Systems V &V, Quality and Standards (CSE4431) Semester 2 2005

Available online on the unit web page: Week 5, Aug 15, 2005

Revised Deadlines (Extension): Assignment Now due in Week 12

Electronic Submissions (Paper & presentation) by midnight, Tuesday, week 12 and Hard copies of the same in class before 10am, Wednesday, week12

(Deadlines given at the start of semester: Paper submission in PDF: Due Date: Week 11, Oct 5, 2005 Presentation submission in ppt format: Due date: Weeks 12)

Presentation from a list of selected papers submitted: Weeks 12 & 13

Topic Areas (not in any order of importance):

1. **Regression Testing of Component based Software systems**
2. **Controlled Experimentation with Software Testing and Regression Testing**
3. **Test Prioritization**
4. **Residual Test Coverage**
5. **Efficient Instrumentation**
6. **Mock Objects Test Factoring**
7. **Aspect testing**

Some relevant references:

Topic 1: Regression Testing of Component based Software systems

On Test Suite Composition and Cost-Effective Regression Testing, G Rothermel , S Elbaum,A G. Malishevsky,P Kallakur,X Qiu, ACM Transactions on Software Engineering and Methodology, Vol. 13, No. 3, July 2004, Pages 277–331. Abstract. PDF.

Software Architecture-based Conformance and Regression Testing, H Muccini, M Dias and D Richardson, Dipartimenti di Informatica, Università di L'Aquila, TR 002/2004, 2004

Using Component Metadata to Support the Regression Testing of Component-Based Software, M. J. Harrold, A. Orso, D. Rosenblum, G. Rothermel, M. L. Soffa, and H. Do, *IEEE International Conference on Software Maintenance,* November, 2001, Florence, Italy. Abstract. Postscript. PDF.

Architecture-Based Regression Testing of Evolving Systems, Mary Jean Harrold , International Workshop on the Role of Software Architecture in Testing and Analysis, Marsala, Sicily, Italy, June 1998

M. J. Harrold, J. Jones, T. Li, D. Liang, A. Orso, M. Pennings, S. Sinha, S. Spoon, and A. Gujarathi, "Regression Test Selection for Java Software", Proceedings of the ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2001)
http://citeseer.ist.psu.edu/harrold01regression.html

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@inproceedings{ harrold01,
author = {Harrold, M.J. and Jones, J. and Li, T. and Liang, D. and Orso, A. and Pennings,
M. and Sinha, S. and Spoon, S. and Gujarathi, A.},
  title =           {Regression Test Selection for Java Software},
  booktitle = {Proceedings of the ACM Conference on Object-Oriented Programming, Systems,
Languages, and Applications (OOPSLA 2001)},
  year =   {2001},
```

```
  month =        {November},
  url = {citeseer.ist.psu.edu/harrold01regression.html} }
```

Topic 2: Controlled Experimentation with Software Testing and Regression Testing

On Test Suite Composition and Cost-Effective Regression Testing; G. Rothermel, S. Elbaum, A. G. Malishevsky, P. Kallakuri, and X. Qiu, *ACM Transactions on Software Engineering and Methodology*, V. 13, no. 3, July, 2004, pages 277-331. Abstract. PDF.

Infrastructure Support for Controlled Experimentation with Software Testing and Regression Testing Techniques; H. Do, S. Elbaum, and G. Rothermel, *Proceedings of the International Symposium on Empirical Software Engineering*, August, 2004, pages 60-70. Abstract. PDF

Analyzing Regression Test Selection Techniques, G Rothermel and M J Harrold, *IEEE Transactions on Software Engineering*, V.22, no. 8, August 1996, pages 529-551. Abstract. Postscript. PDF.

Should Computer scientists experiment more? W F Tichy (1998), IEEE Computer, 31(5), May 1998, pp. 32-40. http://wwwipd.ira.uka.de/~tichy/publications/moreexperiments/moreexperiments.html

Topic 3: Test Prioritization

Selecting a Cost-Effective Test Case Prioritization Technique, S. Elbaum, G. Rothermel, S. Kanduri, and A. G. Malishevsky, *Software Quality Journal*, V. 12, no. 3, September, 2004, pages 185 - 210. Abstract. PDF.

Test Case Prioritization. Gregg Rothermel, Roland Untch, Chengyun Chu, and Mary Jean Harrold, IEEE Transactions on Software Engineering, vol.27, no.10, pp.929-948, October, 2001
http://cse.unl.edu/~dohy/pdf_files/issre-04.pdf

On Test Suite Composition and Cost-Effective Regression Testing, G Rothermel , S Elbaum,A G. Malishevsky,P Kallakur,X Qiu, ACM Transactions on Software Engineering and Methodology, Vol. 13, No. 3, July 2004, Pages 277–331. Abstract. PDF.

.Topic 4: Residual Test Coverage Monitoring

C. Pavlopoulou and M. Young. Residual test coverage monitoring. In Proceedings of the 21st international conference on Software engineering, pages 277--284. IEEE Computer Society Press, 1999.
http://citeseer.ist.psu.edu/pavlopoulou99residual.html and
MS thesis of C Pavlopooulou for more details.

@inproceedings{ pavlopoulou99residual,

