Software Reliability and Testing

Summer semester 2013/2014

Introduction to the course

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Goal

- Testing: provide basic knowledge of testing techniques and promote a vision of software testing and reliability analysis in symbiosis with software development.
- Testing: practice with some of those techniques (e.g., Test Driven Development) .

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- Testing: provide basic knowledge of testing techniques and promote a vision of software testing and reliability analysis in symbiosis with software development.
- Testing: practice with some of those techniques (e.g., Test Driven Development) .
- Reliability: provide technical and mathematical instruments to assess and monitor the behavior of a system under use
- Reliability: mine (big) data to evaluate software reliability

Syllabus

Software testing

- Testing principles and practices
- Black and White Box Testing
- Type of Testing: Acceptance, Integration, Unit, Regression,
- Functional and System, Beta Testing
- Coverage Analysis
- Static Analysis of Software Systems
- System Testing
- Test Management While You Code: Test Driven Development

Syllabus

Software reliability

- Software quality and its sub-attributes
- What is a bug? Errors, defects, faults, failures, and bugs a chain of causality
- Software and hardware reliability
- Dynamic systems and Markov chains
- Modeling and predicting software reliability: statistical models
- Reliability over software evolution
- Defects and other software measures: associations

Learning outcome

Testing:

- Being able to select and apply testing techniques.
- Combining appropriate testing techniques to the development of a comprehensive test plan for the development of a reliable and secure system

Reliability:

- Being able to mine bug repositories, analyse data and predict reliability of software.
- Being able to discuss accuracy and prediction of reliability models across software versions.

Course structure

- Frontal lectures
- Lab: Exercises
- Lab: Exercises and Project (mine github)

Timetable

Lectures:

- Thursdays 10:30 -12:30 room D002
- Fridays 10:30-12:30 room D002

Labs:

- Fridays 14:00-16:00 room E431

Office hours:

- Thursdays 8:30 -10:30 POS 116

Exam

- The assessment is based on the assignments (50%) and the written exam (50%) to be done during the semester or all in one at the final exam.
- In the latter case, students are requested to hand in all assignments one week before the final exam date.
- To access to the written exam students must have passed (18 or more) the assignments' assessment.
- In case the assignments' assessment is positive but the final written exam is not positive the assignments grade is valid for all three regular exam sessions (July, October, February).
- There is a midterm (April 11, 10:30-12:30). The midterm counts for 50% of the final written exam.
- In case the midterm grade is positive (18 or greater), the grade is valid for all three regular exam sessions (July, October, February).