

Multimedia in Social Networks (MM)

Place: Room 107, New Building, IIS, AS / R601, Delta Building, NTHU

Time: Mon, 14:00-17:00

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	2018/02/26	Introduction to Multimedia	Wen-Huang Cheng
2	2018/03/05	Multimedia Basics (I)	Wen-Hung Liao
3	2018/03/12	Multimedia Basics (II)	Wen-Hung Liao
4	2018/03/19	Visual Content Processing & Coding (I)	Chia-Wen Lin @ NTHU
5	2018/03/26	Visual Content Processing & Coding (II)	Chia-Wen Lin @ NTHU
6	2018/04/02	Image/Video Coding Standards	Chia-Wen Lin @ NTHU
7	2018/04/09	Audio/Music Analysis in Multimedia (I)	Yi-Hsuan Yang
8	2018/04/16	Audio/Music Analysis in Multimedia (II)	Yi-Hsuan Yang
9	2018/04/23	Midterm Exam	-----
10	2018/04/30	Final-Project Proposal Presentation Machine Learning in Social Multimedia Analytics	Wen-Huang Cheng
11	2018/05/07	Social Multimedia Applications	Wen-Huang Cheng
12	2018/05/14	Multimedia Recommendation	Yi-Hsuan Yang
13	2018/05/21	Advanced Multimedia Processing (I)	Hwann-Tzong Chen @ NTHU
14	2018/05/28	Advanced Multimedia Processing (II)	Hwann-Tzong Chen @ NTHU
15	2018/06/04	Advanced Multimedia Processing (III)	Hwann-Tzong Chen @ NTHU
16	2018/06/11	Polishing Up your Demo_No Class	
17	2018/06/??	Final Project Demo and Presentation	