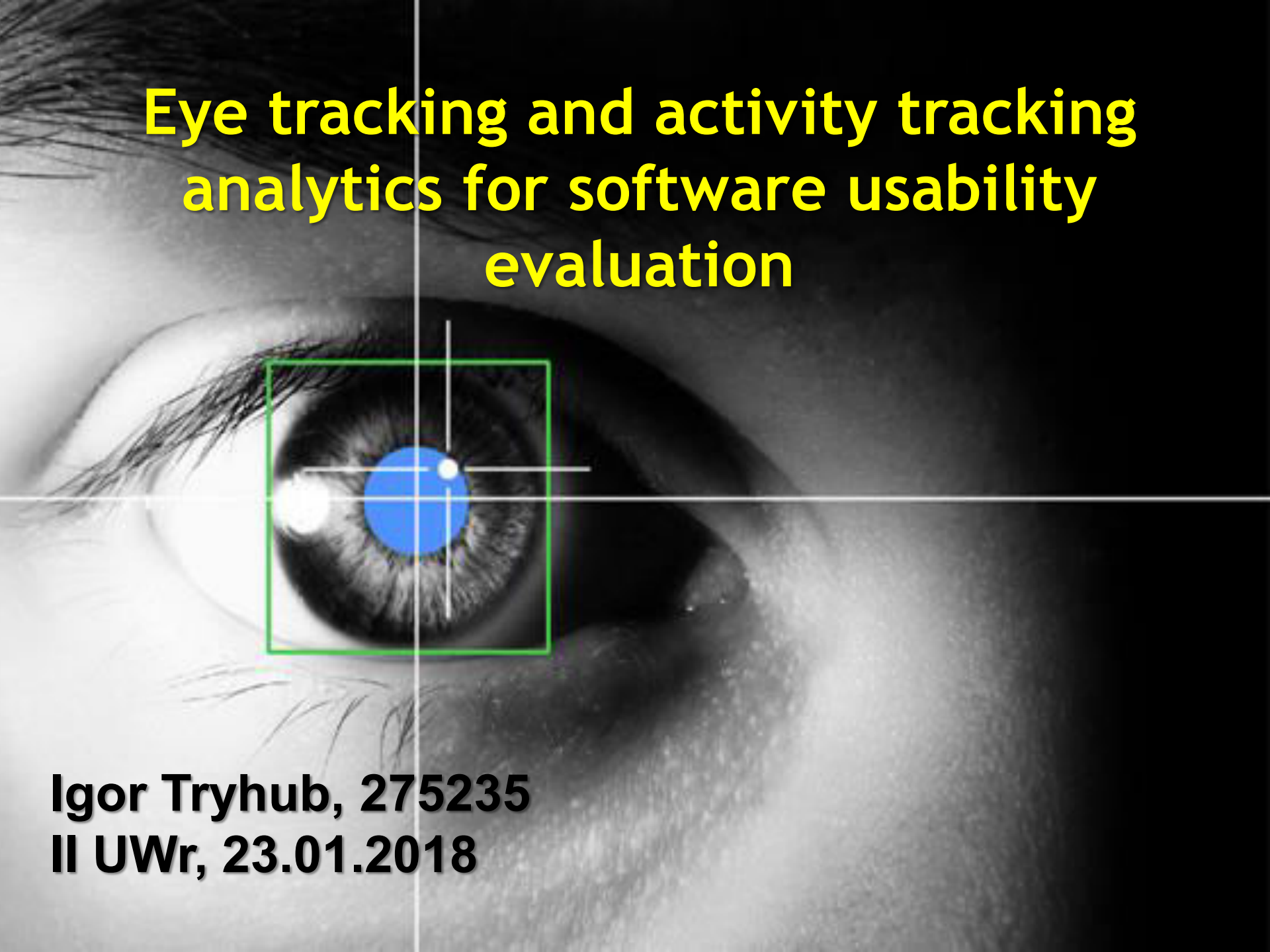
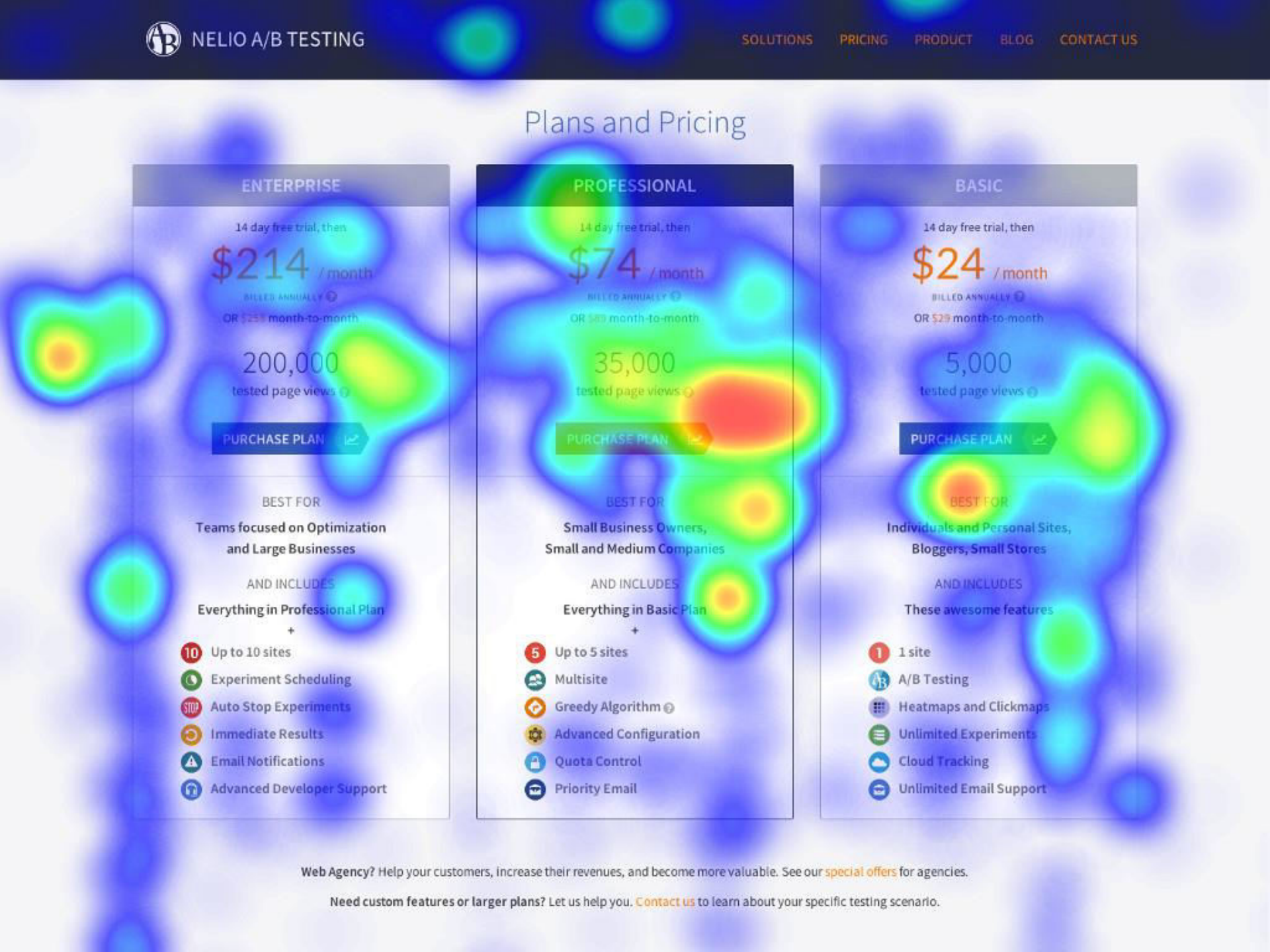
Eye tracking and activity tracking analytics for software usability evaluation



