



Exploring the Uses of Eye-tracking
To Evaluate Usability and Guide Design Decisions

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Common Misconceptions About Eye-tracking

Isn't eye-tracking very complicated?

Isn't it uncomfortable for participants?

Eye-tracking requires a lot of data analysis.

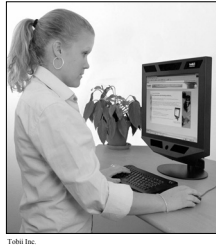
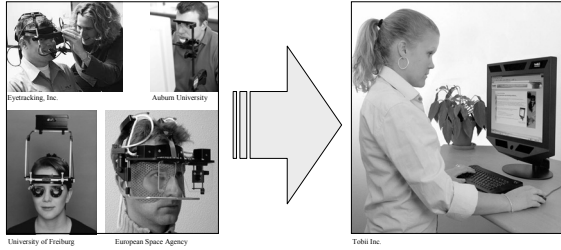
Eye-tracking can't tell us anything we don't already know.

2



Eye-tracking Technology

Eye-tracking Technology Past & Present



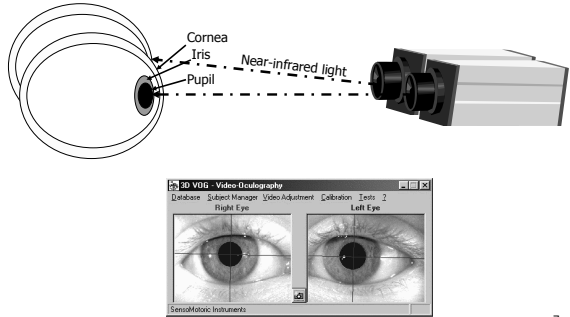
Eye-tracking Technology Today

- Highly accurate
- Short calibration time
- Completely non-intrusive
- Little training required
- Immediate results

How Eye-tracking Works

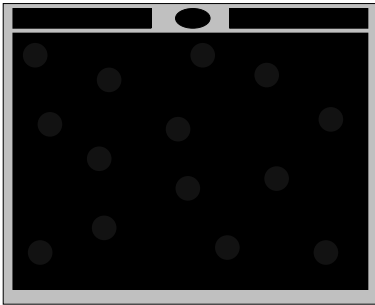


How Eye-tracking Works



7

User Calibration



8

Tools for Analyzing the Data



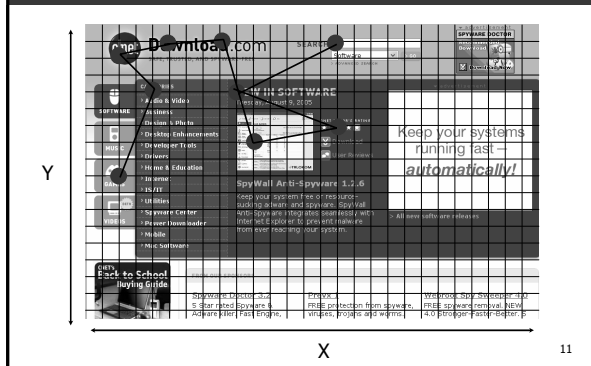
Raw Data Captured by Eye-tracker*

- Time of fixation
- Duration of fixation
- Horizontal & Vertical Coordinates
- Pupil size
- Screen recording
- Keyboard & mouse clicks

*Raw data may vary depending on model used.

10

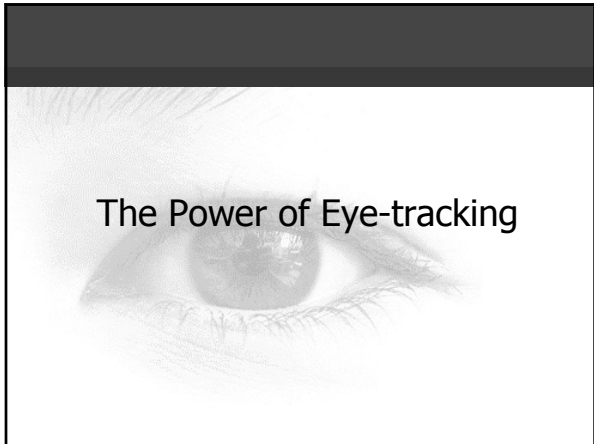
Eye-gaze Paths Demonstration



Eye-gaze Paths Example

Video depicting significant eye movement with short and long fixations.

