CS 4501/6501: Extra credit
Due date: 28-November

Purpose: Explore current research and practice in software testing and examine software testing tools

For this extra credit activity, you may work individually or in a group of two.

There are several ways to complete this activity and earn credits. You may choose to investigate research, practice, tools, or frameworks in software testing. You may examine and/or compare testing tools or frameworks. You will then present what you've read/investigated and learned (or your findings), and your opinions to class. You may use slides or media of your choice to present the materials. The presentation should be 10-15 minutes (including Q&A).

Please enter your name to sign up

If you are interested in research, practice, tools, or frameworks that are not listed here, or would like to conduct a project or research related to software testing, please discuss with me for alternatives.

Here is a list of possible topics:

Topic	Paper/Reading
Testing automation	*Software Test Automation Practices in Agile Development Environment: An Industry Experience Report*, Eliane Figueiredo Collins and Vicente Ferreira de Lucena, Jr., 7th International Workshop on Automation of Software Test, Pages 57-63, Zurich, Switzerland, June 2012
	Test Automation in the Real World—2016, (*results from a survey monkey poll*)
	New survey reveals test automation trends, Cecilia Rehn, Software Testing News August 2015 (*summary of a longer article behind a pay wall*)
	Test Oracle Strategies for Model-based Testing, Nan Li and Jeff Offutt, IEEE Transactions on Software Engineering, 2017
Testing the Internet of Things	*Functional Testing for IoT*, Chris Riley, DeveOps.com blog post, February 2015
	Security Testing the Internet of Things IoT, *author and date not given*, Beyond Scurity. (*Note this is essentially an advertisement for a company's product, nevertheless, it contains useful ideas*)
	Testing the Internet of Things: The Human Experience, Gerie Owen, November 2014, InfoQ (*online*)
	Breaking Down Mirai: An IoT DDoS Botnet Analysis, Ben Herzberg, Dima Bekerman, and Igal Zeifman, Imperva Incapsula blog (*online*)
Testing web applications	*A Case Study on Bypass Testing of Web Applications*, Jeff Offutt, Vasileios Papadimitriou, and Upsorn Praphamontripong, Springer's Empirical Software Engineering journal, 19(1):69-104, February 2014
	Modeling Presentation Layers of Web Applications for Testing, Jeff Offutt and Ye Wu, Springer's Software and Systems Modeling, 9(2):257-280, April 2010

	Prioritizing User-session-based Test Cases for Web Applications Testing, Sreedevi Sampath, Renée Bryce, Gokulanand Viswanath, Vani Kandimalla, and Güneş Koru, First International Conference on Software Testing, Verification, and Validation, April 2008
	An Experimental Evaluation of Web Mutation Operators, Upsorn Praphamontripong, Jeff Offutt, Lin Deng, and JingJing Gu, Eleventh Workshop on Mutation Analysis, Chicago, Illinois, April 2016
Testing mobile applications	*Dynodroid: an input generation system for Android apps*, Aravind Machiry, Rohan Tahiliani, and Mayur Naik, 9th ACM Joint Meeting on Foundations of Software Engineering (ESEC/FSE), Saint Petersburg Russia, 2013, pages 224-234
	Automated Test Input Generation for Android: Are We There Yet?, Shauvik Roy Choudhary, Alessandra Gorla, and Alessandro Orso, 30th IEEE/ACM International Conference on Automated Software Engineering (ASE), Bergamo, Italy, 2015, pages 429-440
	Sapienz: multi-objective automated testing for Android applications, Ke Mao, Mark Harman, and Yue Jia, 25th International Symposium on Software Testing and Analysis (ISSTA), Saarbrücken Germany, 2016, pages 94-105
	Mutation Operators for Testing Android Apps, Lin Deng, Jeff Offutt, Paul Ammann, and Nariman Mirzaei, Elsevier's Information and Software Technology, 81:154-168, January 2017
Testing for security	*Software Security Testing*, Bruce Potter and Gary McGraw, IEEE Security & Privacy, 2(5):81-85, September-October 2004
	Finding Security Vulnerabilities in Java Applications with Static Analysis, V. Benjamin Livshits and Monica S. Lam, 14th conference on USENIX Security Symposium—Volume 14, Berkeley CA, USA, 18-18, 2005
	Method Using Command Abstraction Library for Iterative Testing Security of Web Applications, Seiji Munetoh and Nobukazu Yoshioka, International Journal of Secure Software Engineering (IJSSE), 2015, Vol.6(3), pp.26-49
	Why Software DoS is Hard to Fix: Denying Access in Embedded Android Platforms, Ryan Johnson, Mohamed Elsabagh, and Angelos Stavrou, International Conference on Applied Cryptography and Network Security (ACNS), Guildford, UK, June 2016, pp 193-211
Testing object-oriented software	*Testing Object Oriented Software: A Survey*, Robert V. Binder, Wiley's Software Testing, Verification and Reliability, 6(3-4):125-252, December 1996
	Testing Object-oriented Software Systems, Harry M. Sneed, 24th European Conference on Object-Oriented Programming (ECOOP), Maribor, Slovenia, June 2010
	Testing Coupling Relationships in Object-Oriented Programs, Roger T. Alexander, Jeff Offutt, and Andreas Stefik Wiley's Journal of Software Testing, Verification, and Reliability, 20(4):291-327, December 2010
	Dynamic data flow testing of object oriented systems, Giovanni Denaro , Alessandro Margara , Mauro Pezzè , Mattia Vivanti, Proceedings of the 37th International Conference on Software Engineering, May 16-24, 2015, Florence, Italy
Usability testing	*Design and Implementation of a toolkit for Usability Testing of Mobile Apps*, Xiaoxiao Ma, Bo Yan, Guanling Chen, Chunhui Zhang, Ke Huang, Jill Drury, and Linzhang Wang. Mobile Networks and Applications, 18(1):81-97, February 2013