Igor Tryhub, 275235
II UWr, 23.01.2018

Why even bother?

- Boringly unpleasant large dataset of numbers
- Traditional data visualizations do not fill all problematic holes
- How can we correctly understand data?
- How can we be sure that our research is valid?
- Usability test: “I wish we could see what he saw.”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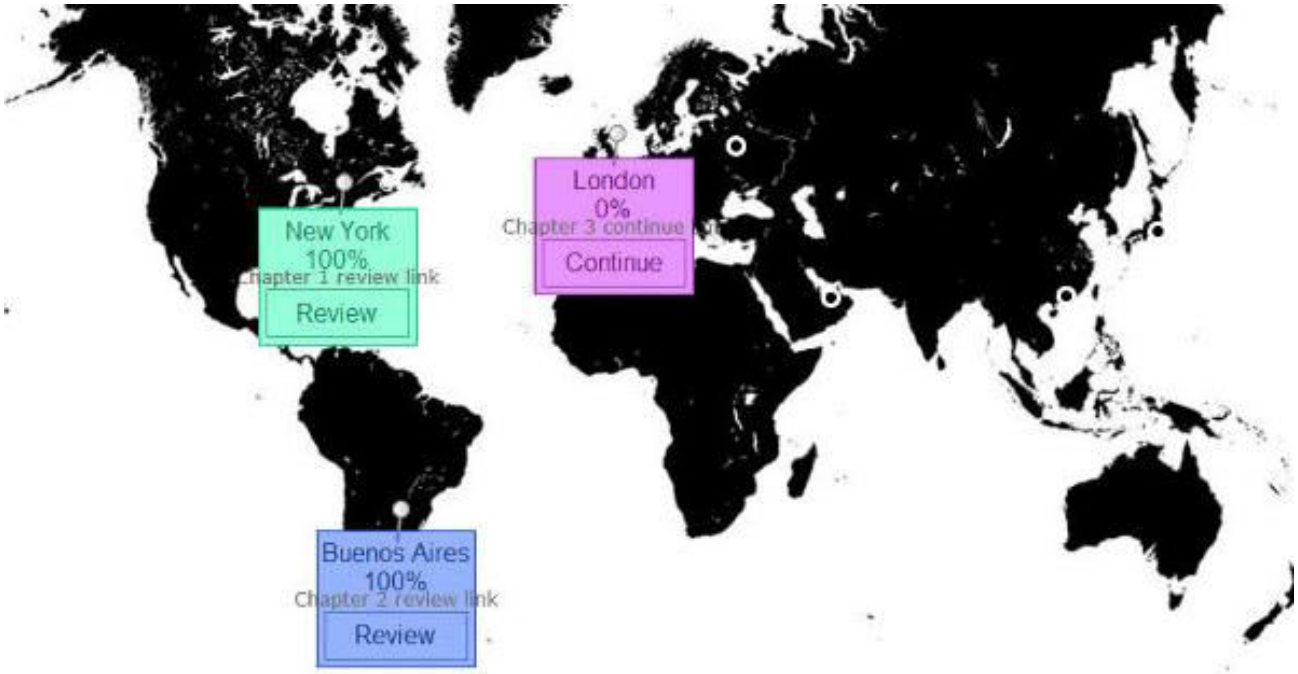
Web Agency? Help your customers, increase their revenues, and become more valuable. See our special offers for agencies.
Need custom features or larger plans? Let us help you. Contact us to learn about your specific testing scenario.

Case study #1

- Scalding hot button case study:
  - A heat map has shown interest, but it did not show that there was sheer confusion of users.

