

# Barbara Barclay

General Manager, Tobii North America

LEAD SPONSOR



SUPPORTING SPONSORS

**Alcon**

**CareCredit**  
25 Years of Caring.

**DAC**  
VISION

**LUXOTTICA**

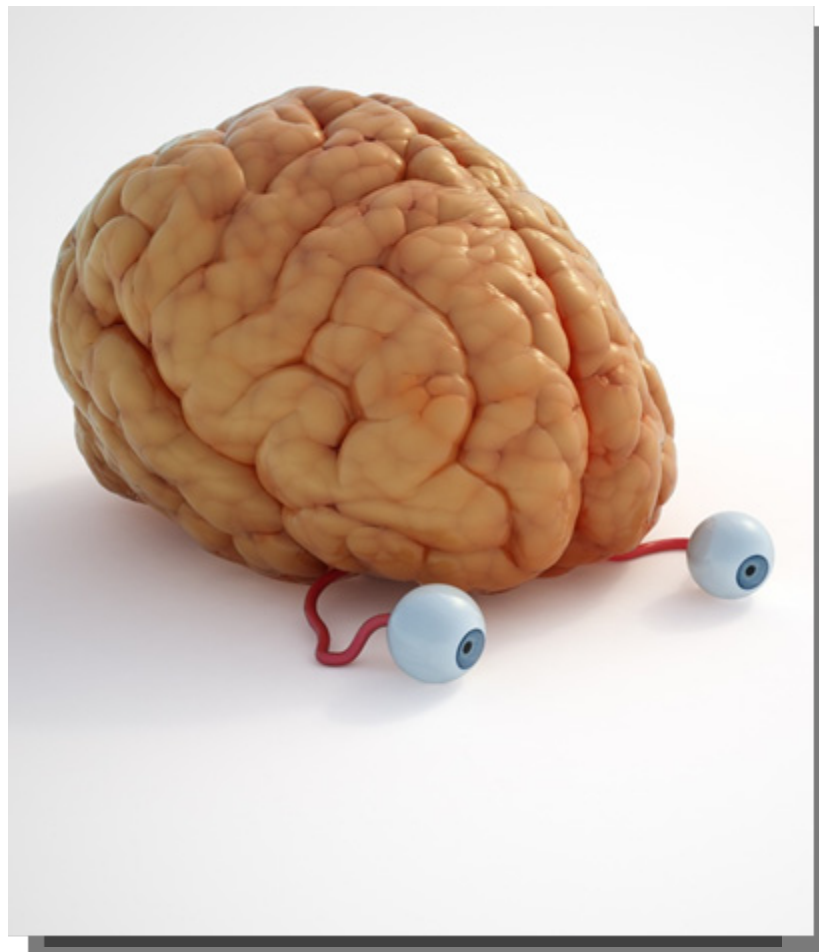
  
**SHAMIR**

**INTERNATIONAL  
VISION  
EXPO**  
& CONFERENCE  
NEW YORK

# Vision Monday Leadership Summit

Barbara Barclay, Tobii Technology, Inc.

