

## Emotions and Oracles

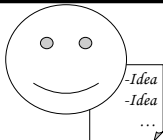
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## Rapid Software Testing

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.

1. Do this
2. Then do this
3. Then do this
4. Then do this
5. And then this...

Hey! Testing isn't just a clerical process!

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

## Oracles

An oracle is

a heuristic

(usually works, might fail)

principle

or mechanism


by which

someone

might recognize

(but not decide conclusively)

a problem.

 **Bug (n):** Something that bugs someone who matters

## Oracles

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

**You're blind to a problem  
if you don't have an oracle for it.**

## 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.

**Isn't it?**

## 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?

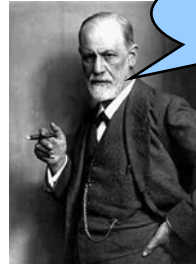
\* SDET = "Software Development Engineer in Test"

## Besides... Automation Can't...

reframe refine investigate speculate  
empathize anticipate predict suggest  
recognize refocus judge project  
appreciate collaborate  
become resigned evaluate  
teach learn charter assess  
invent work around a problem get frustrated  
model make conscious decisions  
troubleshoot collaborate resource

**THINK**

## 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?



Impatience



Frustration



Amusement



Surprise



Confusion



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

An emotion is a signal; consider looking into it

## Emotional Triggers

**What might they be telling us?**

- 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?