Multimedia in Social Networks (MM)

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

Time: Tue, 09:00-12:00

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

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:
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%

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics/Brief Description</th>
<th>Lecturers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2019/02/19</td>
<td>Introduction to Multimedia</td>
<td>Yi-Hsuan Yang</td>
</tr>
<tr>
<td>2</td>
<td>2019/02/26</td>
<td>Multimedia Basics (I)</td>
<td>Wen-Hung Liao</td>
</tr>
<tr>
<td>3</td>
<td>2019/03/05</td>
<td>Multimedia Basics (II)</td>
<td>Wen-Hung Liao</td>
</tr>
<tr>
<td>4</td>
<td>2019/03/12</td>
<td>Visual Content Processing &amp; Coding (I)</td>
<td>Chia-Wen Lin @ Delta 601, NTHU</td>
</tr>
<tr>
<td>5</td>
<td>2019/03/19</td>
<td>Visual Content Processing &amp; Coding (II)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2019/03/26</td>
<td>Image/Video Coding Standards</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2019/04/02</td>
<td>Audio/Music Analysis in Multimedia (I)</td>
<td>Li Su</td>
</tr>
<tr>
<td>8</td>
<td>2019/04/09</td>
<td>Audio/Music Analysis in Multimedia (II)</td>
<td>Li Su</td>
</tr>
<tr>
<td>9</td>
<td>2019/04/16</td>
<td>Project Proposal Preparation</td>
<td>No_Class</td>
</tr>
<tr>
<td>10</td>
<td>2019/04/23</td>
<td>Project Proposal Presentation</td>
<td>Yi-Hsuan Yang</td>
</tr>
<tr>
<td>11</td>
<td>2019/04/30</td>
<td>Fundamentals of Deep Learning (I)</td>
<td>Jun-Cheng Chen</td>
</tr>
<tr>
<td>12</td>
<td>2019/05/07</td>
<td>Fundamentals of Deep Learning (II)</td>
<td>Jun-Cheng Chen</td>
</tr>
<tr>
<td>13</td>
<td>2019/05/14</td>
<td>Exam</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2019/05/21</td>
<td>Social Multimedia Applications</td>
<td>Jun-Cheng Chen</td>
</tr>
<tr>
<td>15</td>
<td>2019/05/28</td>
<td>Deep Learning for Computer Vision Applications (I)</td>
<td>Yen-Yu Lin</td>
</tr>
<tr>
<td>16</td>
<td>2019/06/04</td>
<td>Deep Learning for Computer Vision Applications (II)</td>
<td>Yen-Yu Lin</td>
</tr>
<tr>
<td>17</td>
<td>2019/06/11</td>
<td>Deep Learning for Computer Vision Applications (III)</td>
<td>Yen-Yu Lin</td>
</tr>
<tr>
<td>18</td>
<td>2019/06/18</td>
<td>Project Preparation</td>
<td>No Class</td>
</tr>
<tr>
<td>19</td>
<td>2019/06/25</td>
<td>Final Project Demo and Presentation</td>
<td>MM Faculty</td>
</tr>
</tbody>
</table>