

WebSee: A Tool for Debugging HTML Presentation Failures

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Web Applications



*It takes users only **50 ms** to form opinion about your website (Google research - 2012)*

Online shopping service



Motivation

- Presentation of a website
 - Crucial to make first impression

End user – no penalty to move to another website
Business – loses out on valuable customers

- Impact of presentation failures
 - Gives negative impression of your business
 - Affects branding efforts
 - Reduces usability and trustworthiness

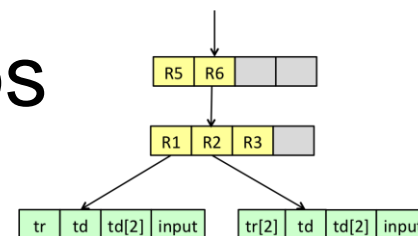
WebSee

- Underlying technique [ICST '15]
- Goal – Automatically detect and localize presentation failures

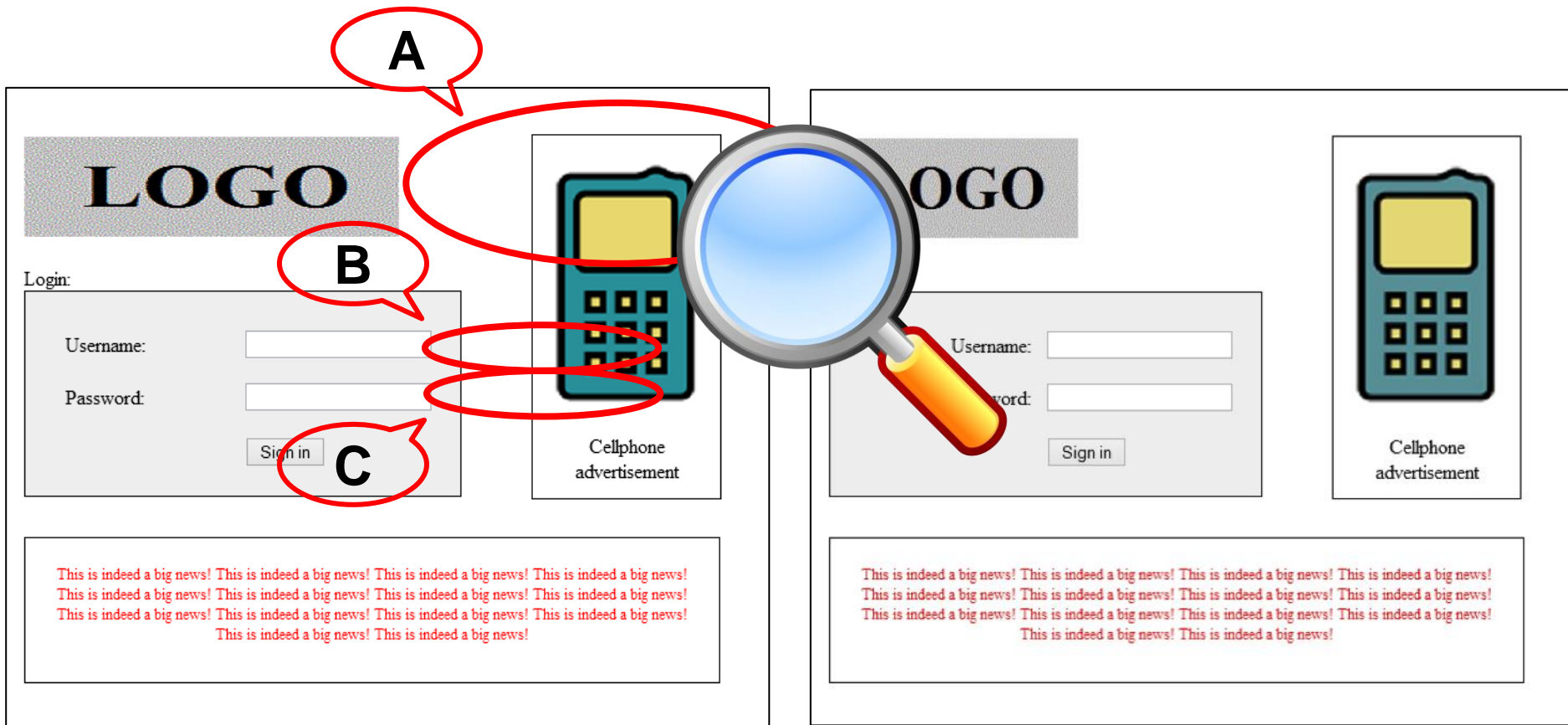
- **Detection** – Computer vision



- **Localization** – Rendering maps

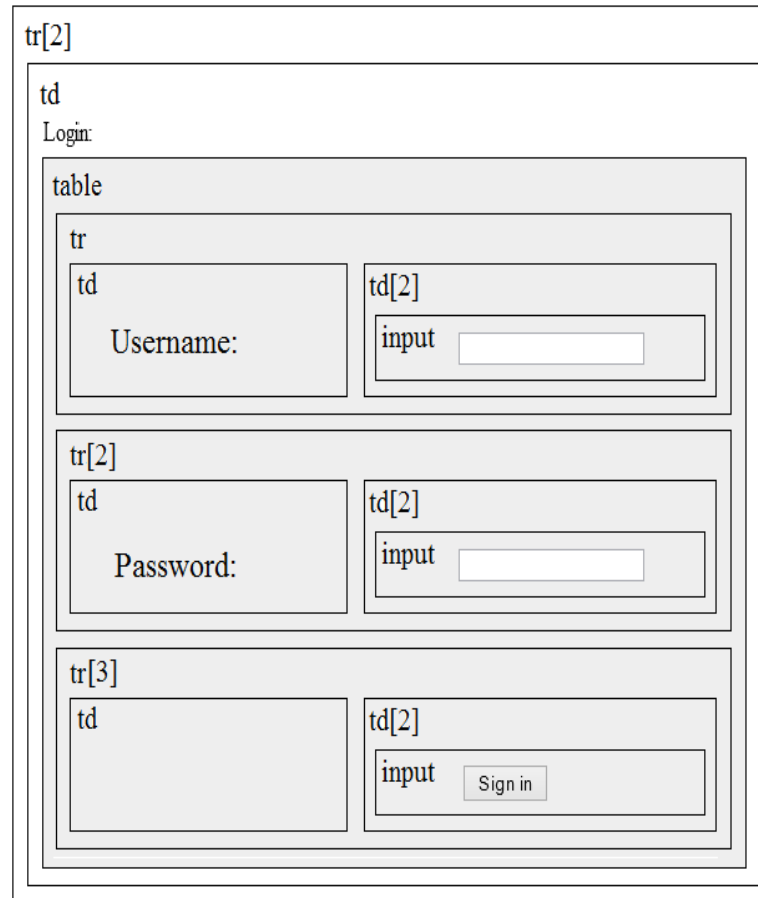


Process Overview (1. Detection)

