Project 1 – Problem Understanding and UI Design

Presentation due: Thursday 15 October 2009

Professor Ho-Jin Choi Report due: Saturday 17 October 2009

Project Description

In Projects 1 and 2 of this course, each team is required to understand and design a fault protection system for a spacecraft as described in the article by Steve Easterbrook et al. [Eas98]. (That is, you should treat this article as your clients and read carefully in order to understand the requirements of the system, rather than the arguments the authors are making.) Project 1 concerns on understanding the problem (i.e., the requirements), and Project 2 concerns on designing the system.

Project 1 is generally about problem understanding and user interface design. More specifically, each team is expected to use two different methods for problem understanding, namely use-case modeling and problem frame analysis, in order to get hands-on experience of the two methods and appreciate the difference. In addition, you are also expected to identify non-functional requirements (or quality attributes) of the system in due course, and consider the usability issues for designing the user interface of the system.

When performing use-case modeling and problem frame analysis, you should try to analyze the requirements as exactly described in [Eas98] as possible. When identifying non-functional requirements, however, you may improvise and add more quality attributes that you believe are essential to the system in question. (Enriching the set of non-functional requirements and giving them priority will help you design the architecture of the system in Project 2.) As for the user interface design, provide one or two screen shots (sketches) of your design and discuss usability issues in relation to some (at least three) of the usability scenarios introduced in [BJK01].

Project Presentation (In the class on Thursday, October 15)

Each team should give a 15-min MOSP (middle of semester presentation) on Project 1 in the class on 15th October. The presentation should be prepared in PowerPoint, and should contain the revised versions of the models presented in OP2 and OP3. It should also include the description of non-functional requirements and the preliminary user interface design.

Project Report (Due: Saturday, October 17)

The project report is a 15-20 page document (in MS Word), and should contain the following:

1. Problem understanding
   - Business case and system context
   - Problem frames
2. Functional requirements (using use-case model)
   - Use-case diagram(s)
   - Description of actors
   - Use-case specification (for each use-case)
3. Non-functional requirements
   - Quality attributes identified from [Eas98]
   - Quality attributes improvised by the team
4. Usability analysis and design
   - Preliminary user interface design
   - Discussion on usability scenarios

References

[BJK01] Len Bass, Bonnie John, Jesse Kates, *Achieving Usability Through Software Architecture*, Technical Report CMU/SEI-2001-TR-005, Carnegie Mellon Software Engineering Institute, March 2001.

[Eas98] Steve Easterbrook, and et al., "Experiences Using Lightweight Formal Methods for Requirements Modeling," *IEEE Transactions on Software Engineering, Vol. 24, No. 1*, January 1998.

[Jac01] Michael Jackson, *Problem Frames: Analysing and Structuring Software Development Problems*, Addison-Wesley, 2001.