Hands-on Project
CSC 8350 Advanced Software Engineering
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Description:
Each student is required to form a two-member group to work on a software engineering hands-on project (Note: the hands-on project group and the literature review group may be different). The hands-on project must belong to one of the following two types:

1. A modeling project based on DEVS using DEVSJAVA (or other software modeling tools if approved by the instructor).
2. A project based on cutting-edge tools related to software engineering, such as program analysis tools, automated software test tools, extreme programming tools or supporting tools, and other cutting-edge tools.

For the type 1 projects, the projects will use the Discrete Event System Specification (DEVS) formalism and the DEVSJAVA environment. Each group will define a problem in one of the topical areas listed below and specify the goal of its modeling and simulation study (using the car wash center as an example, the goal could be studying how the different number of car wash centers can impact the service time of vehicles). Students may also choose their own topic areas (e.g., related to their Master or Ph.D. thesis) after discussing with and granted by the instructor. In the project, students will develop models and run simulations in DEVSJAVA, collect simulation results and conduct preliminary analysis of the results.

Suggested Topical Areas:
- Wired or wireless network modeling and simulation
- Health care system modeling and simulation
- Smart home/smart grid modeling and simulation
- Business (workflow) process modeling and simulation

For the type 2 hands-on projects, the projects cannot be based on the existing examples provided by the tools. You need to develop your own project or examples. It is desirable (although not required) for the projects to be “extended” from the advanced topic review (but keep in mind that a hands-on project needs to be a concrete project instead of a review).

Note: if your advanced topic review is a learning-oriented project and you choose to do your hands-on project based on your advanced topic review, you’ll need to justify why your hands-on project is not an overlap with your advanced topic review project (because your advanced topic review project needs to show some tools/examples too). This is not an issue for research-oriented review project because the review project focuses on research while the hand-on project focuses on specific tools and examples.

Each group needs to finish a project report and give a 13-minute presentation and demonstration at the end of the semester. For type 1 project, the project report should include descriptions of the problem, the developed models (including diagrams and some pseudo code), simulation results (including snapshots of the simulation, and some preliminary analysis of the results), and a conclusion section. For type 2 project, the project report should include an introduction, a section describing the tool or methodology used, a section describing the examples developed, a result/outcome section, and a reflection/discussion/conclusion section. The reflection/discussion/conclusion section is an important section, which should describe what have been learned, and/or discussion and evaluation of the tools that are used. For example, if your project is to develop an example based on a tool or method, you need to put more emphasis on the
software engineering aspect (e.g., evaluation of the development tool/method) instead of simply developing the example.

The project report will be 9-10 pages (Times New Roman, 12 font size, single space, and single column) excluding the cover pages.

**Guidelines and Requirement for presentation**

For Type 1 projects:
- Problem statement and background
- Modeling and simulation goals (using the car wash center as an example, the goal could be studying how the different number of car wash centers can impact the service time of vehicles)
- Overview and description of your model (how does the DEVS model work)
- Demo
- Experiment Design, Experiment Results and analysis
- Conclusion & discussions

For Type 2 projects:
- Topic and background
- Purpose of the tool(s) (what it does)
- The theory/methodology/foundation for the tool(s)
- Overview and description of your demo example
- How it is different from your learning-oriented review project (required if it is based on your learn-oriented review project)
- Demo
- Reflection & discussions