	Web Evaluation: Heuristic Evaluation vs. User Testing, Wei-Siong Tan, Dahai Liu, and Ram Bishu, International Journal of Industrial Ergonomics, 2009, 39(4), pp.621-627
Load testing	*A Survey on Load Testing of Large-Scale Software Systems*, Zhen Ming Jiang and Ahmed E. Hassan, IEEE Transactions on Software Engineering, 41(11):091-1118, November 2015
	Load Testing of Web Sites, Daniel A. Menasce, IEEE Internet Computing, 6(4):70-74, July-August 2002
	Automatic Identification of Load Testing Problems, Zhen Ming Jiang, Ahmed E. Hassan, Gilbert Hamann, and Parminder Flora, 2008 IEEE International Conference on Software Maintenance, Beijing, 2008, pp. 307-316
Non-functional testing	*Targeted Mutation: Efficient Mutation Analysis for Testing Non-Functional Properties*, Björn Lisper, Birgitta Lindström, Pasqualina Potena, Mehrdad Saadatmand, and Markus Bohlin, IEEE International Conference on Software Testing, Verification and Validation Workshops (ICSTW), Tokyo, 2017, pp. 65-68
	A Fault Model and Mutation Testing of Access Control Policies, Evan Martin and Tao Xie, Sixteenth International Conference on World Wide Web, Alberta, Canada, May 2007, p. 667-676
Tools and frameworks	*Protractor*, Protractor is an end-to-end testing framework for Angular and AngularJS applications. It allows testers to simulate interaction with the UI, just like a human user would do.
	Telerik, Telerik Test Studio is a testing framework that provides integration with numerous source control systems for running tests with continuous integration.
	Jasmine, Jasmine is a testing framework for JavaScript. It support asynchronous testing and testing and makes use of spies for implementing test doubles.
	Selenium, Selenium is a testing framework for web applications. It is a browser automation tool that allows testers to simulate human users' interaction with the UIs.

Grading Rubric

[Total: 10 extra points (toward assignments)]

- (1 point) — Submission of slides or media of your presentation
  - Submit your file to **Collab**. If you have multiple file, zip all of your files into a single .zip file. Submit your .zip file to **Collab**. If you work in group, be sure to include all names in the slides (or media) and make a note in Collab. Each team submits only **one** copy.
  - Making your submission to me and the TAs is **your** responsibility; if we cannot access your file then you will not get credit. Be sure to test access to your file before the due date.
- (9 points) — Quality of the presentation (please refer to the detailed rubric below)
  - If you work in group, each member is expected to present his/her contribution. Both members will receive the same points, unless it is necessary to separate the grading.

Category	score = 3	score = 2	score = 1
Content	Shows a **full** (or good) understanding	Shows a good understanding of **parts** of the topic.	Does **not** seem to understand the topic very well. Does not

	of the topic. Clearly and adequately relates the topic with concepts learned from class.	Adequately relates the topic with concepts learned from class.	adequately relate the topic with concepts learned from class.
Preparedness	Student is **completely** prepared and has obviously rehearsed.	Student seems **somewhat** prepared but might have needed more rehearsals.	Student does **not** seem at all prepared to present.
Presentation media	Slides or media adequately present information in logical sequence. Graphics clearly illustrate the discussion. Presentation has no misspellings.	Slides or media present information in logical sequence but more or less information would have been helpful. Graphics relate to the discussion. Presentation has no more than two misspellings.	There is no sequence of information and/or so much is missing that the presentation makes little sense. Presentation includes no graphics or graphics are barely or unrelated to the discussion. Presentation has three or more misspellings.