CIS 441 & 541: Embedded Software for Life-Critical Applications

Cloud-based Smart Pacemaker Challenge Project

Milestone 3: Validation and Assurance Cases

Due: TBD

In this milestone, you will report what you have achieved by filing a final project report followed by a group presentation.

In the **project report**, at least the following items should be included.

1. A review of the project roadmap: what your final models look like, what properties you verified, what software/hardware platforms you used for implementation, explanations of the overall structure of your code, instructions to get your program running, what experiments you did to validate the correctness of your implementation, and analysis of experiment result.

2. A comprehensive assurance case analysis of correctness of your project. Presentation style of your assurance cases analysis should follow examples from lecture slides and documents available from course website. You need to explicitly identify what the top claim is, what the subclaims are, under what context they hold, which strategies and/or you would use to ensure your claims, etc. For more details, you need to refer to the slides and documents that covers the assurance cases analysis. This should have two parts: assurance case and confidence case/argument.

3. Member contributions to the project.

The presentation will be held on December 13, venue TBA.

1. In the presentation, you'll show a demo of how your program runs, explaining what the observations of the board output mean (as heart behaviors and pacemaker controller reactions).

2. You'll then present your assurance cases analysis to the class, convincing that your approach finally gives trustworthy implementations of the pacemaker controller.

3. Questions and answers session will then follow.

Your final grade is assessed based upon the following items:

1. The design model (15%)

2. Correctness properties (15%)
3. Verification result of the properties against the model (10%)
4. Implementation code (25%)
5. Using assurance cases to argue the correctness of your design/implementation (25%)
6. Member contributions to the project (5%)
7. In class demonstration/presentation (5%)
8. Extra credit for additional features.

To submit your work, zip your report, the presentation slides, the project code/hex files if you have made changes from the submission of Milestone 3, and submit via Canvas.