

Multimedia in Social Networks (MM)

Place: Room 108, Old Building, IIS, AS / R601, Delta Building, NTHU

Time: 09:00-12:00 Tue

Chair: Dr. Wen-Huang Cheng
Dr. Hwann-Tzong Chen
Dr. Wen-Hung Liao
Dr. Chia-Wen Lin
Dr. Yi-Hsuan Yang

Outline:

1. Introduction to Multimedia
 - 1.1. What is Multimedia?
 - 1.2. Overview of Multimedia Applications
 - 1.3. Multimedia Research Resources
2. Multimedia Basics
 - 2.1. Graphics and Image Data Representations
 - 2.2. Color in Image and Video
 - 2.3. Fundamental Concepts in Video
 - 2.4. Basics of Digital Audio
3. Multimedia Processing & Coding
 - 3.1. Video coding fundamentals
 - 3.2. Lossless Compression & Lossy Compression
 - 3.3. Transform Coding
 - 3.4. Motion Compensated Predictive Coding
4. Multimedia Coding Standards
 - 4.1. JPEG, JPEG-2000
 - 4.2. H.261, H.263, MPEG-1, MPEG-2, MPEG-4, and H.264
5. Social Network Basics
 - 5.1. An Introduction to Social Networks
 - 5.2. Properties and Models of Social Networks
 - 5.3. Centrality Analysis and Community Detection
 - 5.4. Information Diffusion in Social Networks
6. Social Multimedia Analytics
 - 6.1. Sentiment, Opinion, Locations, and Multimedia
 - 6.2. Search and Recommendation in Social Media
7. Machine Learning in Social Multimedia Analytics
 - 7.1. Unsupervised Learning
 - 7.2. Discriminative Models
 - 7.3. Generative Graphical Models
8. Advanced Multimedia Processing
 - 8.1. Image Manipulation Techniques
 - 8.2. Interactive Multimedia Editing

Textbook/Reference:

1. Ze-Nian Li, Mark S. Drew, and Jiangchuan Liu, *Fundamentals of Multimedia*, 2nd edition, Springer, 2014.
2. Gonzalez and Woods, *Digital Image Processing*, 3rd edition, Prentice Hall, 2008.
3. Christopher M. Bishop, *Pattern Recognition and Machine Learning*, Springer, 2007.
4. Richard Szeliski, *Computer Vision: Algorithms and Applications*, Springer, 2010.
5. Richard J. Radke, *Computer Vision for Visual Effects*, Cambridge University Press, 2012.
6. S. Wasserman and K. Faust, *Social Network Analysis: Methods and Applications*, Cambridge University Press, 1994.
7. R. A. Hanneman and M. Riddle, *Introduction to Social Network Methods*, University of California, 2005.
http://faculty.ucr.edu/~hanneman/nettext/Introduction_to_Social_Network_Methods.pdf
8. R. Zafarani, M. A. Abbasi, and H. Liu, *Social Media Mining: An Introduction*, Cambridge University Press, 2014.
9. Charu C. Aggarwal, *Social Network Data Analytics*, Springer, 2011.
10. W. Chen, L. V.S. Lakshmanan, and C. Castillo, *Information and Influence Propagation in Social Networks*, Morgan & Claypool Publishers, 2013.
11. Selected research papers.

Office hours: by appointment

Grades:

- **Class Participation (10%)**
- **Homework Assignments: (20%)**
- **Midterm Exam (30%)**
- **Final Project (40%)**
 - **Proposal: 10%**
 - **Demo: 20%**
 - **Report: 10%**

Week	Date	Topics/Brief Description	Lecturers
1	2017/02/14 N101	Introduction to Multimedia	Wen-Huang Cheng
2	2017/02/21 N101	Multimedia Basics (I)	Wen-Hung Liao
3	2017/02/28	holiday	
4	2017/03/07 O108	Multimedia Basics (II)	Wen-Hung Liao
5	2017/03/14 NTHU	Multimedia Processing & Coding (I)	Chia-Wen Lin
6	2017/03/21 NTHU	Multimedia Processing & Coding (II)	Chia-Wen Lin
7	2017/03/28 NTHU	Multimedia Coding Standards	Chia-Wen Lin
8	2017/04/04	Holiday	
9	2017/04/11	Audio/Music Analysis in Multimedia (I)	Yi-Hsuan Yang
10	2017/04/18	Audio/Music Analysis in Multimedia (II)	Yi-Hsuan Yang
11	2017/04/25	Midterm Exam	-----
12	2017/05/02	Final-Project Proposal Presentation Machine Learning in Social Multimedia Analytics	Wen-Hung Cheng
13	2017/05/09	Multimedia Recommendation	Yi-Hsuan Yang
14	2017/05/16	Social Multimedia Applications	Wen-Hung Cheng
15	2017/05/23 NTHU	Advanced Multimedia Processing (I)	Hwann-Tzong Chen
16	2017/05/30	Holiday	
17	2017/06/06 NTHU	Advanced Multimedia Processing (II)	Hwann-Tzong Chen
18	2017/06/13 NTHU	Advanced Multimedia Processing (III)	Hwann-Tzong Chen
19	2017/06/20	Final Project Demo and Presentation	