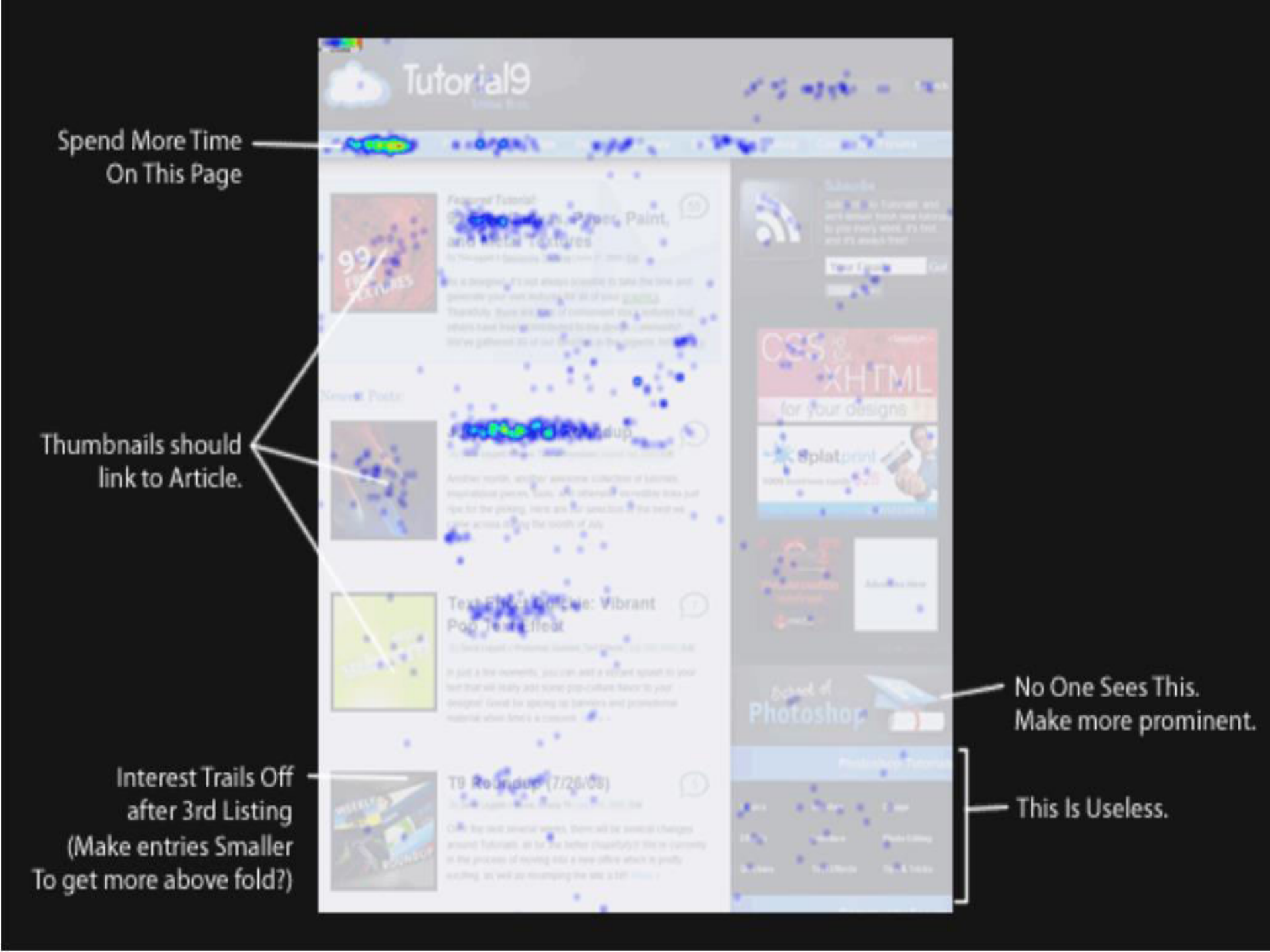
Case study #2

- 50% starting screen conversion rate due to unclicked “Review” button



Heat maps

- Show the density of clicks in given areas
- Are NOT separate from the environment of the whole website or web app:
  - ‘Look at this, this button gets clicks! WE NEED MORE BUTTONS!’
