TiSF S'23 Unit 3 Project

Summary

As mentioned in the course description, Unit 3 will focus on being able to understand the behavior of a large system and how we can apply the transition systems approach and extend it for problems related to large system modeling.

In this project, you have to select a commercial system (from the list provided) and understand it as a system of systems (SoS). You have to capture your understanding in a technical report that you will submit as your final deliverable for the project.

Details

A SoS can be understood in terms of the overall behavior, as well as in terms of its component systems and their interconnections. In this project, you need to capture your understanding in two ways:

1. Model individual systems and the interconnects using transition systems vocabulary.
2. Model individual systems using UML. Select suitable UML diagram types to capture the structure, functionality, and behavior of each system.

Your final submission includes a tech report (PDF), a deck (PDF), and a hosted video link (URL):

1. Tech report presents your understanding of the system, its architecture, and your modeling of the systems involved - in TS and in UML. Use the ACM conference paper template. The report should be no more than 5 pages excluding references. Use the outline provided below.
2. ~~A live presentation (10 min presentation + 5 min Q&A) to outline the key contributions of your tech report (think of it as a presentation at a conference which has accepted your paper).~~
3. A recorded video presentation (15-20 min) that includes the following
    a. A demo of the application you chose,
    b. Key contributions of your tech report
    c. Brief description of the high level SoS model and the various component systems
    d. Details of the models you created for these systems and any interesting/unique features of your models
4. **Submit the deck you use for your recorded video presentation.**

Tech report outline

1. Abstract
2. Overview of the system being analyzed (we will call this system of systems - SoS)
3. Persona and use cases for the SoS
4. Behavioral model of the SoS (to capture the requirements)*
5. List of component systems of the SoS and a brief about the functionality of each of them (text and pictures)
6. Diagrammatic representation of SoS in terms of component systems and interconnections (the way we describe systems in class using boxes and arrows).
7. Model each component as a system, focusing on the structure and the dynamics using Transition Systems and extensions discussed in the class that are applicable. Introduce new extensions as needed.
8. Describe the interconnections within the SoS using transition systems vocabulary.
9. Model each component system and overall SoS using UML
10. Present a comparison between the two approaches of modeling (UML and Transition Systems), identifying pros and cons of each.
11. If you extended the transition systems vocabulary to model your system, list down the extensions, what purpose did you use them for, and why couldn't you use something existing.

Deadlines

Deliverable	**Date**	**Comments**
Tech report draft	Apr 17 (Monday)	Create the outline of the paper, including understanding of the overall system and one small system model at least.
~~Final presentation~~	~~May 4 (Thursday)~~	~~Slots for presentations will be published later. This will be in-person, please plan accordingly.~~
Final submissions	May 5 (Friday)	Report PDF, Deck PDF, and Video presentation link