# The eyes are the mirror of the mind



# Agenda

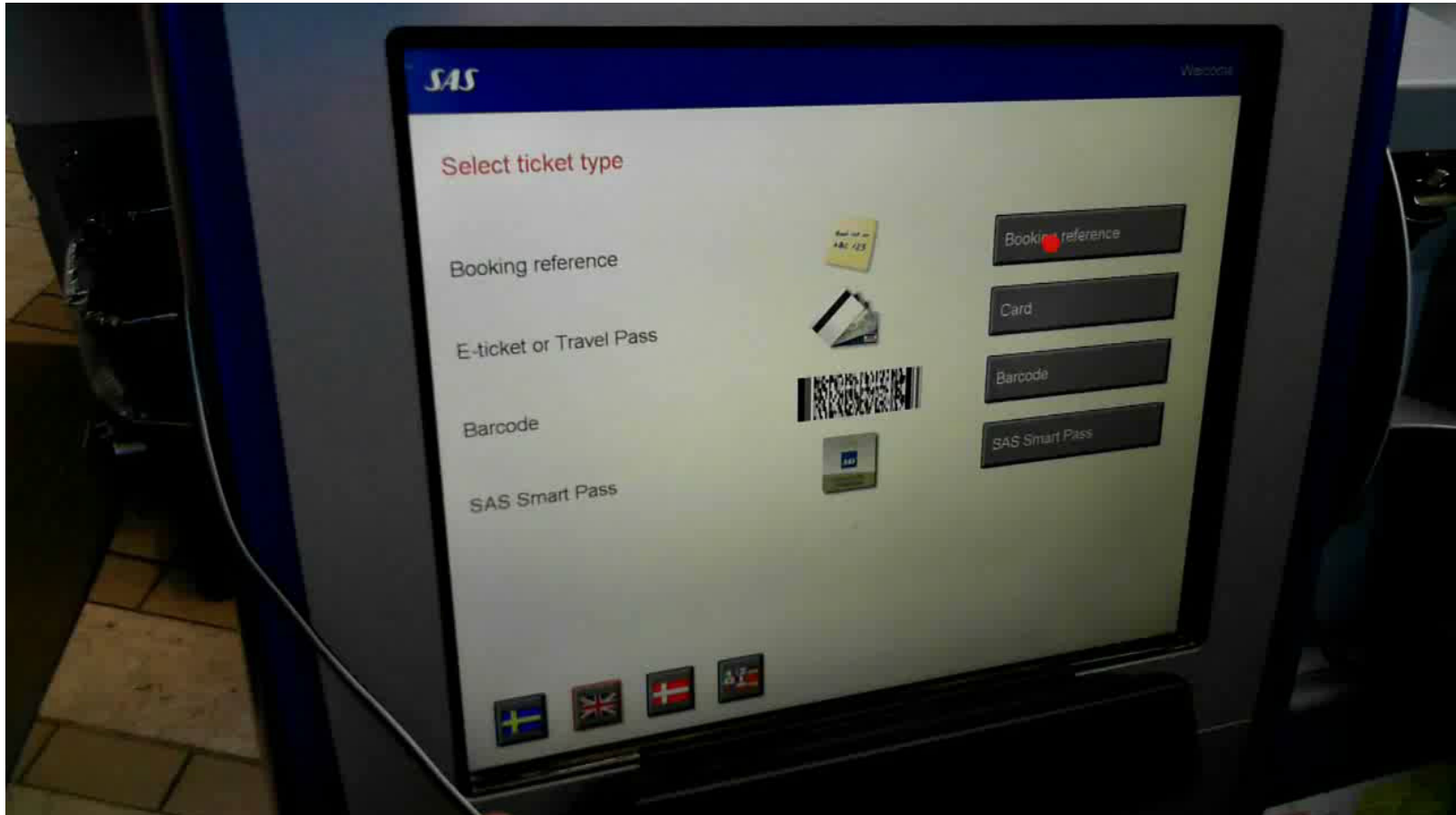
- What is eye tracking?
- Who is Tobii Technology?
- How will Eye Tracking Affect Your Business?
- Applications in Eye Tracking Research
- Gaze Interaction and the Future of Eye Tracking