- Useful for pointing you in the right direction, but are not enough to work on improving the UX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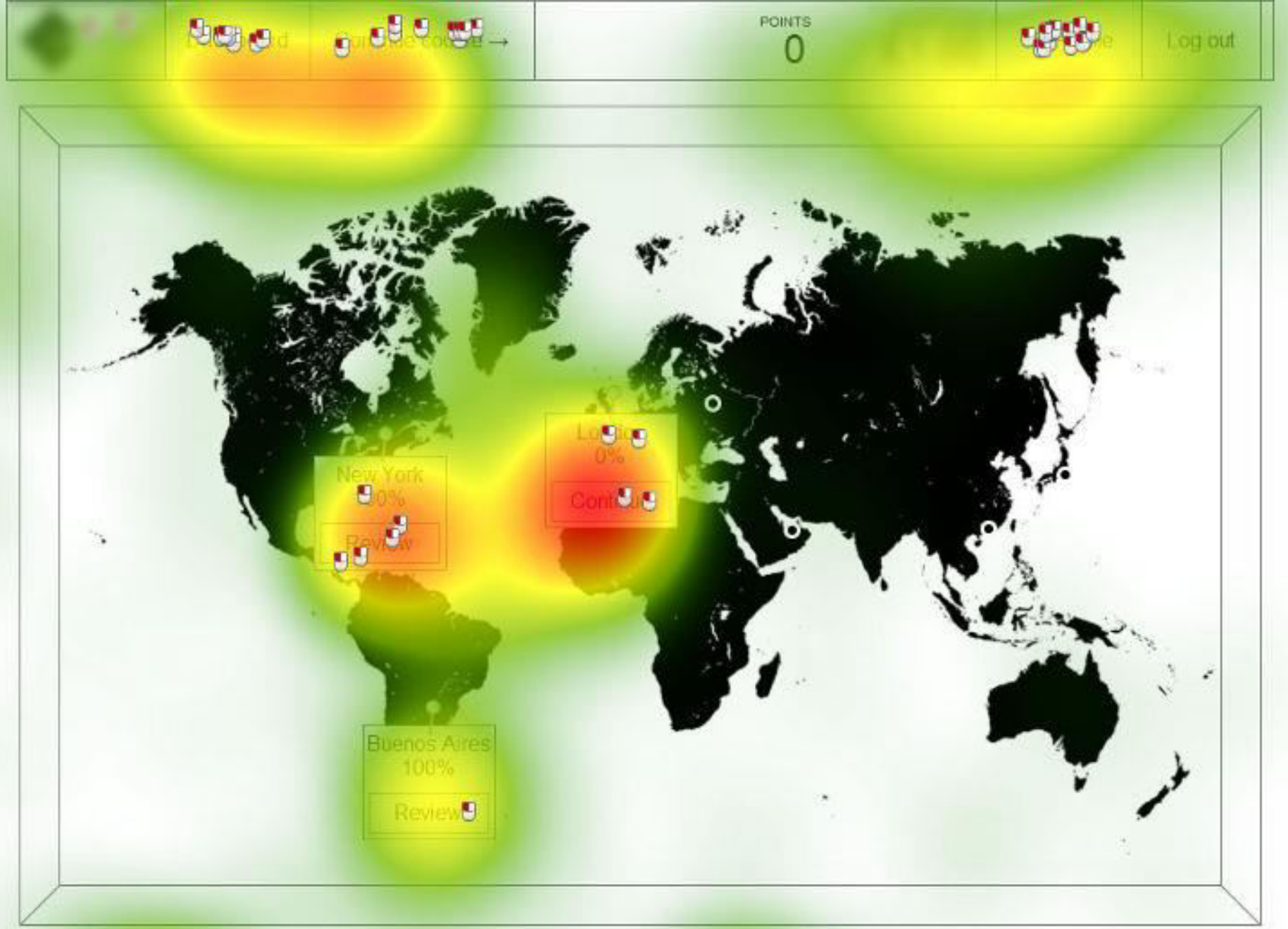
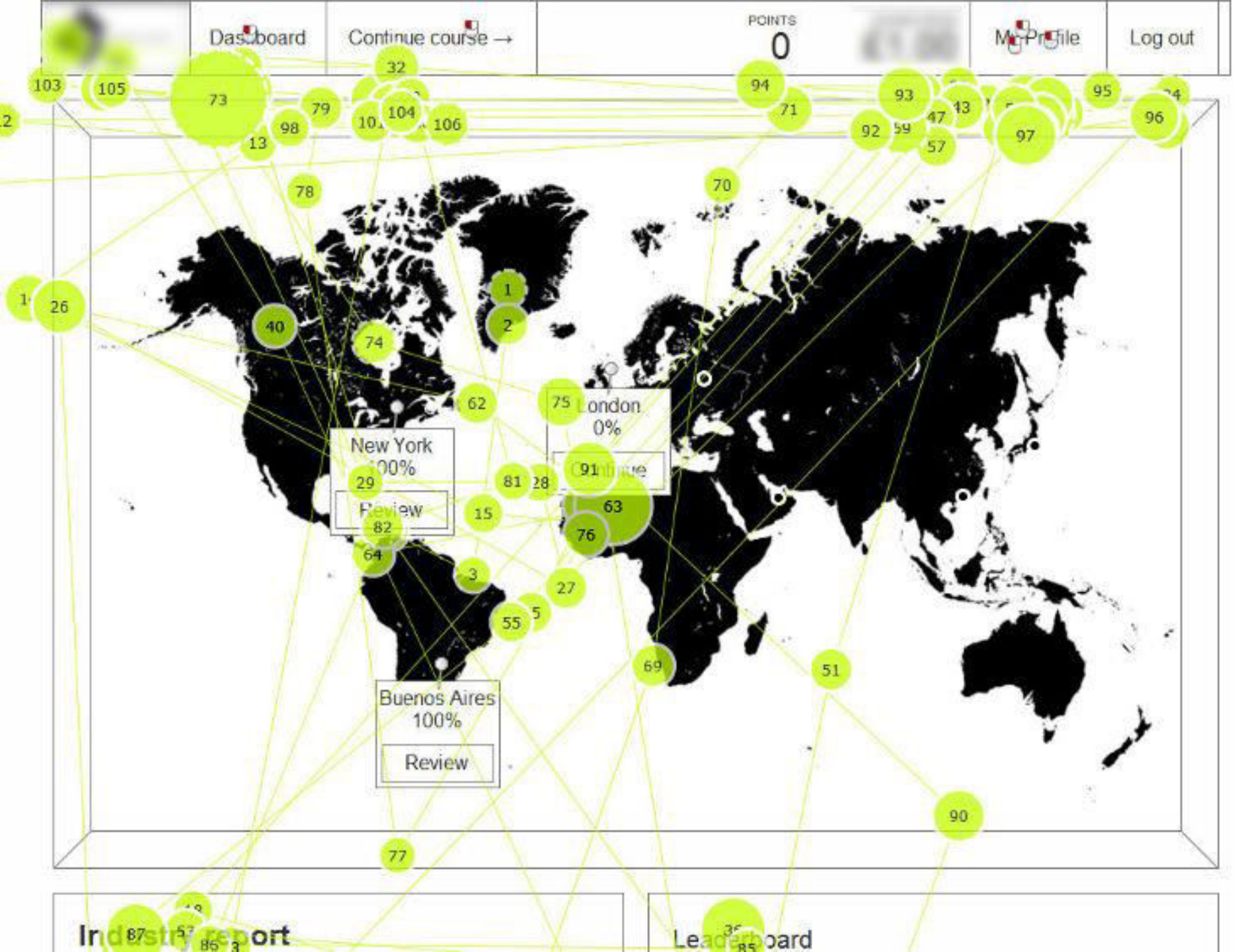
Make more prominent.
This Is Useless.



