Emotions and Oracles

Michael Bolton
http://www.developsense.com

Rapid Software Testing
To be able to test a product when it has to be tested right now, under conditions of uncertainty, in a way that stands up to scrutiny.

Skill + Heuristics makes testing powerful

This...

A heuristic is a fallible method for solving a problem.

...not this.

Most conventional wisdom about testing is empty folklore (yes, Agile Testing too)

Oracles

An oracle is a heuristic principle or mechanism by which someone might recognize a problem. (usually works, might fail)

Hey! Testing isn’t just a clerical process!

Bug (n): Something that bugs someone who matters (but not decide conclusively)
Oracles

- When something is okay, it's because an oracle says so.
- When something is wrong, it's with respect to some oracle.

Consistency ("this agrees with that")

an important theme in oracles

- History
- Image
- Comparable Products
- Claims
- User Expectations
- Purpose
- Product
- Standards

Consistency heuristics rely on the quality of your models of the product and its context.

Noticing Problems

- We run the program, and to some, it seems like we just notice problems as we go along.
- Noticing problems is a very logical, objective, dispassionate process.

One Way of Thinking of Testing

Give me only programmers to test my code!
Hey... how come we have 650 open reqs for SDET*s?
And how come everybody gripes about security and usability?

* SDET = “Software Development Engineer in Test”
Besides… Automation Can’t…

<table>
<thead>
<tr>
<th>reframe</th>
<th>refine</th>
<th>investigate</th>
<th>predict</th>
<th>speculate</th>
</tr>
</thead>
<tbody>
<tr>
<td>empathize</td>
<td>anticipate</td>
<td>judge</td>
<td>predict</td>
<td>suggest</td>
</tr>
<tr>
<td>recognize</td>
<td>appreciate</td>
<td>refocus</td>
<td>how</td>
<td>evaluate</td>
</tr>
<tr>
<td>become resigned</td>
<td>chart</td>
<td>assess</td>
<td>get frustrated</td>
<td></td>
</tr>
<tr>
<td>teach</td>
<td>learn</td>
<td>model</td>
<td>make conscious decisions</td>
<td></td>
</tr>
<tr>
<td>invent</td>
<td>think</td>
<td>resource</td>
<td></td>
<td></td>
</tr>
<tr>
<td>troubleshoot</td>
<td>collaborate</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Machines Don’t Get Aroused

No, not THAT kind of arousal.

Arousal (n.): a physiological and psychological state of being awake. Important in regulating consciousness, attention, and information processing.

Machines are cool…

- …but they **don’t** get aroused.
- That is, they don’t notice problems…
- …and they can’t even try.

Skilled testers don’t think “pass or fail”?

Skilled testers ask “is there a **problem** here”?

Machines and automated tests don’t even know to ask.

Examples of Common Cognitive Biases

- Fundamental Attribution Error
  - things are absolutely so, ignoring context
- Anchoring Bias
  - overcommitting to an idea
- Automation Bias
  - machines are better than people
- Reification Error
  - treating ideas, constructs, and people as objects
How Do People React to Software?

Confusion
Surprise
Frustration
Impatience
Amusement
Annoyance

Using Emotion To Help Overcome Bias

- Your biases may cause you to miss bugs
- An emotional reaction is a trigger to learning
- Without emotion, we don’t reason well
  - check the psych literature
- When you find yourself mildly concerned
  about something, someone else could be very
  concerned about it

Emotional Triggers

- Impatience ⇒ an intolerable delay?
- Frustration ⇒ a poorly-conceived workflow?
- Amusement ⇒ a threat to someone’s image?
- Surprise ⇒ inconsistency with expectations?
- Confusion ⇒ unclear interface? poor testability?
- Annoyance ⇒ a missing feature?
- Boredom ⇒ an uninteresting test?

Our clients are human

- Our humanity as testers helps to reveal important
  information about our products.
- Emotions provide a rich source of oracles—
  principles or mechanisms by which we recognize
  problems.
- I’ll wager that any time we’ve seen a bug, our
  emotions were a big factor in recognizing or
  interpreting it.
- Why do so many in our profession seem to be so
  oblivious to the value of emotions?