# What is Eye Tracking

✓ **When** and **where** you look for **how long**



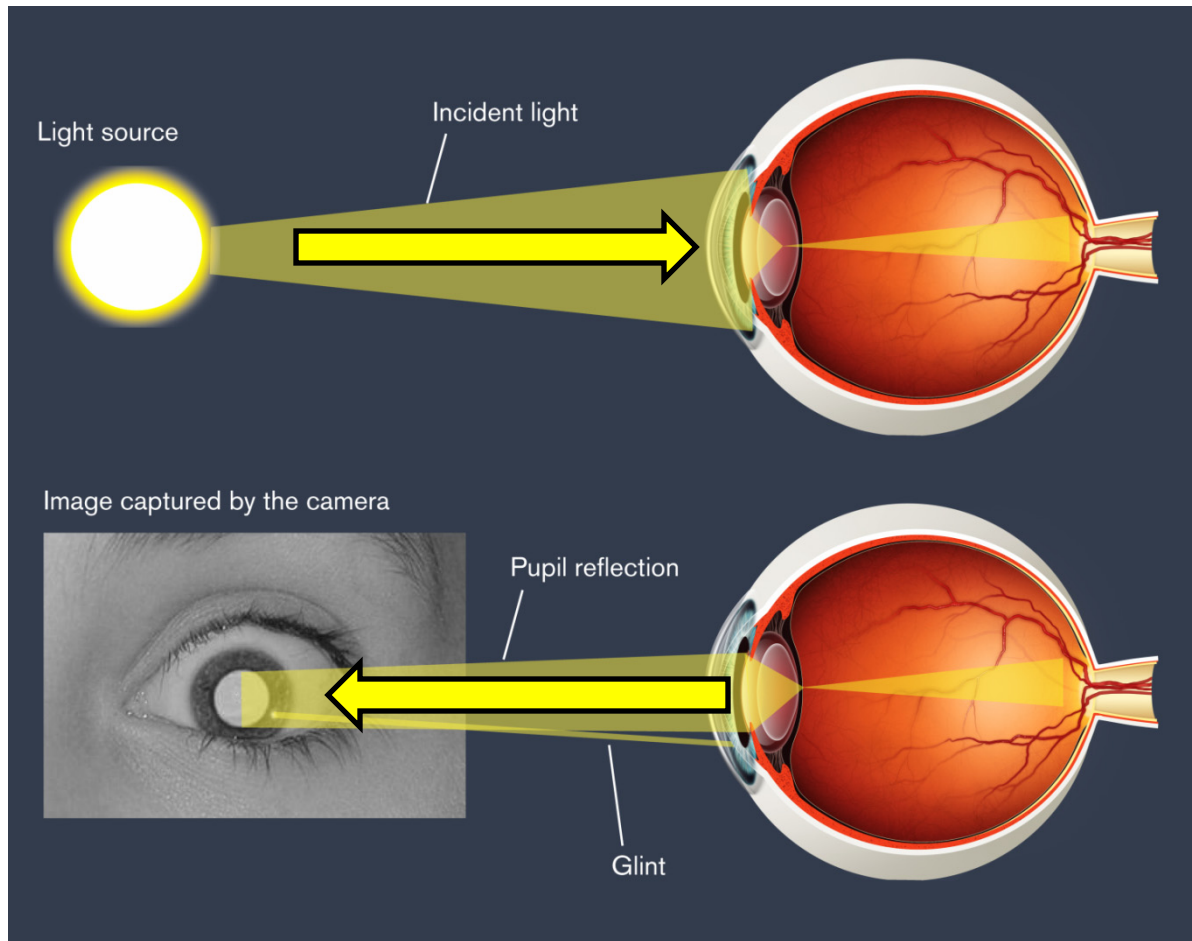
# Portable eye tracking – airport kiosk



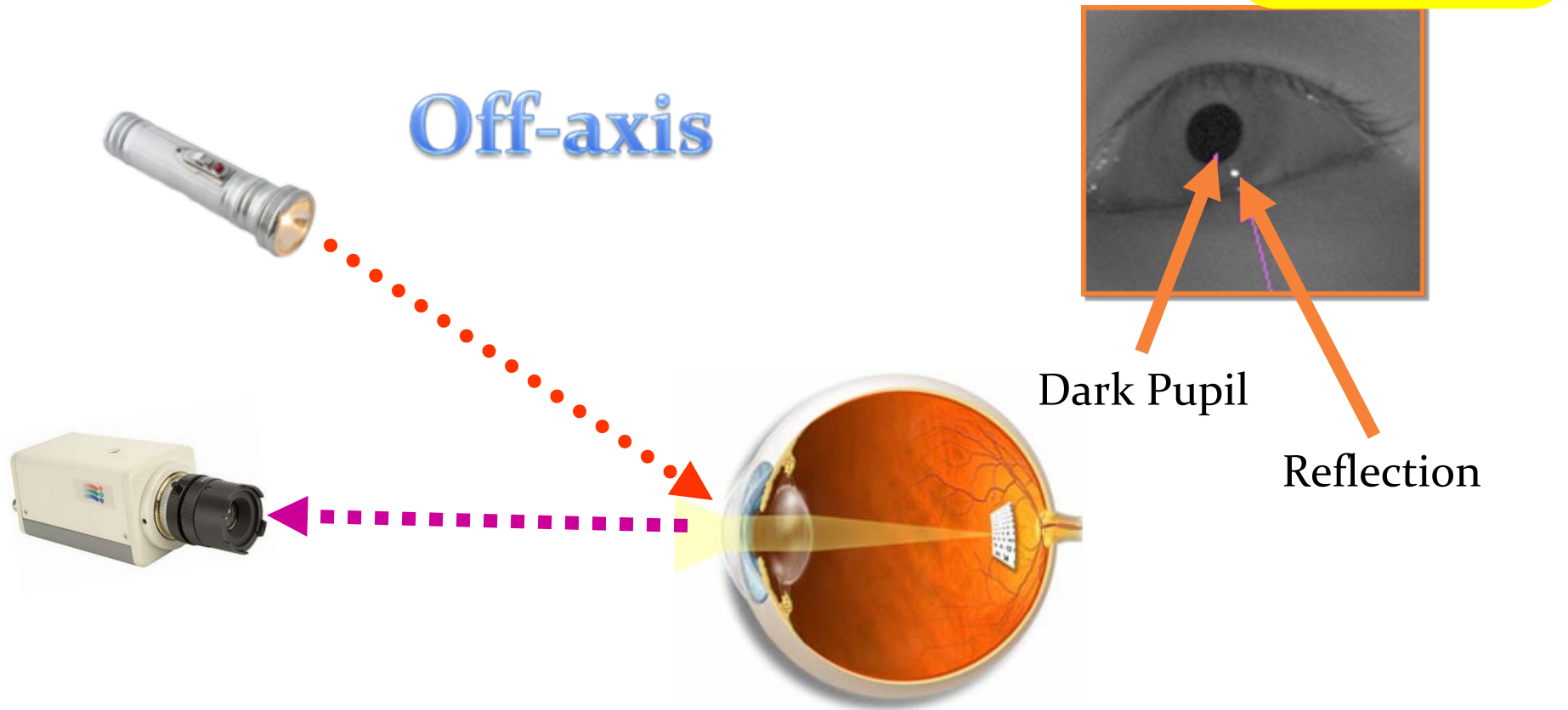
# Shallow dive into the technology



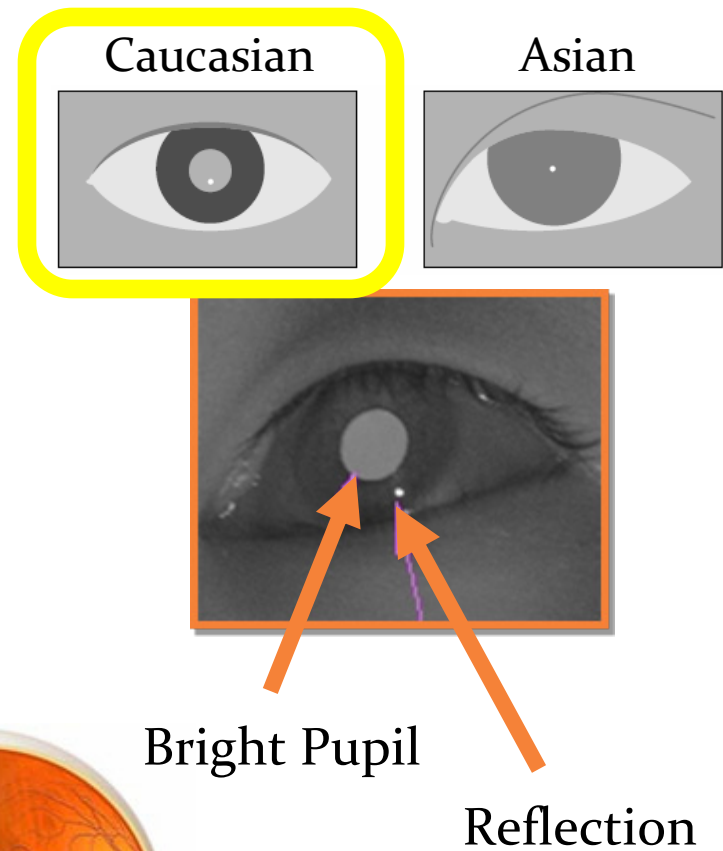
