Case Study Assignment for Students in ECE 5984

Introduction

In this assignment, you will work with a partner on a two-student team to:

- Select a suitable topic for a case study of an IoT system, application, and/or design;
- Submit a proposal for possible feedback and approval by the instructor that specifies the topic and references to be used;
- Conduct research on the topic of your case study relying on the specified references and, perhaps, additional references;
- Prepare a one-page abstract of the case student with references, two review questions with solutions, and an 8-minute presentation on the use case; and
- Present the use case in class within eight minutes and allowing an additional two minutes to answer any questions from other students and/or the instructor.

Case Study Topic Selection

Each team should select a topic for their case study that is a production, prototype, or research deployment of an IoT system or that is a specific IoT application or design that has been implemented in production, as a prototype, or as a research project. The topic may be in any application domain such as smart cities, smart campus, smart home, smart farm, environment, manufacturing, healthcare, eldercare, social interaction, safety and security, art and performance, etc.

The topic should be based on one or more references that describe the topic in depth. The primary reference should be in a reputable publication such as the *IEEE Internet of Things Magazine*, the *IEEE Internet of Things Journal*, or the conference proceedings of the IEEE World Forum on Internet of Things.[1] These and other suitable sources can be found on IEEE Xplore (https://ieeexplore.ieee.org/). Other references should be used for additional details about the system, application, or design or about technologies used in the system.

You will want to select a topic that allows you to discuss multiple aspects of the deployment, application, and/or design including at least three of the following features.

- Motivation for and/or problem addressed by the system, application, or design
- Technologies used, such as communications, processing, cloud and edge computing, sensors, and actuators
- Design tradeoffs
- Security and/or privacy
- Outcomes, such as success or failure, and the reasons for the outcomes

Case Study Proposal Submission

You and your partner must first join the same group at the class Canvas site.[2] After you have joined the same group, you and your partner must each submit a proposal by the specified due date using the

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[1] This is *not* an exhaustive list of suitable primary sources.
[2] The instructor will work with the class to find a solution if there is an odd number of students in ECE 5984.

"Case Study Proposal" assignment at the class Canvas site. The proposal requires submission of the following information in a Canvas "quiz."

- The name and email address of your partner
- The proposed subject of your case study
- At least two references that you will use for the assignment

Case Study Materials Submission

You must prepare the following items and submit them in the "Case Study Materials" assignment at the class Canvas site. Submit a single zip file as described below.

- **A one-page abstract of your case study.** The document should include a list of all references used in your research for the abstract and presentation, but the reference list does not need to be included in the one-page limit. The title of the case study and the names and email addresses of the team members should be at the top of the abstract and are included in the one-page limit. Text should use a common 11-point font, single-spaced, with one-inch margins. You will be graded on the content of the abstract, not on whether or not it uses all of the one-page limit. The abstract must be submitted as a single PDF or Word document.

- **A presentation on your case study.** The presentation should include a title slide with title and team members names and email addresses, at least one graphical representation of the topic, a single summary slide, and a final slide providing a list of references (repeated from the abstract). The presentation should cover multiple key aspects of the case study as described above in the section on "Case Study Topic Selection." Presentations are expected to include at least 8 slides total and no more than 12 slides total and must be able to be presented in 8 minutes without rushing. The presentation must be submitted as a single PDF or PowerPoint document.

- **Two short-answers questions with solutions on important aspects of your case study that are covered in the presentation.** The list of references does not need to be presented. The questions and solutions must be submitted as a single PDF, text, or Word document.

Note that all three files are to be combined into a single zip file for submission.

Case Study In-Class Presentation

Each team will present their case study in class, using the submitted presentation and incorporating any feedback from the instructor. The presentation should take eight minutes. An additional two minutes will be available for questions from students and/or the instructor. Both team members must participate fully in the presentation. Check announcements in Canvas concerning signing up for a presentation time.

There is no submission on Canvas for this part of the assignment.

Grading

This assignment has a total point value of 50 which is distributed as follows.

- **Case Study Proposal – 5 points.** Both team members must submit a complete proposal by the due date.

- **Case Study Material – 30 points.** Case study material will be assessed on technical depth, clarity, and readability of the abstract and submitted presentation file as well as the suitability of the two review questions and solutions. Make only one submission per team.

- **Case Study Presentation – 15 points.** The case study presentation will be assessed based on the technical depth and clarity of the presentation, participation by both team members, and responses to questions. Make only one submission per team.

Honor System Expectations

All work on this assignment must be your own and your team partner's. You are encouraged to ask questions about the assignment and provide responses to such questions using the "Case Study" topic in the Discussions section of the class Canvas site. **You are not to collaborate with anyone except your team partner on the actual research or creation of materials that are submitted. Collaboration with anyone except your team partner or any use of generative AI (such as ChatGPT, Gemini, or Copilot) without citation are violations of Virginia Tech's Graduate Honor Code.** Please review the section on "Graduate Academic Integrity" in the course syllabus available on the class Canvas site before you begin work on this project.