

Pushing the boundaries of User Experience Test Automation

@StarWest 2011

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What we want to achieve



*To automatically detect (some)
issues that may adversely
affect the User Experience*

So what are the business problems?



- Quality-In-Use:
 - UX, Cross-browser & Accessibility issues on live site
- Engineering Productivity:
 - Time taken from feature-complete to live site
- Quality Engineering:
 - Over-reliance on manual testing
 - Existing test-automation under-performing

And some UX Test Automation problems...

- Minimal existing work in Industry
 - Existing tools tend to test static aspects
- Academic work appears to be unsuitable
- How to automatically measure and test UX *at all!*

UX = User Experience



- Dynamic, based on *using* the system

Accessibility

Findability

Credibility **Holistic** Usability

Desirability

Usefulness

Includes Perceptions

- We focus on the Human + Computer Interactions

Using Heuristics*

1. When I navigate by tabbing I should return to where I started in a reasonable number of key-presses
2. Flow should be consistent through web-forms
3. Look-alike & work-alike across web browsers
4. I should not be able to bypass the security of the site from links in the UI

* *Fallible, but useful, guide/approach/practice*

Equivalence of input paths

Mouse

- Clicks...

New

Dropdown

Select

Send

4 inputs

Keyboard

- Keystrokes

Tab

Space

Down-arrow

Enter

Tab

Enter

10 inputs

Automated exploration and discovery*



- Automating heuristic tests
 - Web accessibility testing
 - Fighting layout bugs
 - BiDi checker
- Using Crawling tools
 - Crawljax

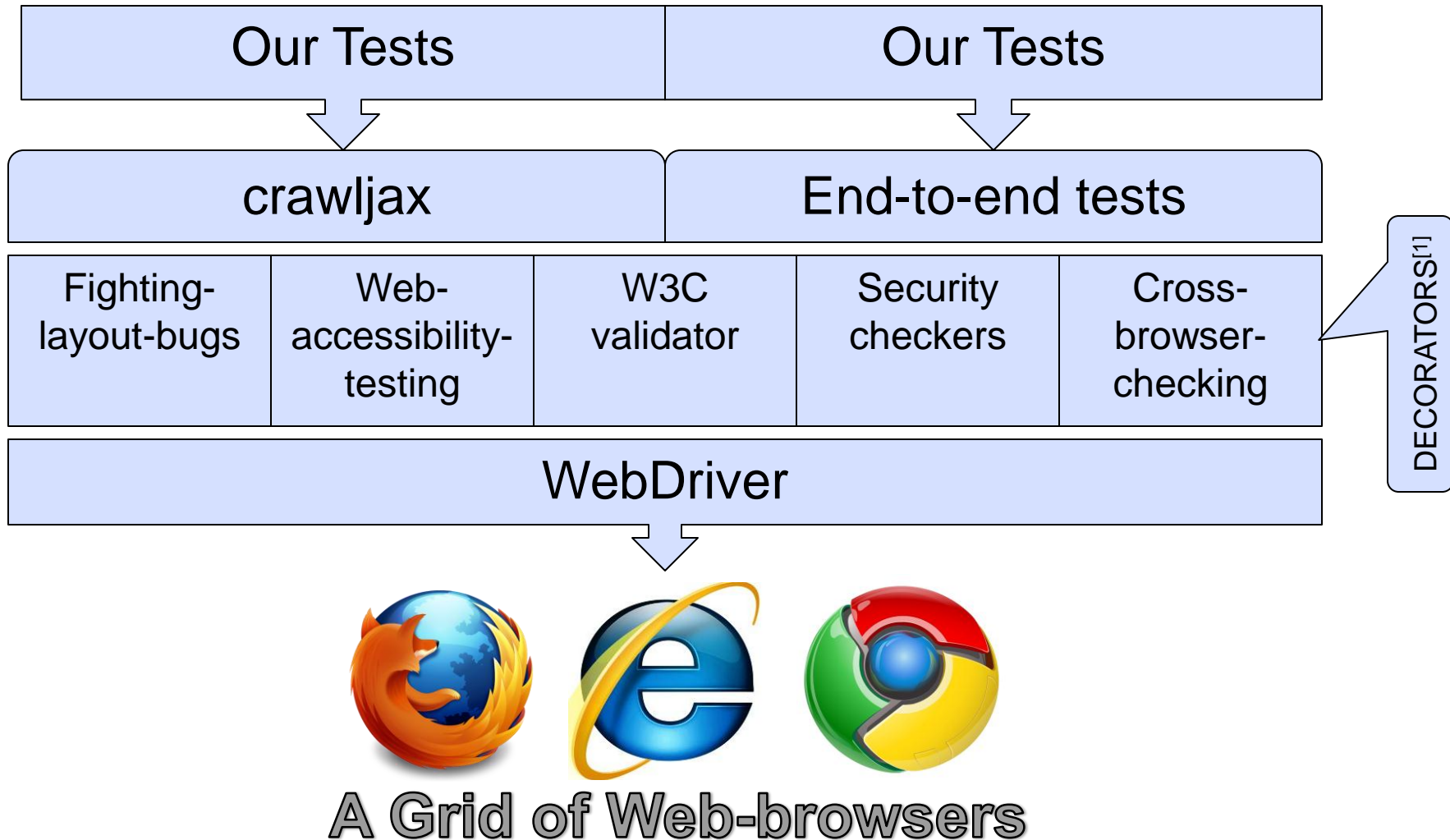
** We're working on complementary work on interactive exploration and discovery*