# Pupil Centered Corneal Reflection



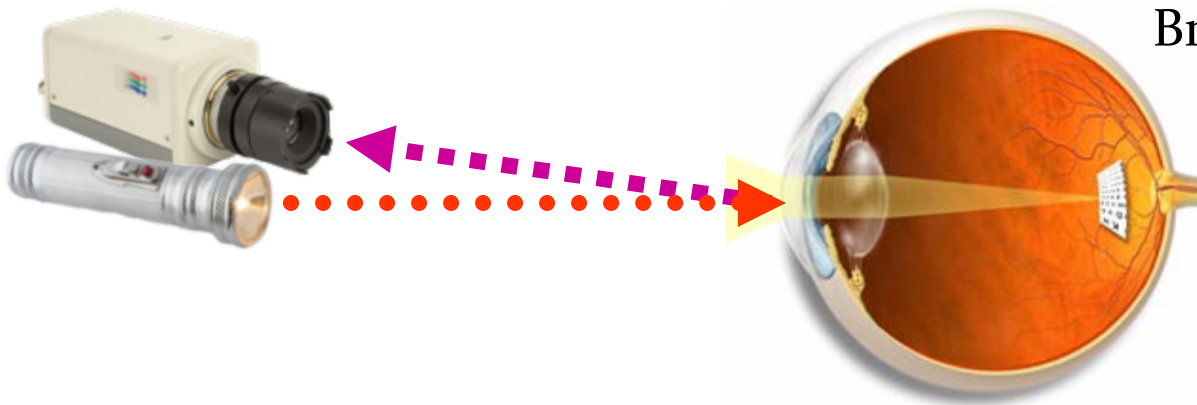
# Dark Pupil Effect



# Bright Pupil Effect

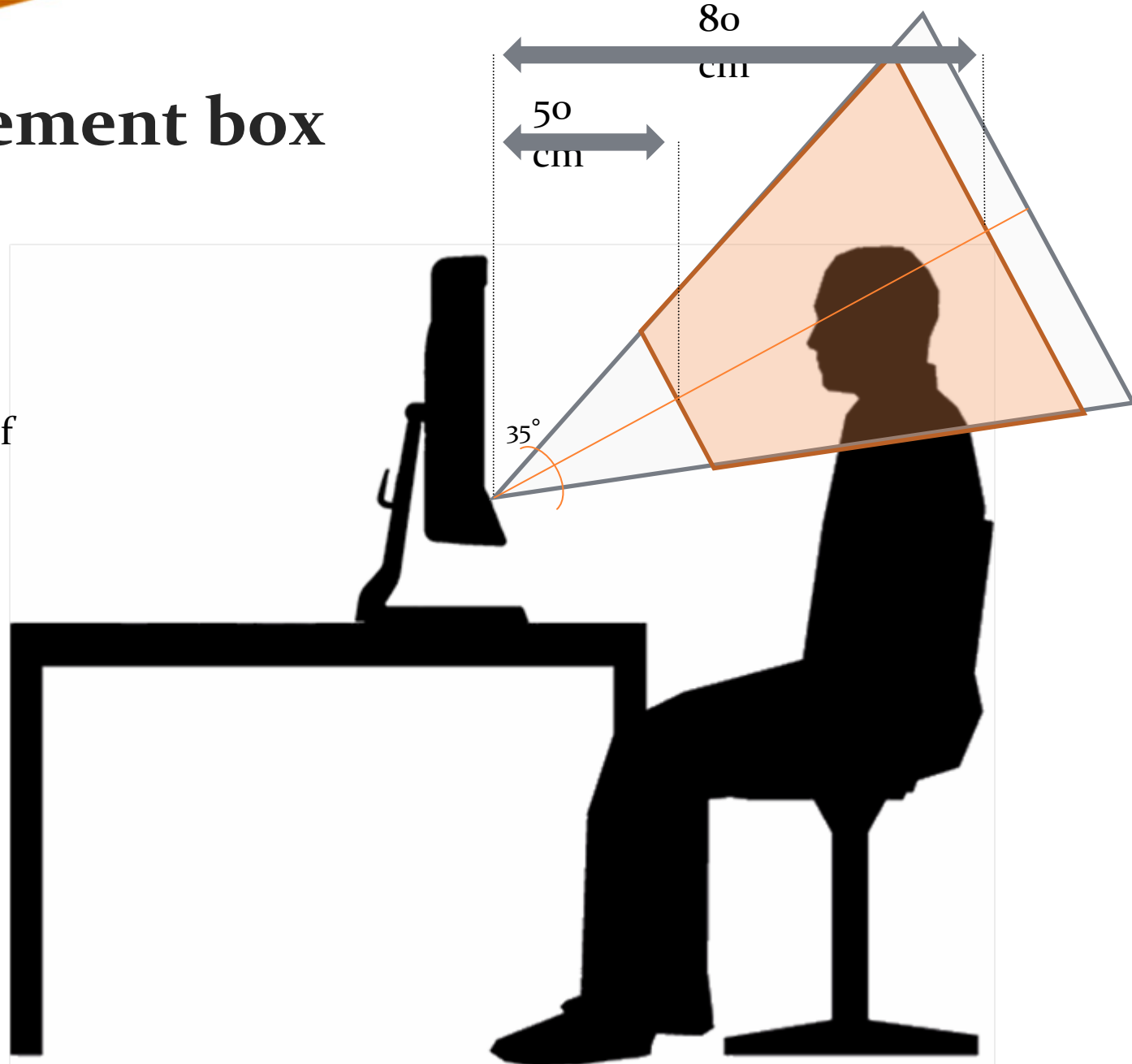


On-axis



# Head movement box

-  Head movement range
-  Camera field of view



# Who is Tobii Technology?

- World leader in eye tracking
- Established in 2001
- Headquarters in Sweden. Offices in Norway, Germany, USA and Japan
- 300 people
- Numerous technology and innovation awards