Industry report

Leaderboard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Review
Industry report
Leaderboard

Eye tracking: history

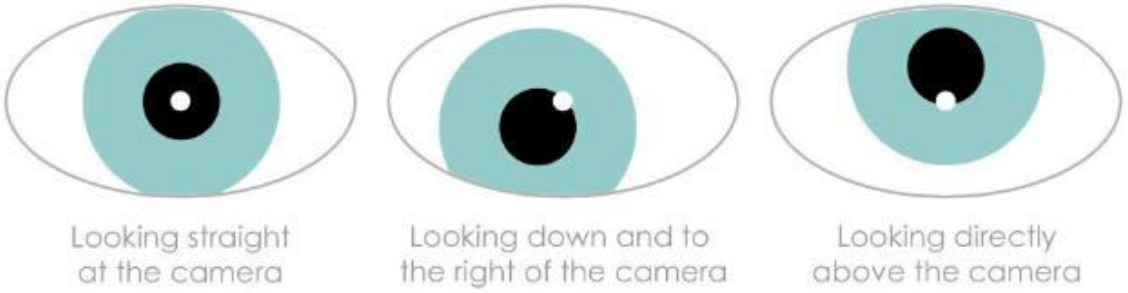
- 1980's: marketing groups began measure the effectiveness of ads in magazines.
- 1990: used on fans viewing of professional football games to determine what parts of the game the typical watcher missed.
- Late 1990s: organizations began to measure and study reactions to information on the WWW.
- 2001: Tobii Technology has been developing technology that both allows disabled users to control devices using only their eyes, and helps designers understand how users view websites.
- Today: widely used in the scientific community, marketing, and in usability studies.

Why it works

- Foveal vision vs. Peripheral vision
- The really high-resolution area covers only about 2 degrees of the visual field.
- Fixations and saccades.
- The Mind-Eye hypothesis: what people are looking at and what they are thinking about tends to be the same.

How it works

- Averages calculations for the two eyes.
- Bounce a beam of invisible infrared light off the user's face to identify position of the pupils without intense image recognition.



- Finds the intersection between the gaze direction and the plane of the computer monitor.
- Artificial intelligence to perform image recognition in a non-computer environment.

Exposed behavior

- An ordered list of fixations (and an unordered list of overlooked elements)
- The time taken to arrive at any given fixation
- The length of any given fixation
- The number of fixations per element

Eye tracking tools

- EyeTech
- Mirametrix
- SMI
- Tobii

Problems

- Cost ($1,000-$10,000)
- Limited Scope
- Behind every impressive demonstration is hours of effort and interpretation
- High Observer Effect (The Hawthorne effect)

The Hawthorne effect

- The experiments took place at Western Electric's factory at Hawthorne, a suburb of Chicago, in the late 1920s and early 1930s.

Mouse tracking

- It is cheaper
- It is a passive form of study – users have no idea they are being tracked
- Eyes cannot click – and a mouse does: deliberate click on an element is a form of showing interest
- Can be collected accurately, easily, remotely, and on a large scale, using Javascript

But how comparable are the methods?