Man & Machine



- Fully automated execution, human inspection
- Interactive testing, aided by tools

The moving parts...



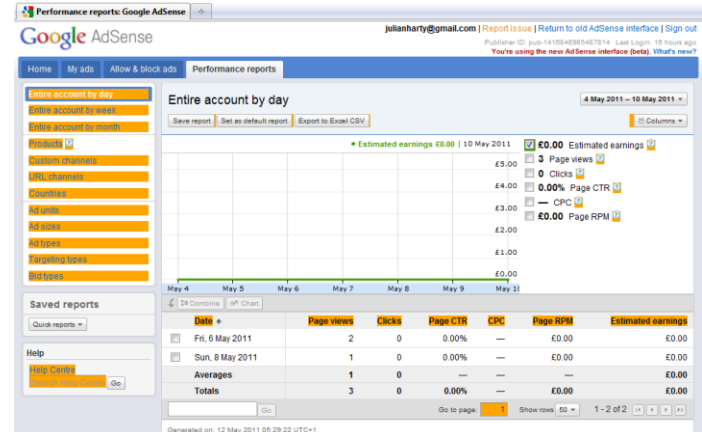


DEMO

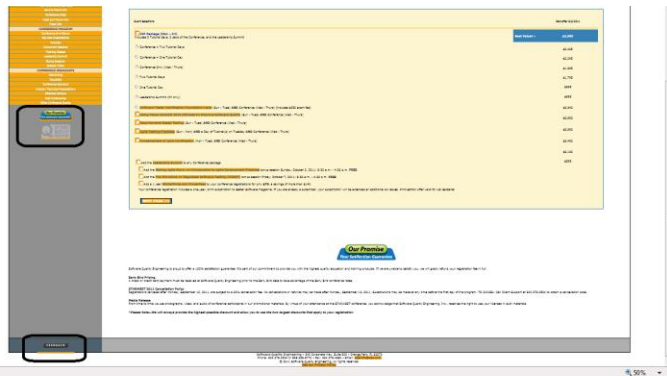
Sample screenshots



<http://www.google.co.in>



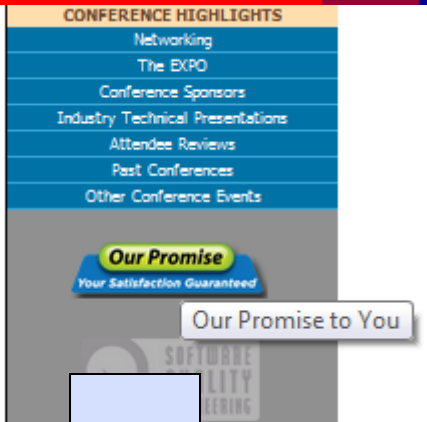
<http://adsense.google.com>



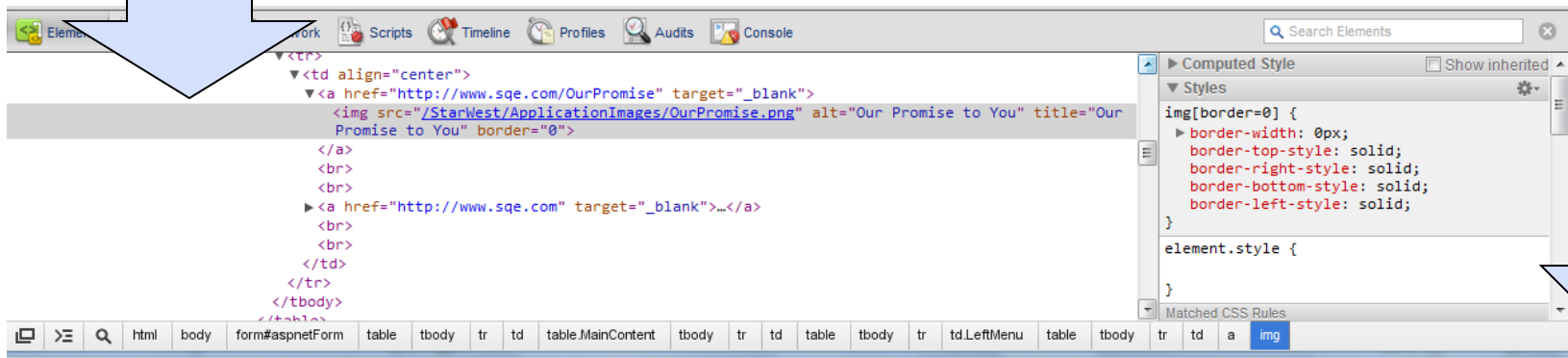
<ul style="list-style-type: none"> Software Tester Certification-Foundation Level (Sun - Tues) AND Conference (Wed - Thurs) [includes \$250 exam fee] Using Visual Studio® 2010 Ultimate To Improve Software Quality (Sun - Tues) AND Conference (Wed - Thurs) Requirements Based Testing (Sun - Tues) AND Conference (Wed - Thurs) 	<p>\$3,940</p> <p>\$3,690</p> <p>\$3,690</p>
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<http://www.sqe.com/starwest/...>

Problems detected:



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And what about Static Analysis?

- Don't overlook the value of static analysis (but don't rely on it either...)
- Find ways to filter the reported results
- We've created automated Accessibility Tests, which check the contents of pages using WCAG guidelines.

Beware of (over-)trusting test automation

- Automation as servant, not master, of our software delivery
 - Inaccurate results
 - “Beware of Automation Bias” by M.L. Cumming^[1]
- Automated tests and checks miss more than they find
- Make behavior easier to assess
 - Screenshots and contents of DOM to verify after tests ran
 - Automated video recordings

[1] <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.91.2634&rep=rep1&type=pdf>

What we think we're testing...



