CmpE 585: Special topics in CMPE - Internet of Things
Fall 2021

Instructor: Arda Yurdakul (yurdakul at boun)

Time: MMM345 (via Zoom)

Catalog Definition:

IoT Architecture. Sensing/Acting. Connectivity: technology, protocols. Processing. Interoperability. Scalability. Security. Privacy. Case Studies.

Motivation

Internet of Things (IoT) has started to shape our lives. Current trends in IoT show that there will be around 500 billion devices by the end of 2030. Most of these devices will be smart sensors with the goal of creating healthier and better living environments. Cisco estimates that the amount of data generated by IoT devices will reach 600 ZB per year by the end of 2020, while most of this data will be processed by these devices and stations that are pretty close to these devices. Yet, it will still be a problem how this data can be stored and handled properly by keeping the user's privacy without violating its security.

The course will cover paper evaluations, comparative analysis, discussions, brainstorming and writing.

Tentative Course Outline:

• Overview of IoT: Concepts. Characteristics and requirements. IoT reference model. Applications.
• "Things" in IoT: Devices. Real-time. Power efficiency.
• Communication: Technologies and protocols. Interoperability.
• Edge Computing: Relation with the Cloud. Resource Management.
• Data: Acquisition. Abstraction. Processing. Intelligence.
• Security: Attack types. Countermeasures. IoT botnets.
• Privacy: GDPR, privacy enhancing technologies, trust
• Blockchain for scalability, privacy and security in IoT.

Prerequisites:

The attendants are expected to have a background or be an active student in a course in at least one of the following areas: embedded systems, computer networks, machine learning, blockchain, security. For registration, a consent-request message is required. In the message, background, list of related courses and motivation need to be provided.

Grading:

Homeworks: 40 pts (for each submission, late is penalized by 20% per day (including weekends))
Active attendance: 30 pts
Paper Evaluations: 30 pts (for each submission, late is penalized by 100% per minute)