```
    author = "Christina Pavlopoulou and Michal Young",
    title = "Residual Test Coverage Monitoring",
    booktitle = "International Conference on Software Engineering",
    pages = "277-284",
    year = "1999",
    url = "citeseer.ist.psu.edu/pavlopoulou99residual.html" }
```

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Residual Coverage monitoring of Java programs (refer to URL, M Young,
University of Oregon, USA)
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Beta-Carotene - (refer to URL, M Young, University of Oregon, USA)
http://www.cs.uoregon.edu/research/perpetual/dasada/edcs/Residual-java.html

Topic 5: Efficient Instrumentation

M. Tikir and J. Hollingsworth. Efficient instrumentation for code coverage testing. In Int'l. Symp. Softw. Testing Anal., July 2002. http://citeseer.ist.psu.edu/tikir02efficient.html

@misc{ tikir02efficient,
author = "M. Tikir and J. Hollingsworth",
title = "Efficient instrumentation for code coverage testing",
text = "M. Tikir and J. Hollingsworth. Efficient instrumentation for code coverage testing. In Int'l. Symp. Softw. Testing Anal., July 2002.",
year = "2002",
url = "citeseer.ist.psu.edu/tikir02efficient.html" }

Pacemaker project, University Oregon – Gretel – open source residual test coverage tool

Open Source code coverage tools in Java
http://java-source.net/open-source/code-coverage

Hansel 1.0 http://hansel.sourceforge.net/

Hansel Tutorial http://hansel.sourceforge.net/ doc/tutorial.html

Bytecode Engineering Library (BCEL 5.0) http://jakarta.apache.org/bcel/indx.html

Topic 6: Mock Objects Test Factoring

About Mock Objects http://www.onjava.com/pub/a/onjava/2004/02/11/mocks.html

http://www.xprogramming.com/xpmag/virtualMockObjects.htm

Virtual Mock Objects using AspectJ with JUNIT, Simon Monk, Stephen Hall, 2002

The authors show us how they use aspect-oriented programming in AspectJ to facilitate isolation of testable units, without hand-crafting Mock Objects or using a specialized Mock Object generation tool. The full code for this framework is available from http://homepage.mac.com/simon.monk/aspectj/index.html

Automating test factoring for Java, D Saff, S Artzi, J H Perkins and M D Ernst, ASE 05, Proceedings of the 21st Annual International conference on Automated Software Engineering, CA, USA, Nov 2005

Automatic mock object creation for test factoring, D Saff and M D Ernst, In ACM SIGPLAN/SIGSOFT Workshop on Program Analysis for Software Tools and Engineering (PASTE'04), Washington, DC, USA, June 2004, pp. 49-51

Topic 7: Aspect Testing

Can Aspects Implement Contracts?, Stephanie Balzer, Patrick Th. Eugster, Bertrand Meyer, In RISE 2005 ((Rapid Implementation of Software Engineering techniques), Heraklion, Greece, Sep 2005, to appear as

Springer Lecture Notes in Computer Science.
http://se.ethz.ch/~meyer//publications/lncs/aspects_contracts.pdf

Detecting Redundant Unit Tests for AspectJ Programs,Tao Xie, Jianjun Zhao, Darko Marinov and David Notkin, Technical Report UW-CSE-04-10-03, October 2004; Revised December 2004
http://www.fit.ac.jp/~zhao/pub/ps/UW-CSE-04-10-03.pdf

Towards the Systematic Testing of Aspect-Oriented Programs, Roger T. Alexander, James M. Bieman and Anneliese A. Andrews
http://www.cs.colostate.edu/~rta/publications/CS-04-105.pdf

A State-Based Approach to Testing Aspect-Oriented Programs, Dianxiang Xu, Weifeng Xu, and Kendall Nygard http://cs.ndsu.edu/~dxu/publications/SEKE05-xu.pdf

Data Flow Integration Testing Criteria for Aspect-Oriented Programs,
http://twiki.im.ufba.br/pub/WAsp/AcceptedPapers/WASP-Lemos.pdf

Student Paper

Students in CSE4431 in sem 2 2005 will be given a topic from the above list of 7 areas. This is in response to assessment workload issues raised by the students.