- There is an 84% – 88% correlation between eye movement and mouse movement
- Recent paper from Google claims that eye movement is only 32% similar to mouse movement

Google study

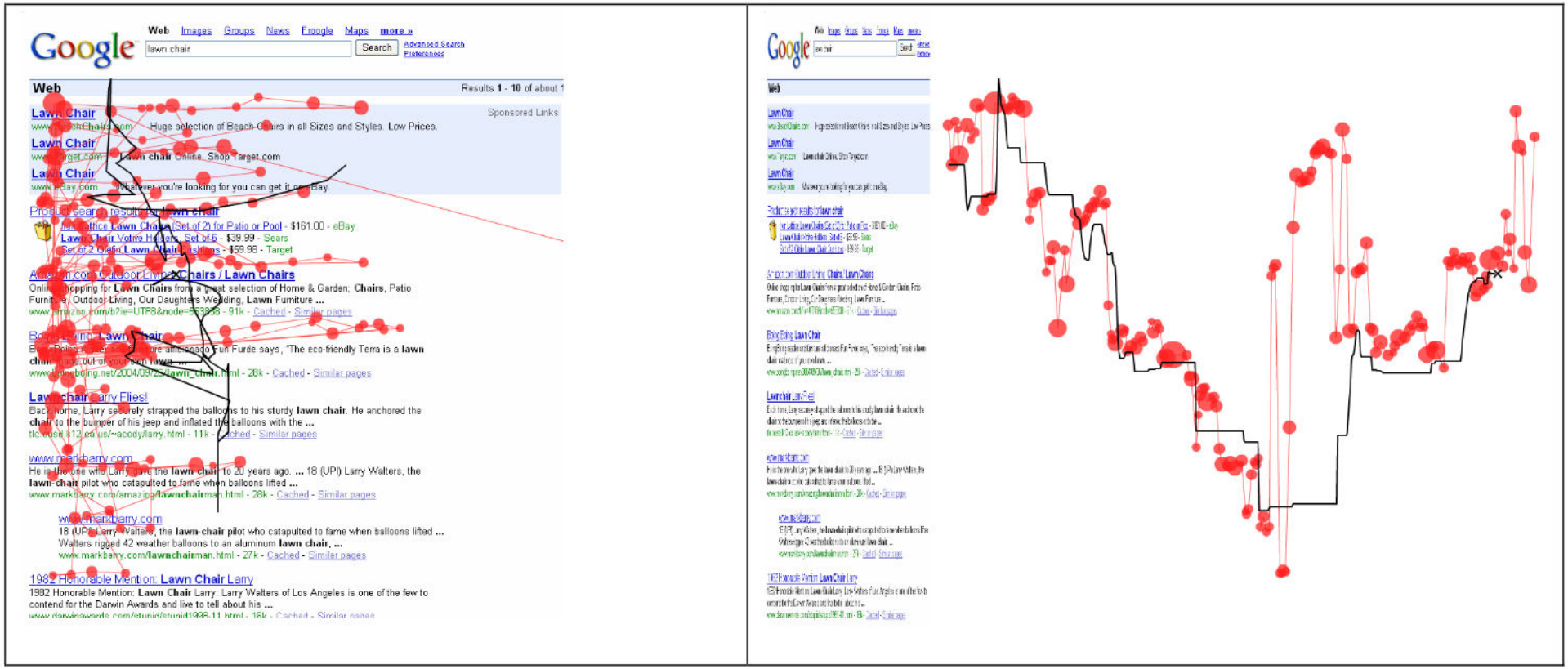
- 32 participants
- It seems that the mouse does not become actively used until the user has moved past this first part of the page
- Discovered 3 patterns of active mouse usage:
  - following the eye vertically with the mouse (32%)
  - following the eye horizontally with the mouse (10%)
  - using the mouse to mark a promising result (16%)
- Some users use the mouse pointer to help them read the page, or to help them make a decision about where to click

Incidental mouse usage

Mouse following the eye horizontally

Using the mouse to mark a promising result

Mouse following the eye in the vertical direction



Session Recording

- Swipes
- Clicks
- Movements
- Highlights
- Interactions
- Browsing paths

A/B testing

Click rate: 52 %

72 %

Session recording tools

- ClickTale – an enterprise option for recording sessions:
  - Expansive, large, advanced. The only con is pricing.
- VWO – an A/B testing software that also offers session recording for variants.
- UsabilityTools – capable of reproducing the user screen and actions in one hundred percent faithfulness:
  - Offers a free trial for two weeks and has a cheap monthly subscription.