# Tobii Technology



Scientific Research

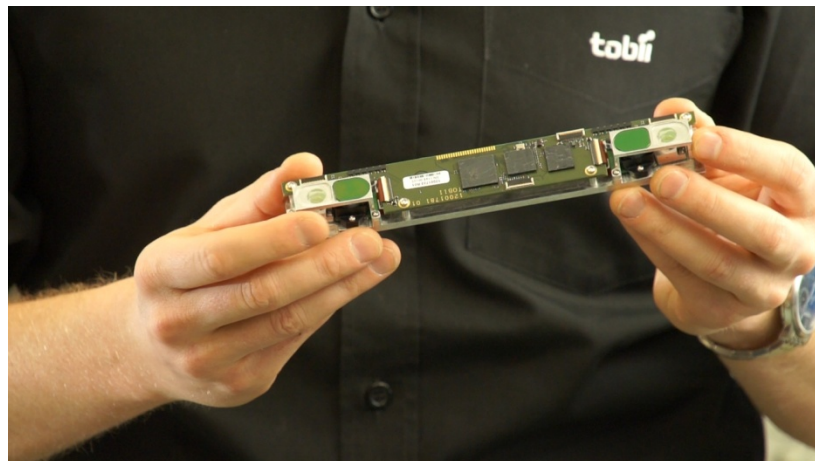


Commercial Research

# Tobii Technology



Assistive  
Technology



Custom solutions

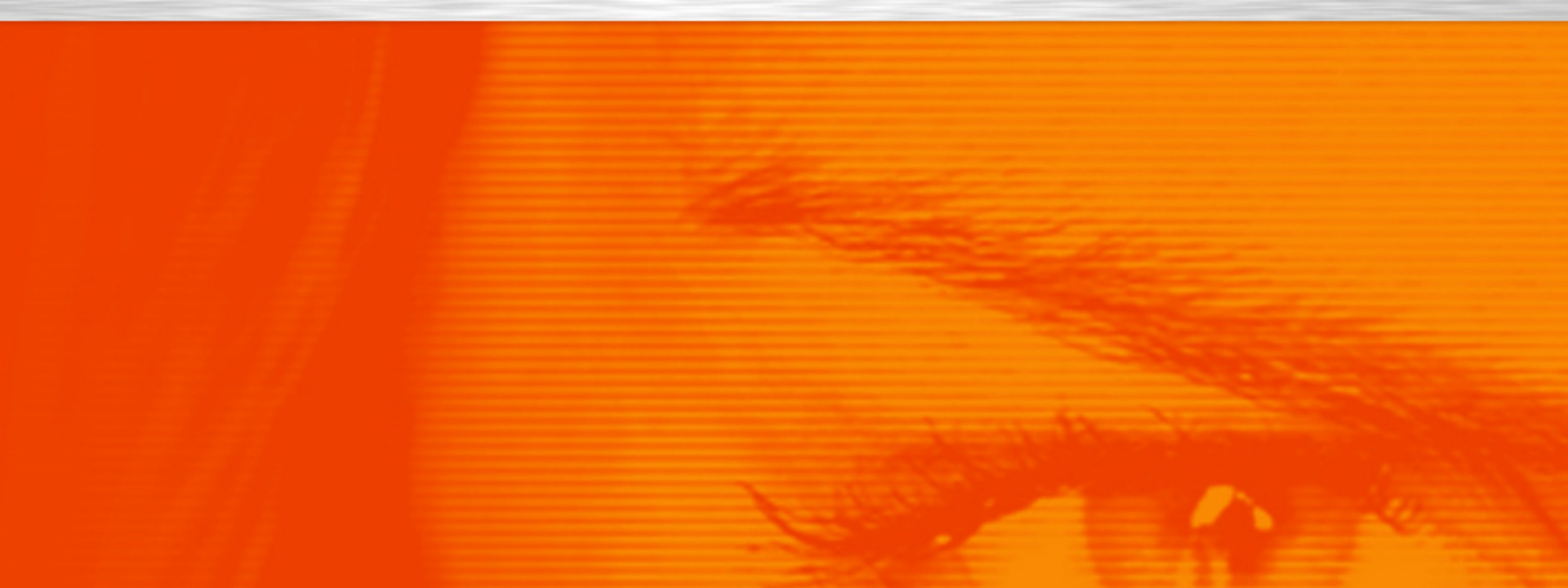
# Effects on Your Business

## TODAY

- E-Commerce sites are using eye tracking as part of usability testing the site
- In-Store testing can identify how people shop and try on glasses to improve findability

## TOMORROW

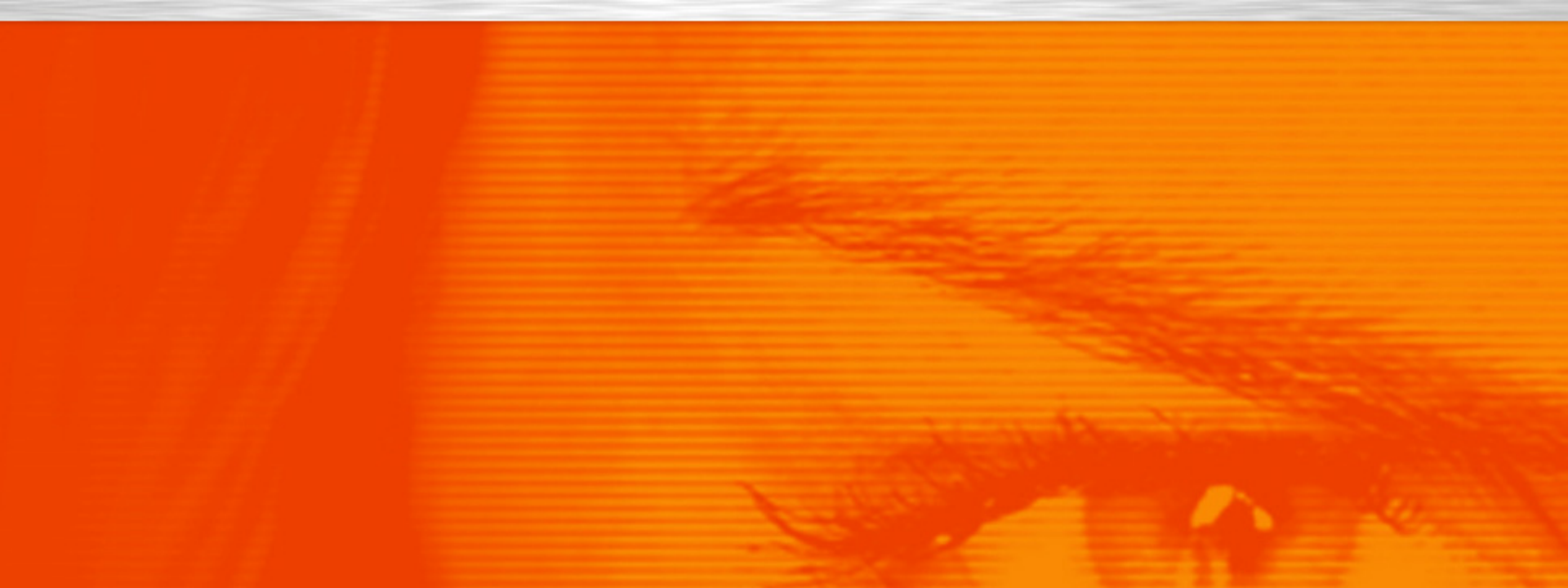
- Glasses will be designed using gaze interaction technology in CAD software – end of this year
- Gaming, kiosks, lie detection, financial services – end of this year
- driving, computer use, home automation, home health, disease diagnosis, lie detection, control rooms....



