Syllabus

Software Testing – *Approaches and Technologies*

School of Data & Computer Science

Sun Yat-sen University

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Approaches & Technologies

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A. DESCRIPTION

- The Importance of STMT
  - Software testing knowledge is a crucial industry need: testing accounts for more than half the cost of developing software; developers spend 50% of their time testing; and reliability requirements are steadily increasing.
  - New and growing technology areas (web applications, embedded 嵌入试 software, secure systems, object-oriented software) require software that is tested more thoroughly.
  - 《2017年版中国软件测试现状调查报告》51Testing.com
- Prerequisite
  - No formal requirement, but it is recommended that students have basic knowledge of Discrete Mathematics, Software Engineering and Programming Languages like C, C++ or Java.

B. ORGANIZATION

- Lecture Time
  - 数媒
    - **Monday** 10:00-11:40, C202 (W1-W18)
    - **Wednesday** 14:20-16:00, C203 (W10-W18)
  - 计应
    - **Friday** 10:00-11:40, C104 (W1-W18)
    - **Wednesday** 10:00-11:40, C203 (W10-W18)
  - 电政
    - **Wednesday** 10:00-11:40, C203 (W1-W9)
    - **Friday** 14:20-16:00, C104 (W1-W18)
  - 嵌软+通软
    - **Monday** 14:20-16:00, C202 (W1-W18)
    - **Wednesday** 14:20-16:00, C203 (W1-W9)

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C. COURSE OBJECTIVES

- This course will provide an introduction to systematic and organized approaches to software testing. Students in this course will understand and appreciate the key concepts in software quality assurance, learn techniques and tools that could significantly improve their testing skills and importantly their development skills. Topics to be covered include SDLC, testing process, coverage criteria, automatic and manual generation of test inputs, execution of test cases, validation of test outputs, and defect management. This course should provide practical knowledge of a variety of ways to test software, an understanding of some of the tradeoffs between testing techniques, and a feel for the practice of software testing and the research in software testing.

- "… When you look at a big commercial software company like Microsoft, there's actually as much testing that goes in as development. We have as many testers as we have developers. Testers basically test all the time, and developers basically are involved in the testing process about half the time …".
  - Bill Gates

D. COURSE TOPICS

- 软件工程回顾 (5)
    - 软件与软件危机
    - 软件开发与软件工程
    - 软件生命周期模型
    - 软件质量模型
    - 敏捷开发

■ D. COURSE TOPICS

- ■ 软件测试的基本概念 (4)
    - ■ 软件缺陷
    - ■ 软件测试概述
    - ■ 软件测试的过程和方法
    - ■ 基于软件生命周期的软件测试方法
    - ■ 软件测试的分类与分级

■ D. COURSE TOPICS

■ 软件静态测试 (4)

■ 软件静态测试概述

■ 同行评审

■ 代码检查

■ 软件复杂性分析

■ 软件质量控制

■ 软件静态分析工具

D. COURSE TOPICS

- 软件动态测试-I (5)
    - 白盒测试
    - 黑盒测试
    - 灰盒测试
    - 测试用例设计
- 软件动态测试-II (2)
    - 单元测试
    - 集成测试
    - 确认测试
- 软件动态测试-III (2)
    - 系统测试
    - 动态测试工具

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D. COURSE TOPICS

- 软件安全性测试和软件安全测试 (1)
  - 软件安全性
  - 软件安全性测试
  - 软件安全
  - 软件安全测试
- 软件缺陷管理 (2)
  - 软件缺陷描述与分类
  - 软件缺陷的处理与跟踪
  - 软件缺陷报告
  - 软件缺陷的度量与分析
  - 软件缺陷管理工具

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■ D. COURSE TOPICS

■ 软件可靠性测试 (1)

　■ 软件可靠性分析与设计

　■ 软件可靠性评估

　■ 软件可靠性测试

■ *软件国际化与本地化测试

■ *面向对象软件的测试

■ *典型应用软件测试综述

　■ 客户端应用软件测试

　■ 移动应用软件测试

　■ 云应用软件测试

　■ 游戏软件测试

　■ 嵌入式软件测试

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■ E. TEXT AND REQUIRED SUPPLIES

- Course Notes
  - Check stmt_sysu@163.com
- References
  - *Ron Patton*, Software Testing, 2nd Ed., Pearson (2005)
  - *Paul C. Jorgensen*, Software Testing - A Craftsman's Approach, 4thEd., CRC (2010)
  - *Glenford J. Myers*, The Art of Software Testing, 2nd Ed., Wiley (2004)
  - *Paul Ammann*, Introduction To Software Testing, Cambridge U. Press (2008)
  - *Frederick Brooks* (1999 *Turing* Award winner), The Mythical Man-Month: Essays on Software Engineering, 1975~2015.
    - With *No Silver Bullet : Essence and Accident in Software Engineering*, 1986.
  - 朱少民, 软件测试方法和技术, 清华大学出版社 (2014)
  - 郑人杰, 软件测试, 清华大学出版社 (2011)

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F. GRADING PLAN

- Final Exam 60%

- Class Attendance & Performance 10%

- Assignments 30%

  - **Important**: You can discuss the problems with your classmates, but all work handed in should be original, written by you in your own words and submit to TA on time. No late homework will be accepted.

  - Check stmt_sysu@163.com to get your S/N from Name-List documents and UPDATE with your TA's mailbox for handing in your assignments.

G. CLASSROOM RULES OF CONDUCT

- Cell phone using

- Laptop using

- Food & drink

- Being Late for class