Bibliograpy

- https://usabilitygeek.com/
- http://www.uxbooth.com/articles/a-brief-history-of-eye-tracking/
- https://www.tobiipro.com/
- https://www.clicktale.com/
- https://vwo.com/
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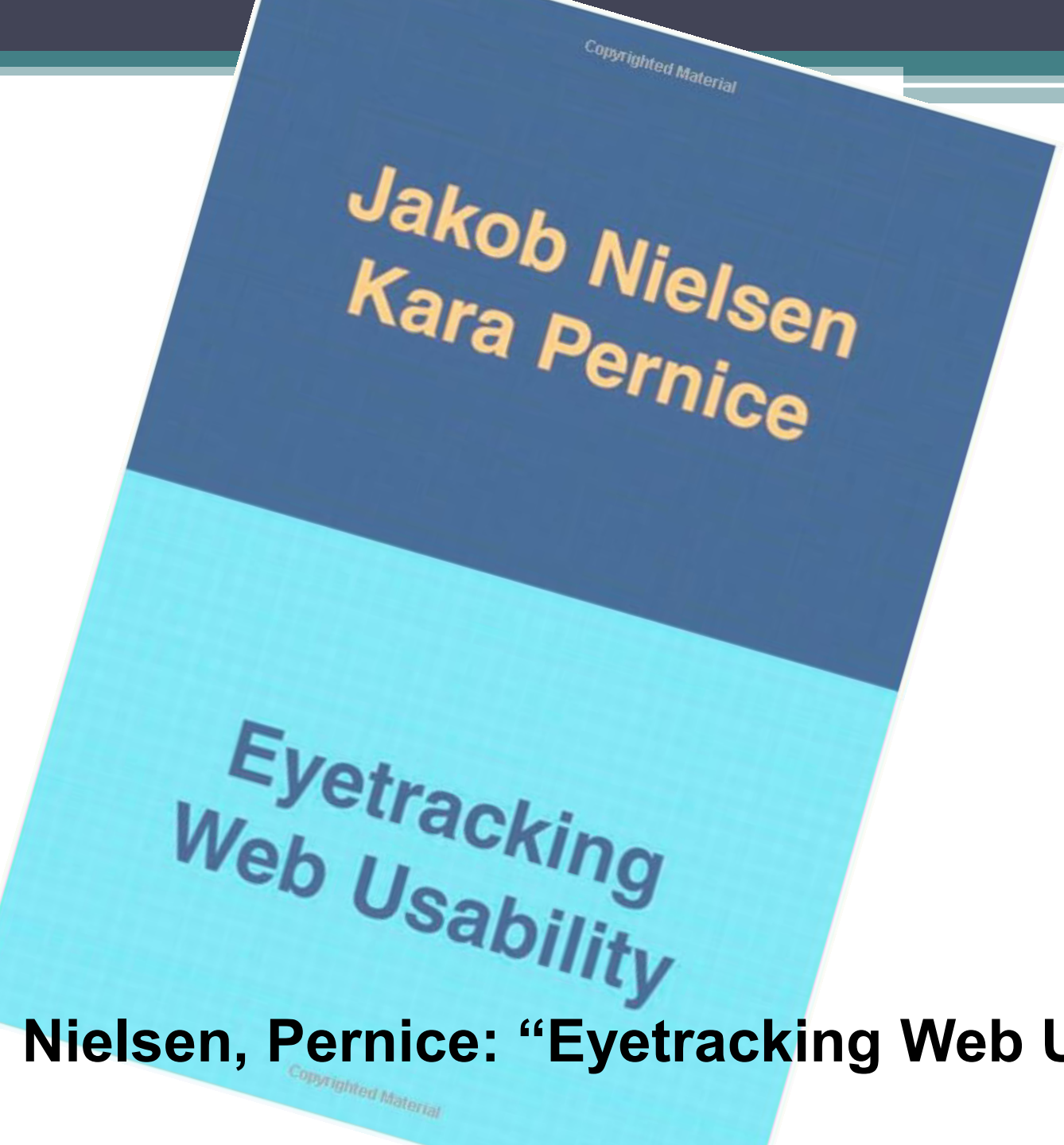

Nielsen, Pernice: “Eyetracking Web Usability” (2009)