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Suggestions for you



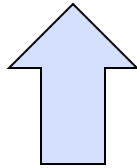
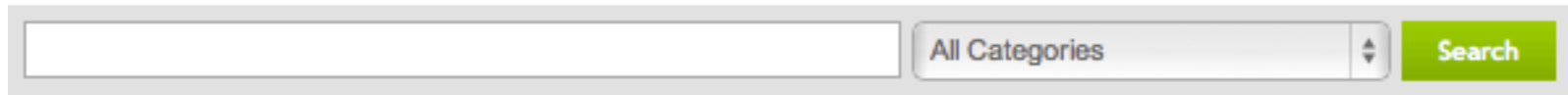
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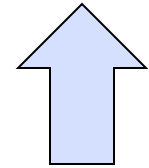
GRAB A BARGAIN
Find items ending soon

[Check it out >](#)

What our automated test actually interacts with...

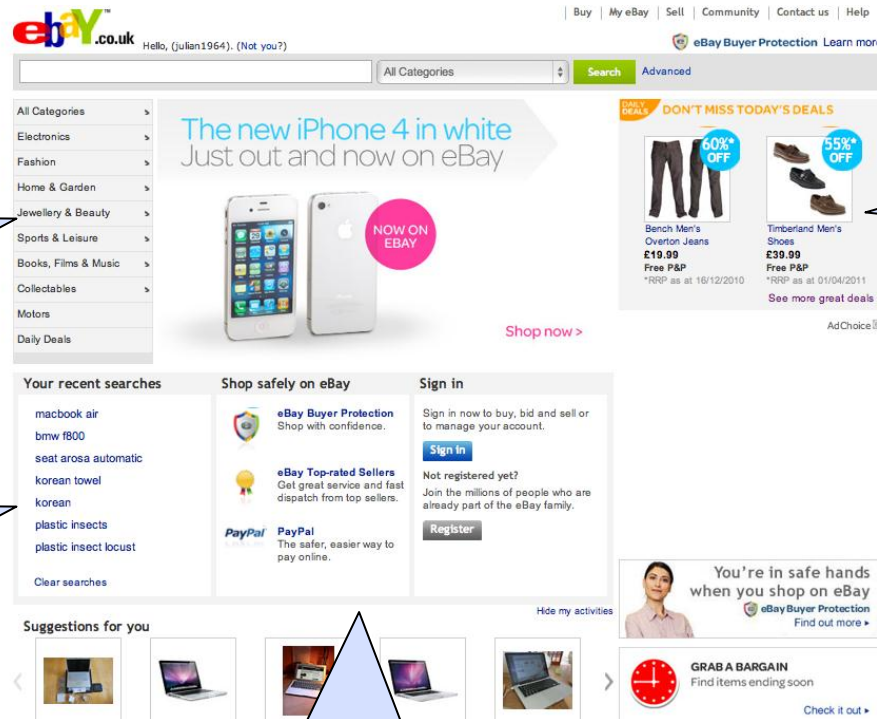


Enter text here



'click'

(Some of the) things our automated tests miss...



Navigation

History

Promotions

Problem
JavaScript
CSS and
HTML

Layout,
Rendering &
Formatting

Beware of poor-quality automated 'tests'

- `AssertTrue(true) ;`
- No/Inadequate/Too many Asserts
- Poor code design
- Falsehoods (False positives / negatives)
- Focus on:
 - Improving the quality of your automated tests
 - Finding ways to improve the quality, & testability, of the code being tested

Increasing the signal-to-noise of test results



- Suppress unwanted ‘warnings’
 - C.f. static analysis tools
- Increase potency of tests
- Consider dumping ineffective tests

Further reading and research



The opensource project

<http://code.google.com/p/web-accessibility-testing>

Finding Usability Bugs with Automated Tests

<http://queue.acm.org/detail.cfm?id=1925091>

Fighting Layout Bugs

<http://code.google.com/p/fighting-layout-bugs/>

Experiences Using Static Analysis to Find Bugs

<http://www.google.com/research/pubs/pub34339.html>

My blog

<http://blog.bettersoftwaretesting.com/>

“Beware of Automation Bias” by M.L. Cummings

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.91.2634&rep=rep1&type=pdf>

Designing and Engineering Time by Steven Stow

ISBN 978-0-321-50918-5

Questions now?

Questions later...

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