(In the past (2002-2004), students in CSE4431 class were asked to refer to http://www.csse.monash.edu.au/~sitar/CSE4431-MUSE2002/V-V-Qual-Stds.pdf (updated each semester of offering) for topic areas for their Assignment 3. Students were asked to choose a topic and ask the lecturer to okay it, as students were expected to choose from a variety of topic areas from the pdf file given or specify a topic of special interest to the student in the area of software testing).

The paper must include an abstract, overview of the paper, motivation, literature review, students' contribution, related work, weakness of the techniques discussed, further work and a summary/conclusion.

Content and Style

1. Must include an abstract, overview of the paper, motivation, literature review, students' contribution, related work, weakness of the techniques discussed,
further work and a summary/conclusion

2. Use academic style writing and do not use sales or marketing or flowery language

3. Check for typos, grammar, style

4. Use page numbers in the paper submitted

5. References must include refereed articles from Proceedings and Journals and not just from popular magazines or websites. In sem 2 2005, students may use just the references & URLS given with the topic areas above. Books are fine but cannot be the sole references. Citing must

be done properly. (A minimum of six references was required in 2002-2004). Refer to standards for citation in past Honours theses and/or in the refereed articles you have refereed to.

Submission

Papers must not exceed 10 pages in the conference format. Papers exceeding the length restriction will not be reviewed. (see http://computer.org/cspress/instruct.htm for the guidelines and ftp://pubftp.computer.org/Press/Outgoing/proceedings/ for the formatting files). Convert ps to pdf from Linux using ps2pdf filename command and submit the paper as a pdf file electronically.

Students are required to submit an electronic version via email by Week 12 as well as hand in a hard copy of both the 10 page paper plus 15-20 power point slides for the presentations to be held in Week 12 & Week 13. Papers will be selected at random for presentation on the 2 days. Students are expected to be present and participate during the 2 hour class presentations.

Judging for Best paper (and possible submission to a conference)

Your paper will be judged for its content, written style & format.

Hints on How to Read a Research Paper

Refer to http://www.cs.ucsd.edu/users/wgg/CSE210/howtoread.html on: How to read an Engineering Research Paper from Prof. Bill Griswold, Dept Comp.Sc & Engineering, University California, San Diego, Standard one page form that he gets the students to use - http://www.cs.ucsd.edu/users/wgg/CSE210/paperform.pdf

Presentation

1. Refer to Guidelines given for Presentation by http://www.iasted.org/conferences/2002/hawaii/tips-359.htm

2. Stick to Time limit given (20 minutes + 5 minutes for Questions)

3. Practice talk in front of a mirror at home or with a friend and do not come unprepared/unrehearsed to your presentation

4. **Attendance to all your peers' presentation is compulsory. 10 Marks will be deducted for non attendance.**

5. **Participation by asking relevant questions at the end of your peer's presentation carries marks for you asking the question and to the presenter if he/she answers them clearly. Collusion between presenter and the peer member re: Q/A carries a heavy penalty.**

6. Follow a strict decorum. No whistling or heckling or inappropriate behaviour will NOT be tolerated.

7. Presentations are to be treated as strictly academic/professional activities.