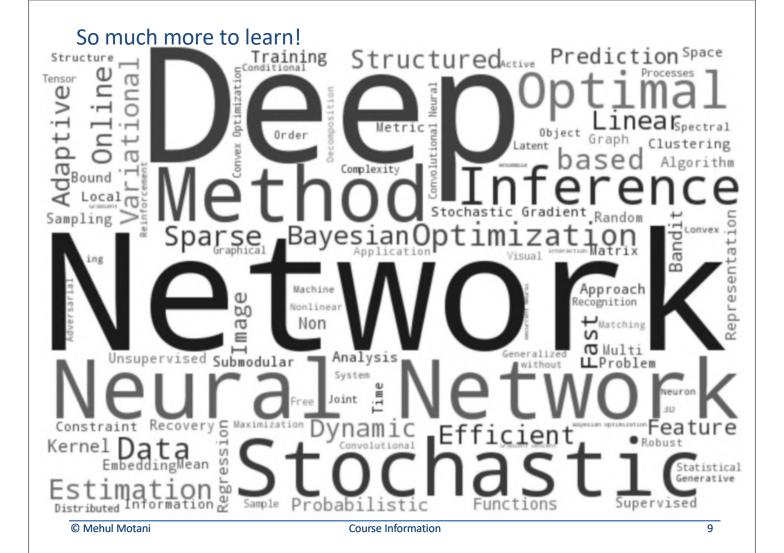
Getting to know each other

- Why are you taking this class?
 - Do some self-reflection and let me know your goals for this class.
- How will we run the class?
 - Video lectures and Interactive sessions
 - Critical Thinking and Independent learning
- What do I expect?
 - Watch the lecture before the interactive sessions
 - Do the assignments and homeworks
 - Ask questions Feel free to email me if you have questions.
 - Read the assigned materials and also read/learn things on your own.
- What will you get out of it?
 - Understand Concepts of Data Science/ML
 - Learn how to think about problems and solutions
 - Learn how to learn

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Learning How to Learn

- Cultivate your curiosity You should read extensively outside of class. Read blogs and technical papers.
- Talk to Other Professors and Students
 - Find out what other researchers are working on to get a broad idea of the research space
- Good source of references include:
 - Blogs, Textbooks, Magazines and Journal articles
 - NUS: Physical Library & Digital Library
 - IEEEXplore database, ACM Digital Library
 - Machine Learning Research: PMLR / JMLR
 - Arxiv.org, Baidu, Google
- Great Web Site for Advice on Research: http://www.cs.cmu.edu/~mleone/how-to.html



So much more to learn!

