Multimedia in Social Networks (MM)

Place: Room 108, Old Building, IIS, AS / Delta Building 601, NTHU
Time: Tue, 09:00-12:00

Course Teachers:
Dr. Yi-Hsuan Yang / Chair (CITI) Dr. Wen-Hung Liao (NCCU)
Dr. Yen-Yu Lin (CITI) Dr. Chia-Wen Lin (NTHU)
Dr. Jun-Cheng Chen (CITI)

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. Audio/Music Analysis in Multimedia
   5.1. Introduction to music information research
   5.2. Short-Time Fourier Transform
   5.3. Nonnegative matrix factorization and its application to audio signal analysis
6. Fundaments of Deep Learning
   6.1. Introduction to Deep learning
   6.2. Deep Learning Basics
7. Social Multimedia Analytics
   7.1. Sentiment, Opinion, Locations, and Multimedia
   7.2. Search and Recommendation in Social Media
   7.3. User Understanding
   7.4. Using Social Multimedia for Prediction and Forecast
8. CNNs for Computer Vision Applications
   8.1. Convolutional neural networks
   8.2. Representative CNN models
   8.3. CNN-based computer vision applications

Textbook/Reference:
11. Selected research papers.

Office hours: by appointment
Grades:
- Exam and Assignment (50%)
- Final Project (50%)  Proposal: 10%  Demo: 30%  Report (in IEEE Format): 10%

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<tr>
<th>Week</th>
<th>Date</th>
<th>Topics/Brief Description</th>
<th>Lecturers</th>
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<tr>
<td>1</td>
<td>2019/02/19</td>
<td>Introduction to Multimedia</td>
<td>Yi-Hsuan Yang</td>
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<td>2</td>
<td>2019/02/26</td>
<td>Multimedia Basics (I)</td>
<td>Wen-Hung Liao</td>
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<td>Li Su</td>
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<td>Audio/Music Analysis in Multimedia (II)</td>
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<td>Project Proposal Presentation</td>
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<td>Fundamentals of Deep Learning</td>
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<td>Exam</td>
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<td>19</td>
<td>2019/06/25</td>
<td>Final Project Demo and Presentation</td>
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