CS 537 - Fall 2021 – Advanced Topics in Internet of Things

Reading List

1. Week - August 24 – August 26 (Introduction to IoT)

August 24: Introduction to Course and IoT Space (presented by Klara Nahrstedt)

August 26: IoT Devices and IoT Data Formats (presented by Klara Nahrstedt)

2. Week – August 31 – September 2 (Images-Video Formats)

August 31: Human Vision System and Image Formats (presented by Klara Nahrstedt)

September 2: Video Formats and Basic Coding (presented by Klara Nahrstedt)

3. Week – September 7 – September 9 (Image and Video Coding)

September 7: Basic Image Coding (JPEG, JPEG-2000) (presented by Klara Nahrstedt)

September 9: Video Coding (MPEG, MPEG-4, H.264) (presented by Klara Nahrstedt)

(Good Overview: Gong, Mao, “An overview of Emerging Video Coding Standards”, ACM SIGMOBILE Mobile Computing and Communications Reviews (GetMobile), December 2018, Vol.22, Issue 4)

4. Week – September 14 – September 16 (Video and Audio Coding)

September 14: Video Coding (HEVC and Beyond) (presented by Klara Nahrstedt)

September 16: Auditory System and Audio Coding (presented by Klara Nahrstedt)
5. Week – September 21 – September 23 (IoT Analytics)

**September 21:** Overview of IoT Analytics Algorithms (*presented by Klara Nahrstedt*)

**September 23:** IoT Analytics (*presented by Students*)


6. Week – September 28 – September 30 (IoT Analytics)

**September 28:** IoT Analytics (*presented by Students*)

- Carlos Ruiz, Shijia Pan, Adeola Bannis, Ming-Po Chang, Hae Young Noh, and Pei Zhang, “IDIoT: Towards Ubiquitous Identification of IoT Devices through Visual and Inertial Orientation Matching During Human Activity”, ACM/IEEE IOTDI 2020

**September 30:** IoT Analytics (*presented by Students*)

7. **Week - October 5 – October 7 (IoT Systems)**

**October 5: IoT Systems – Reliability (presented by students)**

- Mbarka Soualhia; Chunyan Fu; Foutse Khomh, “Infrastructure Fault Detection and Prediction in Edge Cloud Environments”, ACM SEC 2019
- Sumukh Marathe, Akshay Nambi, Manohar Swaminathan; Ronak Sutaria, “CurrentSense: A novel approach for fault and drift detection in environmental IoT sensors”, ACM/IEEE IOTDI 2021

**October 7: IoT Systems – Video on the Edge Computing (presented by students)**

- Xian Shuai; Yulin Shen; Yi Tang, Shuyao Shi; Luping Ji; Guoliang Xing, “milliEye: A Lightweight mmWave Radar and Camera Fusion System for Robust Object Detection”, ACM/IEEE IOTDI 2021

8. **Week – October 12 – October 14 (IoT Systems)**

**October 12: IoT Systems (presented by Students)**

- Adam Hall, Umakishore Ramachandran, “An Execution Model for Serverless Functions at the Edge”, ACM/IEEE IOTDI 2019

**October 14: IoT Systems and Resource Management (presented by students)**

9. Week – October 19 – October 21 (IoT Networks & TAKE-HOME EXAM)

**October 19: Multimedia Networking** *(presented by Klara Nahrstedt)*

**October 21: NO CLASS** (Take-Home Exam, posted October 18 (Monday, 11:59pm), due October 25 (Monday, 11:59pm))

10. Week - October 26 – October 28 (IoT Networks)

**October 26: IoT Networks** *(presented by Students)*


**October 28: Video Networks** *(presented by Students)*

- Guan et al., “Pano: Optimizing 360 Video Streaming with better understanding of quality perception”, ACM SIGCOMM 2019, Beijing, China, August 2019

11. Week – November 2 – November 4 (IoT Privacy/Security and Apps)

**November 2: IoT Privacy/Security** *(presented by students)*

- Panagiotis Chatzigiannis, Foteini Baldimtsi; Constantinos Kolias; Angelos Stavrou, “Black-Box IoT: Authentication and Distributed Storage of IoT Data from Constrained Sensors”, ACM/IEEE IoTDI 2021

**November 5: IoT Applications – Industry IoT** *(presented by students)*
12. Week – November 9 – November 11 (IoT Apps)

November 10: IoT Applications – IoT Buildings (presented by Students)


November 12: IoT Applications – Multi-Modal Applications (presented by students)


13. Week – November 16 – November 18 (Visualization and Quality of Experience)

November 16: IoT and Augmented Reality (presented by Students)

- Zida Liu, Guohao Lan; Jovan Stojkovic; Yunfan Zhang; Carlee Joe-Wong; Maria Gorlatova, “CollabAR: Edge-assisted Collaborative Image Recognition for Mobile Augmented Reality”, ACM IPSN (International Conference on Information Processing in Sensor Networks) 2020
- Yong Li, Wei Gao, “DeltaVR: Achieving High-Performance Mobile VR Dynamics through Pixel Reuse”, ACM IPSN 2019
November 18: QoE in Video 360 (presented by students)


14. Week – November 23 – November 25 (THANKSGIVING BREAK)

15. Week – November 30 – December 2 (Final Project Presentations)

November 30: Final Project Presentations (presented by students)

December 2: Final Project Presentations (presented by students)

16. Week – December 7-December 9 (Final Project Presentations)

December 7: Final Project Presentations (presented by students)
December 9: End of Semester (Reading Day)

17. Week – December 15 – December 17 (Final Exams)

December 16: Final Project Report Due December 15 (Wednesday), 11:59pm