CrowdStudy: General Toolkit for Crowdsourced Evaluation of Web Interfaces

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CrowdAdapt
Crowdsourced Adaptation of Web Sites for Additional Viewing Contexts [EICS’13a]

CrowdTouch/W3Touch
Crowdsourced Evaluation and Adaptation for Touch [CHI’13]

CrowdDesign
Crowdsourced Web Engineering and Design [ICWE’12]

CrowdStudy
Crowdsourced Web Site Evaluation [EICS’13b]
Problem

• Typically ad-hoc solutions are required for user testing of specific sites

• Existing usability evaluation frameworks limited in terms of
  – Issue Detection, e.g. only for WCAG
  – User Activity and Interaction Tracking Techniques

• No comprehensive support for
  – Evaluation under different use contexts
  – Subject recruitment, task distribution, etc.
CrowdStudy

User Study Engine

CrowdStudy

Task 1
Task 2
...

Measurements
User Feedback

Users/Workers
Proposed Framework

Remote Usability Testing Framework

Tasks
- Design
- Publishing
- Distribution
- Assignment

Design-time
Run-time

Metrics

Admin Tools
- Crowd-sourcing
- Context-Awareness

Feedback Report
Log Analysis
Data Visualisation
Abstract User Study Model

1. Begin
   1.1 Instructions
   1.2 Qualification

2. Tasks
   2.1 Task 1
   2.2 Task 2...

3. Next…/Finish
   3.1 Feedback
   3.2 Next…/Finish
# Representation of Tasks

Task $T = < \text{precon, action+}, \text{postcon} >$

<table>
<thead>
<tr>
<th>Pre-condition</th>
<th>E.g., require other tasks to be completed first</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Based on instructions, may be scripted or defined by using pre-defined classes</td>
</tr>
<tr>
<td>Post-condition</td>
<td>E.g., select appropriate next task depending on previous result</td>
</tr>
</tbody>
</table>
Example Studies

CrowdAdapt Tasks

- Design
- Compare
- Evaluate

Feedback

End

W3Touch Tasks

- Qualification
- Click Link
- Find Link
- Read Text
- Describe Image

Feedback

End
W3Touch

W3 Touch Tasks

Click Links

- Please click the highlighted link.
- tasks to complete: 25

Find Links

- Please find and click the link within the article text that has a black border.
- tasks to complete: 23

Read Text + Questions

- Please read the highlighted piece of text!
- tasks to complete: 33
W3Touch Data Visualisations

Script
### Classification of Metrics

<table>
<thead>
<tr>
<th>Device-related Metrics</th>
<th>User-related Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time-based Metrics</td>
<td>Counter-based Metrics</td>
</tr>
<tr>
<td>Interaction-based Metrics</td>
<td>User Ratings and Comments</td>
</tr>
</tbody>
</table>
Integration with MTurk

Landing Page

User Study

Questionnaire

HIT Submission

Amazon Mechanical Turk

CrowdStudy

assignmentId
Hi there!

Thank you for agreeing to participate in this study.

You'll be asked to...

--- TASKS ---

<a href="javascript:" class="crowdstudy-link" id="link1">Link 1</a>
<a href="javascript:" class="crowdstudy-link" id="link2">Link 2</a>
<a href="javascript:" class="crowdstudy-link" id="link3">Link 3</a>

Read this text...

Find me

--- CROWDSTUDY ---

<p class="input end-of-section">Please provide feedback in terms of the 10 short questions below!</p>

<form action="response.php" method="post" onsubmit="return true;">

<h4>Use of touch devices</h4>

<p class="question">1. How often do you use your touch device(s)?</p>

<table border="0" cellpadding="7" cellspacing="0">
  <tr>
    <td>several times a day</td>
    <td>once a day</td>
    <td>several times a week</td>
    <td>once a week</td>
    <td>less than once a week</td>
  </tr>
  <tr>
    <td><input type="radio" name="device_usage" value="5"></td>
    <td><input type="radio" name="device_usage" value="4"></td>
    <td><input type="radio" name="device_usage" value="3"></td>
    <td><input type="radio" name="device_usage" value="2"></td>
    <td><input type="radio" name="device_usage" value="1"></td>
  </tr>
</table>

--- LINKS ---

Please click the highlighted link.

--- QUESTIONS ---

Use of touch devices

1. How often do you use your touch device(s)?
Conclusions

• General and extensible Framework for Web Site Evaluation and Remote Usability Testing
  – Support for Context-Awareness
  – Integration with Crowdsourcing Services

• New Enabling Concepts
  – Abstract User Study Model
  – Formalised Representation of Tasks
  – Extensible Set of Metrics
Admin Tools

Log Analysis

Feedback Report
CROWDSOURCED ENGINEERING OF WEB USER INTERFACES
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CrowdAdapt Tasks
- Design
- Evaluate
- Compare

Parallel Design

Iterative Design

CrowdAdapt
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W3Touch Tasks
- Click Links
- Find Links
- Read Text +

CrowdAdapt
Metrics-based Web Page Adaptation for Touch [CHI '13]

Remote Usability Testing Framework

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Model

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Publication Component

Discovery and Inspection

Reuse

Sharing and Reuse

Community-based Component Library

Publication Component Specification

Publication Component

Landing Page User Study Questionnaire HIT Submission

Amazon Mechanical Turk

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Assignment

CrowdStudy

Michael Nebeling, Maximilian Speicher and Moira C. Norrie: CrowdAdapt: Enabling Crowdsourced Web Page Adaptation for Individual Viewing Conditions and Preferences (EICS 2013)

Michael Nebeling, Maximilian Speicher and Moira C. Norrie: CrowdStudy: General Toolkit for Crowdsourced Evaluation of Web Interfaces (EICS 2013)


Michael Nebeling, Stefania Leone and Moira C. Norrie: Crowdsourced Web Engineering and Design (ICWE 2012)