Introduction

Eyetracking at the ACT Technology Coordination Branch

Until recently, eye-tracking hardware had to be worn by the test subject which was bulky, heavy, and uncomfortable, especially in the case of bite bars, used to keep the subject's head still, or devices which forced the test subject to lie down with their head in a plastic tunnel similar to a CT scan.

The ACT Technology Coordination Branch uses a much more sophisticated eye-tracker that records eye gaze data from a small camera embedded into the bottom portion of a computer monitor. The eye-tracker uses near infrared diodes to generate reflection patterns on the corneas of the user. Image processing algorithms in the software identify relevant features of the eyes and corneal reflection patterns. Complex mathematics then calculate the 3D position of each eye-ball to determine the gaze point on the screen.

Head-mounted Eyetracking system

NATO OTAN

CogSci projects are sponsored and coordinated by:

Allied Command Transformation

C4I Division
Technology Coordination Branch (TCB)

7857 Blandy Road, Suite 100
Norfolk, VA 23551-2490
http://tide.act.nato.int
Help: 757.747.3868

NATO OTAN ALLIED COMMAND TRANSFORMATION
A new day ahead. A new way ahead.

Eyetracking

Seeing the World Through the Users' Eyes

Cognitive Science and Usability Experimentation

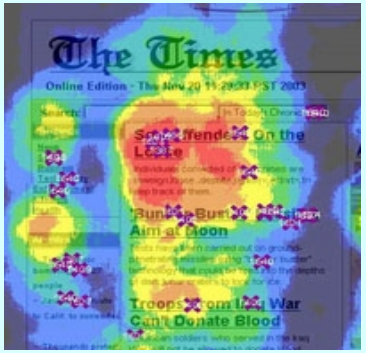
Eyetracking…

- Tracks where a person's eyes look while reading
- Combines data from multiple test subjects to discover representative patterns

Eyetracking helps to improve interface design by providing data about…

- Cognitive science processes surrounding critical decision making
- Visual attention
- The usability of current and developing decision support systems
- User-unfriendly and unintuitive design areas

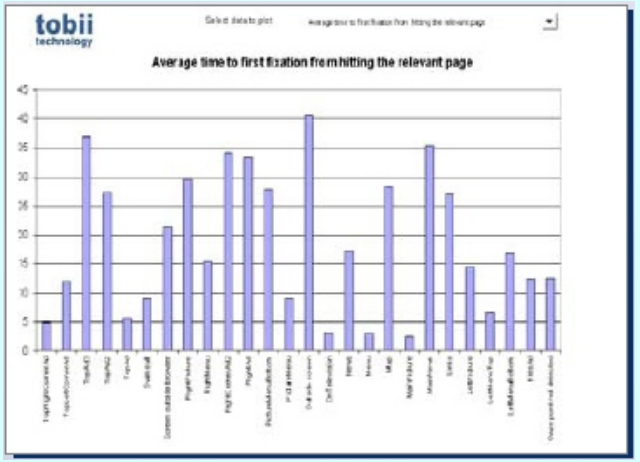
Eyetracker Data Visualization



Hotspot Map

Provides an overall view of activity on a page by displaying areas on the screen where users have…

- **focused attention**
- **scanned thoroughly**
- **scanned briefly**
- **completely ignored**



Statistics Chart

Enables greater qualitative interpretation. This graph displays the average time until the first fixation on a specific web page.

Gaze Replay and Plot

- Circles show points of fixation where the user halted his or her gaze for at least a fraction of a second
- Lines between the circles represent "saccades", which are rapid, intermittent eye movements
- Numbers on the circles represent the "scan path", or sequence of the user's fixations on the page.
- Saccades and fixations on the pages can also be viewed as video, which also displays mouse movements