Research Report
Requested by Prof. Mahmoud El-Hadidi
For Course: ELC4015- Selected Topics in Communications - Internet of Things
Fall Semester of Academic year: 2024/2025

Objective:

Understand and consolidate basic knowledge about Internet of Things (IoT).

Required Activities:

Activity 1 - **Search the Internet (or other resources for knowledge)** to find a document for a case study of an IoT application that has been "actually" implemented. The **"obtained document"** for the case study should have sufficient details to cover the following information:

1 - Specific Name of IoT Application (e.g. IoT Deployment in Self Driving Vehicles : Tesla Cars as an Example)
2 - Specific Date for Case Study Implementation (e.g. Case Study was fully completed and deployed in 16 May 2016).
Caution: Date of publication of the "obtained document" is NOT the Date for Case Study Implementation
3 - Name of IoT Vertical Application (e.g. Intelligent Transportation System)
4 - Specific Functions Performed by IoT in the Case Study
5 - Detailed Schematic Diagram for the IoT Application (showing Location & Topology of IoT Nodes, Location of Gateway, Internet Connectivity, Cloud Connectivity, Man-Machine Interface, Type/Model of IoT Nodes, Type/Model of Gateway, Location of IoT Application Software, … , etc)
6 - Details of Wireless Communication Protocol/Standard used for Communication between IoT Nodes
7 - Details of Wireless Communication Protocol/Standard used for Interconnecting IoT Nodes to the Internet
8 - Routing Protocol Deployed (if any)
9 - IoT Architecture for the Specific Case Study
10 - Power Requirements for the Transmitters & Receivers of the IoT Nodes
11 - Maximum Distance Coverage in the IoT Application
12 - Security Features/Capabilities Built Into the IoT Application (if any)

Remark 1:

You can always communicate with the authors of the **"obtained document"** to ask for additional information, in case not all items above are covered in the document.

Remark 2:

Some students may think of using "Regenerative AI Software" to "do the work for them". This is NOT ENCOURAGED, for the following reasons:

i) Student will NOT learn the skill of how to search the Internet to get a useful document that covers a desired topic.
ii) Student will NOT learn the skill of how to read a technical paper, understand its contents and extract specific knowledge/data from it (as requested in the 12-points above).
iii) Student will NOT learn the skill of how to write a technical report, organize its content, provide references, present drawings/diagrams/tables and summarize conclusions.
iv) Student will NOT get a GOOD grade !!!

Activity 2 - Read the "obtained document", understand its content and then **prepare your "own" Research Report** that covers the 12 points above.

Remark 3: Each student should prepare his/her own Research Report (no team work).
Remark 4: Research Report size should be between 15 and 30 pages.
Remark 5: As much as you can rely on drawings, figures, tables, and diagrams. Make text as minimum as you can. ALL drawings, figures, tables and diagrams should have captions preceded by numbers. Text inside Research Report should refer to these numbers. References from which these information are taken should appear in the caption.
Remark 6: "Copy & Paste" of text from original documents is NOT allowed. To do so is called "Plagiarism", which is prohibited.
Remark 7: You may "Copy & Paste" figures or tables - on the condition that - you clearly cite the source of the figures or tables.
Remark 8: ANY information inside the Research Report should make reference to the original source, using "Reference Numbers". A "List of References" should appear at the end of the Research Report.
Remark 9: The format of the Research Report is as follows:
* Title Page (containing: Name of Dept/Faculty/University - Name of Course & Its instructor - Title of IoT Application covered in Report - Name of Student - Day/Month/Year of Report Submission)
* Table of Contents
* Summary (One Page or less)
* Body (the 12 points from 1- to 12 - above)
* List of References

Activity 3 - **Send "Initial Draft" of your Research Report** - in a .pdf format - as an E-Mail Attachment to me in TWO WEEKS time (23 October 2024), at the following E-Mail address:
mahmoud.hadidi@cu.edu.eg
You should **also send an Electronic Copy of the "obtained document"** - used as basis for the Research Report, at the same E-Mail address.

You will receive my comments on your Research Report within ONE WEEK, in the form of a "marked" .pdf document.

Activity 4 - **Modify/revise your Research Report** within ONE WEEK from date of receiving the "marked" .pdf document. Again, your "final" Research Report should be in .pdf format, and **should be sent as an E-Mail attachment** to my E-mail address.

Important Dates:

9 October 2024; Start work on Research Assignment
23 October 2024: Send “Initial Draft” of Research Report
30 October - 6 November 2024 (ONE WEEK following date of receiving “Marked” .pdf): Send “Final” Research Report

General Remarks:

GR1 - Research Report will get up to 10 marks, depending on proper coverage of 12 points listed above and proper formatting.
GR2 - “Copy & Paste” will invalidate the “Research Report”
GR3 - Similar Research Reports will get a “scaled down” mark that is equal to: “Research Report” Mark “divided by” # of Similar Copies