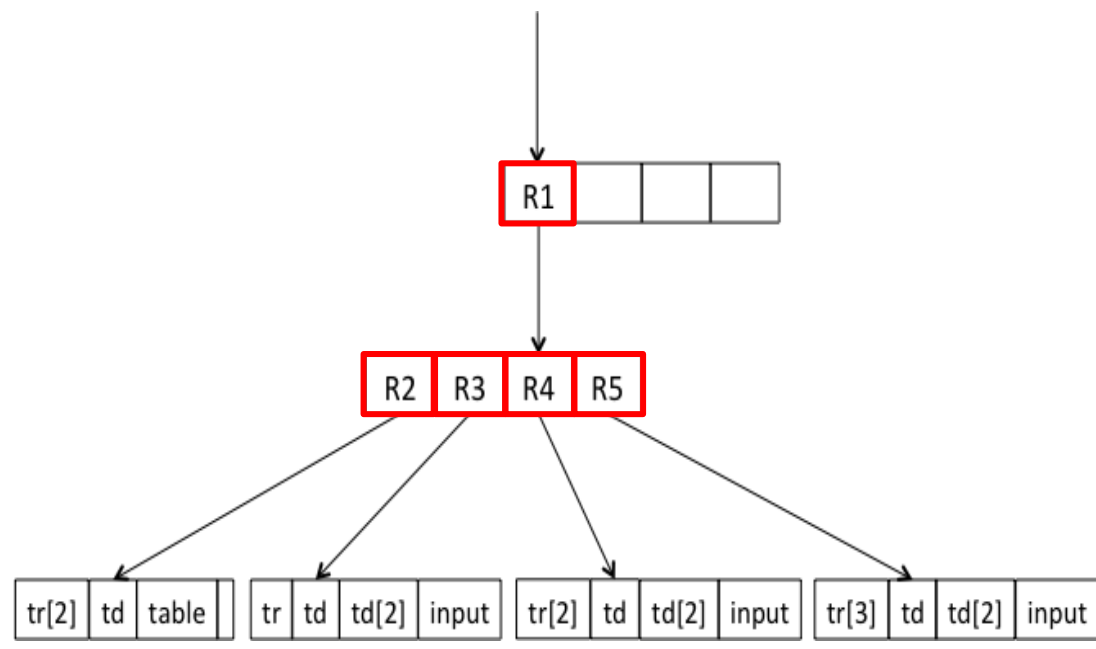
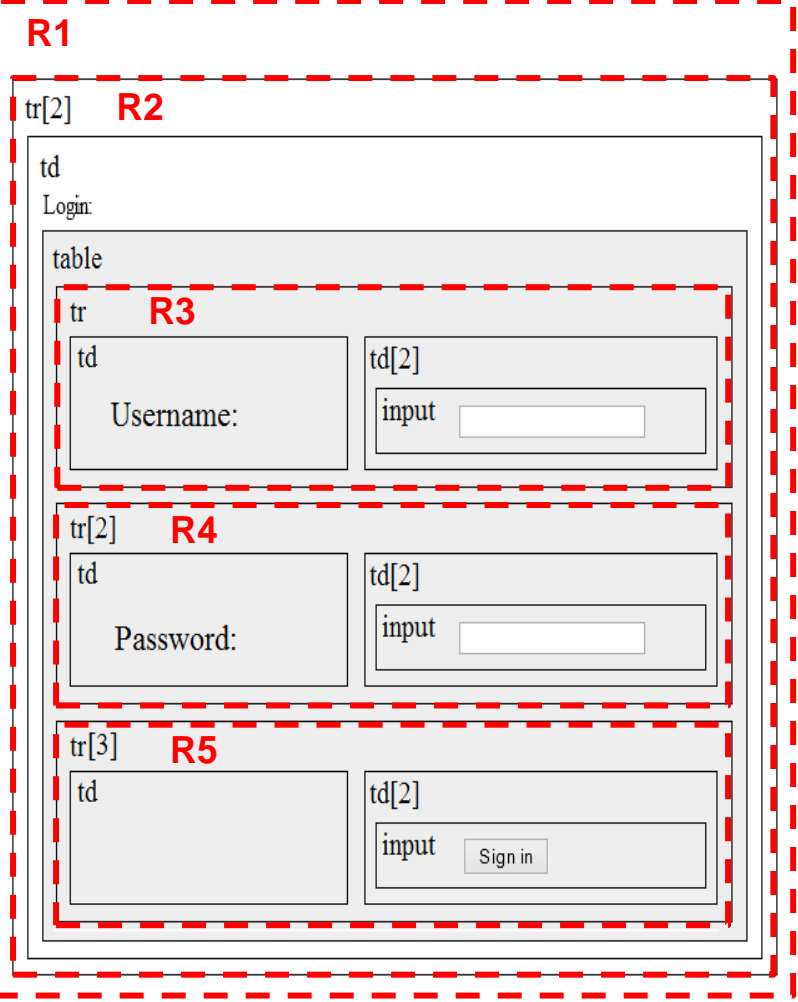