12



The Power of Eye-tracking

Analyzing User Behavior

- Analyze Web reading behavior
- Identify difficult or confusing elements
- Watch duration of attention
- Measure efficiency
- Measure learnability

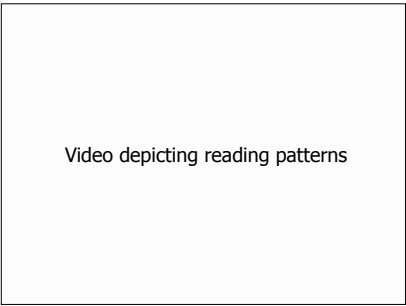
17

Analyzing Web Reading Behavior

A neutrino is an electrically neutral particle.

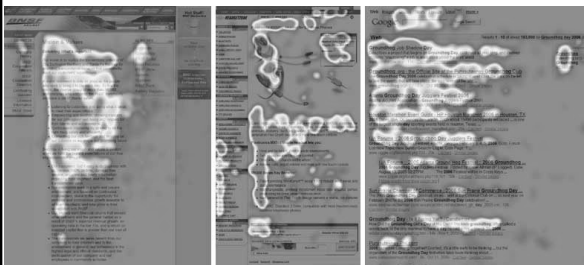
18

Analyzing Reading Behavior



19

The F Pattern



20

Improving Design Effectiveness

- Watch Real-time design feedback
- Test visual design hierarchy
- Compare different versions of a design
- Understand what attracts users
- Evaluate user interest

21

Analyzing Visual Design

Video depicting problems with form layout or visual design issues

22

Analyzing Visual Design

Finding: On homepages, top navigation captures more views than left or right navigation.

<i>Navigation-placement statistics</i>			
Navigation placement >>>>>>>>>>>>	Left	Right	Top
% seeing navigation	52.5	60.4	70.4
Avg. time to first view of nav (seconds)	9.7	17	6.2
Avg. duration of viewing nav (seconds)	1.1	1.4	2.3
% clicked on nav	17.8	18.8	21.8
% of total page clicks on nav	8.4	4.5	14

Courtesy of The Poynter Institute

23

Analyzing Visual Design

Finding: The placement of a series of consecutive radio buttons appeared to cause confusion for some users.

Restaurant Location:

1st Choice Reservation Time: AM PM

2nd Choice Reservation Time: AM PM

Smoking preference: No Smoking Smoking No Preference

Seating preference: Indoor Outdoor No Preference

Send Confirmation via: E-mail Phone Fax

E-mail (optional):


Mobile telephone (optional):

Fax number (optional):

24

Adding to the Usability & Designer Toolbox

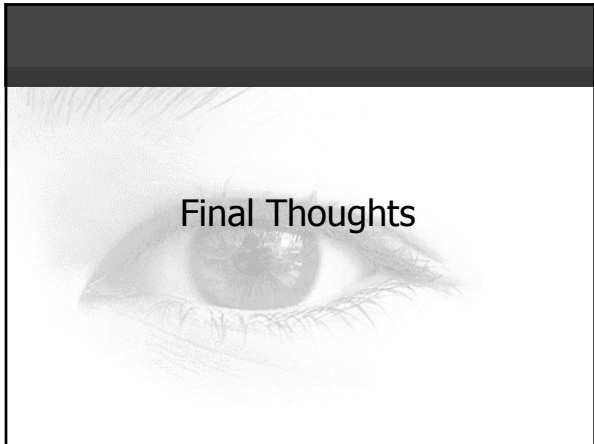
- Eye-tracking should not be used as a standalone activity
- Use as part of an iterative design process
- Have clear objectives and questions
- Always interpret in context of task
- Use automatically generated deliverables to support findings



Issues with Eye-tracking

Things to be Aware Of

- Some people can unknowingly be poor participants
- Inaccuracies in or loss of data capture can be caused by environmental factors
- Misinterpretation of data by researcher



Future Trends in Eye-tracking

- Increased accuracy; support for wider audience
- Reduced or no calibration time
- Improved methodologies; standards, good practice guidelines
- Better software
 - Non-proprietary
 - More automated data analysis functions
 - Increased integration between data collected from eye-tracker and other sources

29

Additional Resources

- Tobii
 - www.tobii.com
- LC Technologies
 - www.eyegaze.com
- faceLAB
 - <http://www.seeingmachines.com/facelab.htm>
- Poynter Institute
 - www.poynterextra.org/eyetrack2004/

30