# SCIENTIFIC RESEARCH

# A sample of Scientific Research

- Gaze tracking to modify teaching techniques and images in teaching science
- Primate studies to assess facial looking patterns in primates
- Looking patterns in toddlers for early detection of autism, ADD
- Reading studies
- Traumatic Brain Injury research
- Cognitive load in stress environments



Next up!

# **EYE TRACKING IN USABILITY (WEBSITES)**

# Examples of real questions

- Do customers process the web page in the order we think they do/should/will?
- What do they read and ignore on our web page?
- Where do they pause? Is this because they are confused about where to click?
- What version engages people more?
- Does the new nav bar speed info finding?
- What works well? What doesn't work?
- Is there a shape or pattern to a website that works better than others?

# Did you notice the *Used Textbooks* sale offer?

The screenshot shows the Amazon.com homepage. At the top, the navigation bar includes the Amazon logo, a search bar, and links for 'Hello, Sign in', 'Your Amazon.com', 'Today's Deals', 'Gifts & Wish Lists', and 'Gift Cards'. A green circle highlights a promotional banner for 'Up to 90% off used textbooks' with a 'Shop now' link. Below this, there's a large advertisement for 'The Orange Savings Account' by ING DIRECT, featuring the text 'High Interest. No Fees. No Minimums.' and 'Save your money'. Further down, there's a section titled 'What Other Customers Are Looking At Right Now' with four product recommendations: 'Lucien's Gamble' by Sylvia Day (Kindle Edition, \$0.00), 'Listen' by Rene Gutteridge (Kindle Edition, \$0.00), 'Love, Unexpectedly' by Susan Fox (Kindle Edition, \$0.00), and 'Kindle Wireless Reading Device, Wi-Fi...' (Amazon, \$139.00). Below this is a section titled 'Hot Watch Brands, Cool Everyday Prices' with three watch recommendations: 'Save Up to 40%...', 'Luxury Watch', and 'Sports Watch'. At the bottom right, there's another advertisement for 'LEADERSHIP, MANAGEMENT, NEGOTIATION and more.'.

**“No, I did not.”**

## And that's where the capability of traditional UX methodology ends.

- But what does “*failure to recall*” actually tell us about UX problems in this task?
- Did they not see it?
- Did they see it but just not process it?
- You can't recommend the *appropriate* design remedy unless you disambiguate the causes.

# Eye tracking takes you further

*“There's a difference between "seeing" something and ignoring it, and not seeing it at all, and traditional usability testing cannot make that distinction.”*

Ian Everdell, Manager, User Experience & Research, Mediative

# Didn't see it at all

amazon.com Hello. Sign in to get personalized recommendations. New customer? Start here. Your Amazon.com Today's Deals Gifts & Wish Lists Gift Cards Account Help

Shop All Departments Search All Departments

Books > Movies, Music & Games > Digital Downloads > Kindle > Computers & Office > Electronics > Home, Garden & Pets > Grocery, Health & Beauty > Toys, Kids & Baby > Clothing, Shoes & Jewelry > Sports & Outdoors > Tools & Home Improvement > Automotive & Industrial >

Treat Yourself to Kindle The #1 Bestseller on Amazon

Order now: \$139 Wi-Fi | \$189 Free 3G-Wi-Fi

What Other Customers Are Looking At Right Now

Lucien's Gamble... Sylvia Day Kindle Edition \$0.00

Listen Rene Gutteridge \$0.00

Unex... Susan Fox Kindle Edition \$0.00

Kindle Wireless Reading Device, Wi-Fi... Amazon \$139.00

Hot Watch Brands, Cool Everyday Prices

Save Up to 40%

Luxury Watches

Sports Watches

25% Off Select Valentine's Day Gifts

Up to 90% off used textbooks

The Orange Savings Account™ High Interest. No Fees. No Minimums.

TurboTax Guides You Step by Step to Your Biggest Refund

Earn Triple Points on Amazon.com Orders. Start with \$30 back.

