CmpE 585: Special topics in CMPE - Internet of Things
Fall 2020

Instructor: Arda Yurdakul (yurdakul at boun)

Time: TTT567 (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.

In this course, after shortly studying the basics of IoT, we will look at IoT from an academic perspective. The course will cover paper evaluations, comparative analysis, discussions, brainstorming and writing. A final project will be implemented to demonstrate an idea or a fact.

Tentative Course Outline:

- Basics of IoT
  - IoT architecture
  - IoT components
  - Communication technologies and protocols
- Research Trends in IoT
  - Efficient computing in IoT: Edge computing and its variations
  - Smart sensors and gateways: deep learning at the edge.
  - Security: attack types, countermeasures, IoT botnets
  - Privacy: GDPR, privacy enhancing technologies, trust
  - Blockchain for scalability, privacy and security in IoT.
  - Interoperability: multiple protocols, standardization, container-based approaches

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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: 30%
In-class activities: 40%
Project: 30%