Syllabus

CS527 (Topics in Software Engineering) is a topics course whose content varies from one offering to another.

In Fall 2011, the topics will be on dynamic and static program analysis for finding software errors, with an emphasis on systematic software testing, especially for concurrent code. A 2002 NIST report estimates that software errors cost the U.S. economy $59.5 billion annually and that improving testing infrastructure could save $22.2 billion. We will discuss a number of techniques and tools that could reduce this cost. The focus will be on analysis of code, but we will also cover analysis of software models and their use in testing.

Similar courses were offered in Fall 2010, Fall 2008, Fall 2007, Fall 2005, and Spring 2005.

Course Organization

Students will get familiar with the technical results as well as with the process of doing research in software testing and analysis. The aim is to involve students in projects in this field. For students who choose to work on research projects, the aim is to help students start research in this field or apply its results in their ongoing research projects. For students who choose to work on more engineering-oriented projects (e.g., some I2CS students), the aim is to have them try out some latest techniques and tools from research. The course readings will include classic papers and current state-of-the-art work. Students will read papers ahead of time, write reports on papers, participate in discussions, present at least once during the course, and do a project in small teams or individually. Students will also write a paper describing their project and present their work at the end of the course. There will be one or two homework assignments to help students with the projects.

Prerequisites

Students should have basic knowledge of software engineering and programming languages. If you are not sure whether you can attend this course, please consult the instructor (NetID: marinov).

Grading

Grades will be based on project, presentation, participation (reports and discussion), and homework assignment(s). Grades will be A- centered, but there is no guarantee for A (or even a passing grade).

Homework

Please use your @illinois.edu email addresses for all course communication. Note that you don't have to use the CITGES email web interface but can use other clients, e.g., here are some instructions for setting up GMail to use @illinois.edu address.

Paper Reports

Once students start presenting papers, there can be two or more papers discussed per meeting. If so, each student need to read only one paper and to write only one report. You can choose any of the papers listed for that meeting. Moreover, if you are presenting in a given meeting (or week), you need not write a report for any of the other papers.

Students should write reports for papers to be discussed in class. Unless specified otherwise, all paper reports are due before the beginning of the respective class (2pm CST) and should address the following questions:

1. Choose one good point in either problem, solution, or evaluation and describe why you find it good. (Is the problem important? Is the solution interesting? Is the evaluation convincing?)
2. Choose one bad point in either problem, solution, or evaluation and describe why you find it bad. (Is the problem unimportant? Is the solution trivial? Is the evaluation weak?)
3. List one question for discussion. (If you send this well before the meeting, your question may appear on the slides. On-campus students may be asked to discuss their questions in class. Off-campus students may be asked to discuss their questions on the mailing list.)
4. [Only before students start presenting papers] Describe one potential project based on this work. (Can the same problem have a different solution? Can the same solution be applied to a different problem? Would a bigger evaluation be appropriate?)

Handing in Reports

Reports should be emailed to both the presenter AND Darko (NetID: marinov) with "cs527 HW <date>" in the subject line (e.g., "cs527 HW 9/29") and the report inlined NOT attached (preferably as ASCII text). Report policies:
• Students are welcome to discuss the papers even before writing the report, but reports should be written individually. CS527 uses the standard code for CS courses.
• Reports are due by lecture time: 2:00pm CST. If you submit by 12:30 your questions/comments may be discussed during the lecture.
• You can’t have any report late; if you need an extension, ask in advance, and you may be assigned a make-up paper.
• You can omit up to two reports; please inform us if you plan on omitting a report.

Homework Assignments

HW0: Difficulties in Your Software Development

Homework assignments will not be accepted late without special permission.