高级软件工程 Advanced Software Engineering

● 教师介绍 Faculty

李征 Zheng Li

Work Experience:
• Current Beijing University of Chemical Technology, China
  Jan 2011 Full Professor
• Dec 2010 University College London, UK
• Aug 2010 Research Associate
        Transfer from King's College London with the whole CREST centre
• Jul 2010 CREST centre, King's College London, UK
• May 2005 Research Associate
• April 2005 CREST centre, King's College London, UK
• Sept 2004 Visiting Research Associate
        Transferred from Brunel University
• Aug 2004 Brunel University, UK
• April 2004 Visiting Research Associate
        Working on search based regression testiong
• March 2004 Beijing University of Chemical Technology, China
• Sept 1996 Lecture

Education:
• March 2009 Ph.D in Computer Science, King's College London, UK
• July 1996 Bachelor of Engineering, Beijing University of Chemical Technology, China

Research:
• Search-based Software Engineering and Testing
• State-based Model Slicing and Testing

Recent Publications:
[1] Yong Liu, Zheng Li, Ruilian Zhao, Pei Gong. An optimal mutation execution strategy for cost reduction
of mutation-based fault localization. In Information Sciences, Volume 422, 2018, Pages 572-596
[2] Shuyao Sun, Junxia Guo, Ruilian Zhao and Zheng Li. Search-Based Efficient Automated Program Repair

Using Mutation and Fault Localization. 2018 IEEE 42nd Annual Computer Software and Applications

Conference (COMPSAC), Tokyo, 2018, pp. 174-183.

[3] Yi Bian, Zheng Li, Junxia Guo, Ruilian Zhao. Concrete hyperheuristic framework for test case prioriti-

zation. Journal of Software: Evolution and Process, 30 (11), e1992. 2018.

[4] Kelly Androutsopoulos, David Clark, Mark Harman, Robert Hierons, Zheng Li, Laurence Tratt. Amor-

phous Slicing of Extended Finite State Machines. IEEE Transactions on Software Engineering, 39(7):892–

2909, 2013.

[5] David Binkley, Nicolas Gold, Mark Harman, Syed Islam, Jens Krinke and Zheng Li. Efficient Identification

of Linchpin Vertices in Dependence Clusters. ACM Transactions on Programming Languages and Systems

(TOPLAS), 35(2), Article 7, PP1–35, July 2013.

[6] Kelly Androutsopoulos, Dave Binkley, David Clark, Nicolas Gold, Mark Harman, Kevin Lano, and Zheng

Li. Model projection:Simplifying Models in Response to Restricting the Environment. In The 33rd Int.

Conference on Software Engineering (ICSE '11), pages 291-300, Honoulu, Hawaii, USA, May 2011.

[7] Kelly Androutsopoulos, David Clark, Mark Harman, Zheng Li, and Laurie Tratt. Control dependence for

extended finite state machines (best theory paper award winner). In Fundamental Approaches to Software

Engineering (FASE '09), volume 5503, pages 216–230, York, UK, March 2009. Springer LNCS.

[8] Zheng Li, Mark Harman, and Rob Hierons. Meta-heuristic search algorithms for regression test case

prioritization. IEEE Transactions on Software Engineering, 33(4):225–237, 2007.

- **课程介绍 About Course**

Instructor: Li, Zheng

Assistant: None

Number: Comp503e

Hours: 32

Credits: 2

Prerequisites: Software Engineering, Operating system in the BSc course

Description:

This module covers a range of Software Engineering (SE) material. The emphasis is on the knowledge needed to be able to model, design, implement and evaluate larger software systems effectively. The content starts with development lifecycle models, such as agile development, and then continues to cover requirements specification, requirements analysis, object-oriented concepts, and object-oriented design. Software engineering is an inherently practical subject and

applying the concepts being taught is a vital component of developing expertise in this area.

Textbooks:
Software Engineering: A Practitioner's Approach, 8/e, Roger S.Pressman and Bruce R. Maxim
References:

● 课程大纲 Syllabus

Chapter 1: Introduction to Advanced Software Engineering
What is Advanced Software Engineering (ASE)? The notion of science, technology and engineering, and the evolving role of software, the changing nature of software.

Chapter 2: The Software Process
The process framework, process patterns, evolutionary process models, the unified process and Agile process model.

Chapter 3: Quality Management- Software Testing 1
The introduction of software testing and testing strategies for different type of software

Chapter 4: Quality Management- Software Testing 2
The testing techniques for conventional applications, including control and data flow analysis in white-box testing and approaches in black-box testing.

Chapter 5: Search Based Software Engineering (SBSE)
Search techniques and what is SBSE? What is the difference between SBSE and traditional SE? The application of SBSE in requirement analysis, software testing (structure testing and regression testing) and project management.

Chapter 6: Software Reuse and Component Based Software Engineering (CBSE)
What is software reuse? Software reuse architecture, approaches and framework; What is a component? What is CBSE?

Chapter 7: Service Oriented Software Engineering (SOSE)
What is Service and Service Oriented Architecture (SOA)? Web service and web service oriented development

Grade Points: Individual Coursework 30% + Examination 70%

● 教案　　　Teaching Plan
● 视频　　　Video