Test web page <http://www.usc.edu> Application starting (DEBUG mode) [\[Link\]](#)

Process Overview (2. Localization)



Process Overview (2. Localization)



Sub-tree of R-tree

Process Overview (2. Localization)

tr[2]

Result Set:

/html/body/.../tr[2]

/html/body/.../tr[2]/td[1]

/html/body/.../tr[2]/td[1]/table[1]

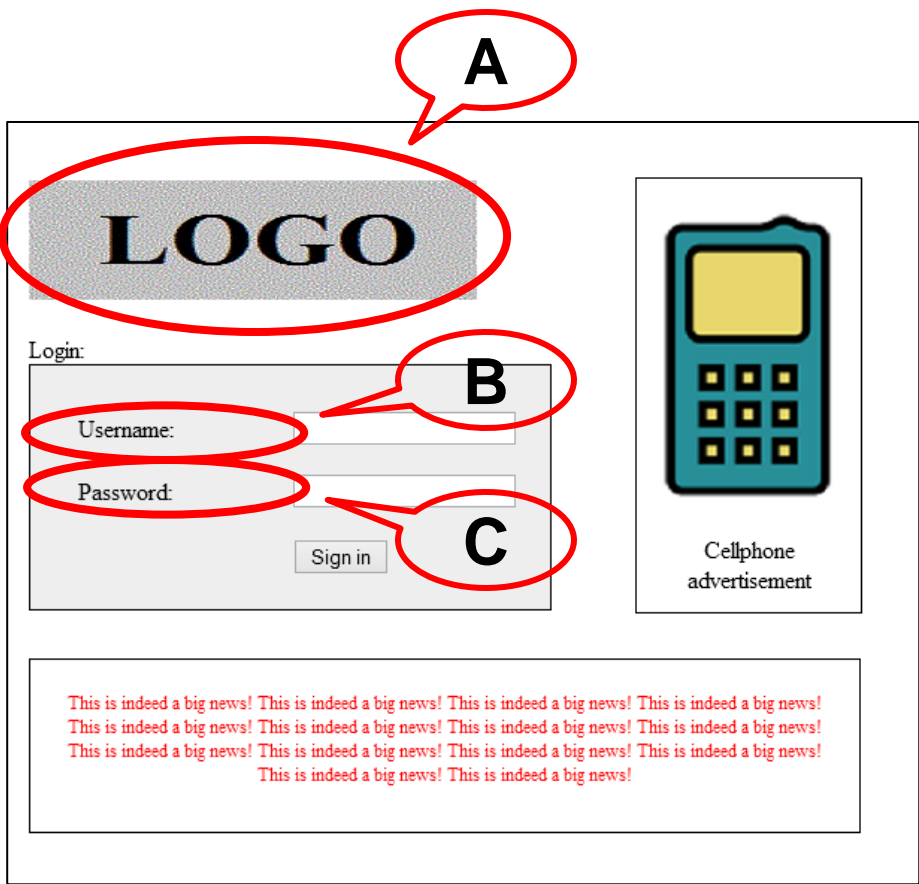
/html/body/.../tr[2]/td[1]/table[1]/tr[1]

/html/body/.../tr[2]/td[1]/table[1]/td[1]

input

Map pixel visual differences to HTML elements

Process Overview (3. Result Set Processing)



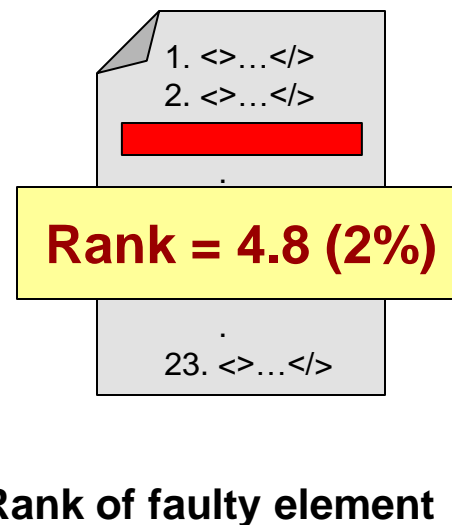
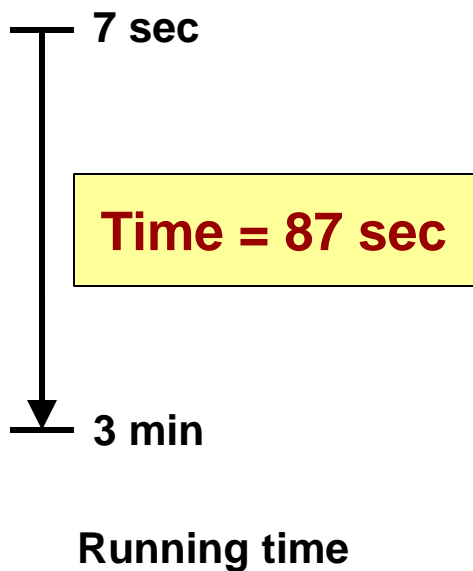
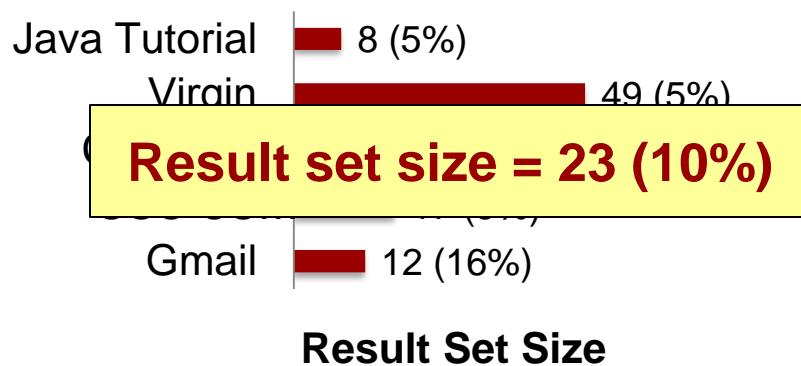
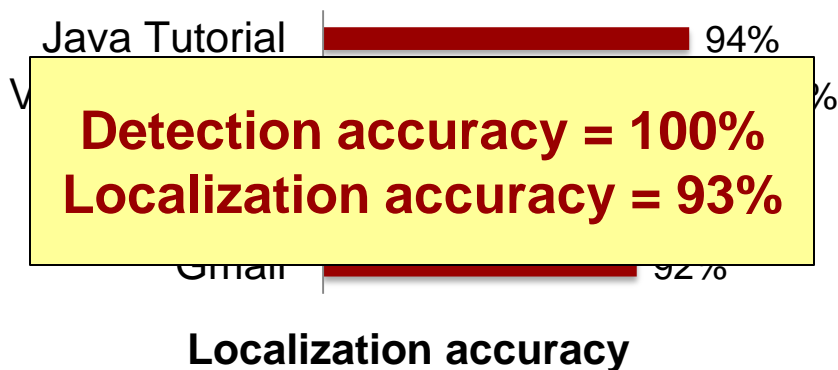
Report

Cluster A
/html/body/table/.../img
/html/body
/html/body/table
:
5. /html/body/table
6. /html/body
/html/body/table/.../img
7. /html

Cluster B

Cluster C

Empirical Evaluation



Demo

1. Regression Debugging

- Current version of the web app is modified
 - Refactor HTML (e.g. convert `<table>` to `<div>` layout)
- Seed two presentation failures

2. Mockup Driven Development

- Front-end developers convert high-fidelity mockups to HTML pages
- Use real-world mockup

Thank you

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<https://github.com/sonalmahajan/websee>

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