LEADERSHIP, MANAGEMENT, NEGOTIATION and more.

# Saw it but couldn't recall it

amazon.com Hello. Sign in to get personalized recommendations. New customer? Start here.

Your Amazon.com Today's Deals Gifts & Wish Lists Gift Cards Account Help

Shop All Departments

Books

Movies, Music & Games

Digital Downloads

Kindle

Computers & Office

Electronics

Home, Garden & Pets

Grocery, Health & Beauty

Toys, Kids & Baby

Clothing, Shoes & Jewelry

Sports & Outdoors

Tools & Home Improvement

Automotive & Industrial

Treat Yourself to a Kindle

The #1 Bestseller on Amazon

Order now: \$139 Wi-Fi | \$189 Free 3G+Wi-Fi

25% Off Select Valentine's Day Gifts

Up to 90% off textbooks

ING DIRECT

High Interest. No Fees. No Minimums.

TurboTax

Guides You Step by Step to Your Biggest Refund

amazon.com

Earn Triple Points on Amazon.com Orders. Start with \$30 back.

LEADERSHIP, MANAGEMENT, NEGOTIATION and more.

Hot Watch Brands, Cool Everyday Prices

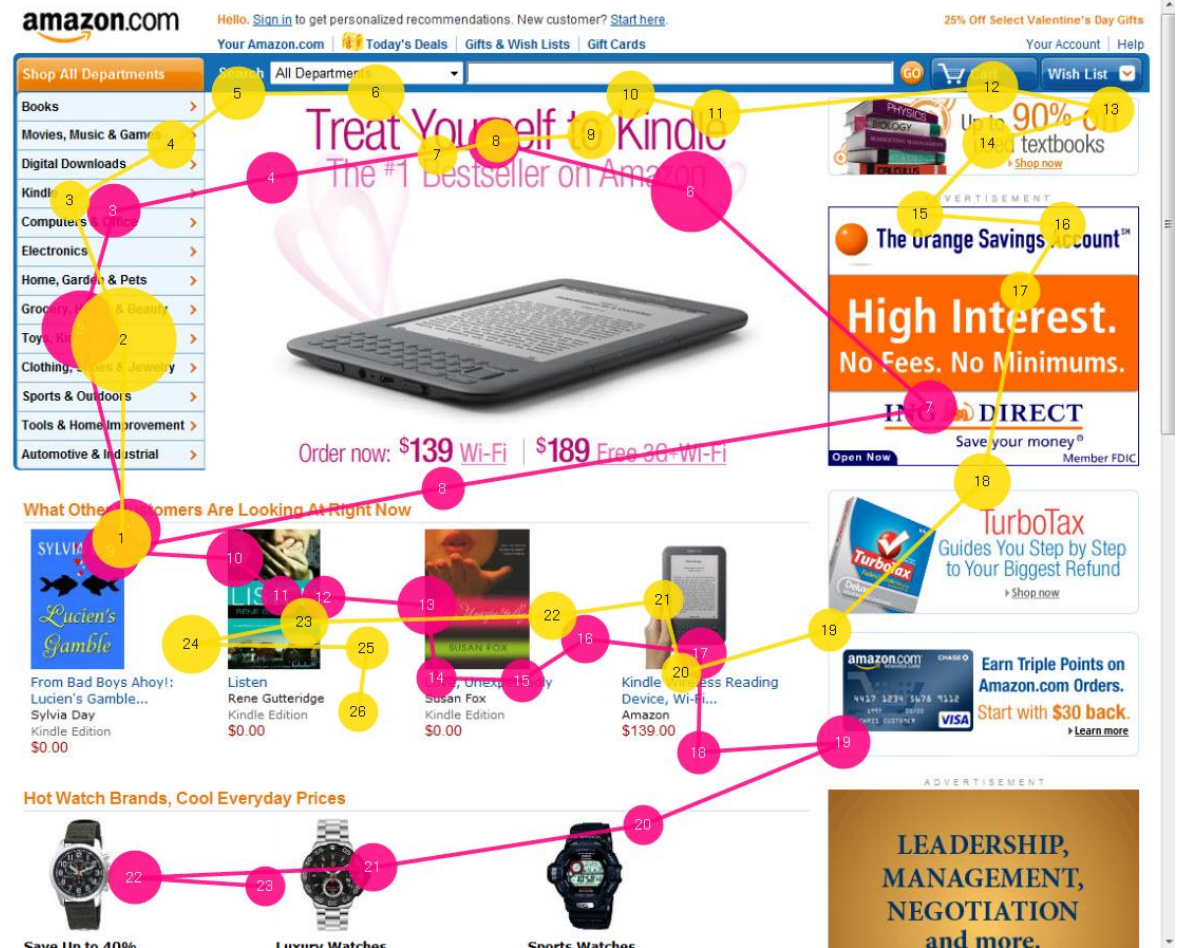
Save Up to 40%

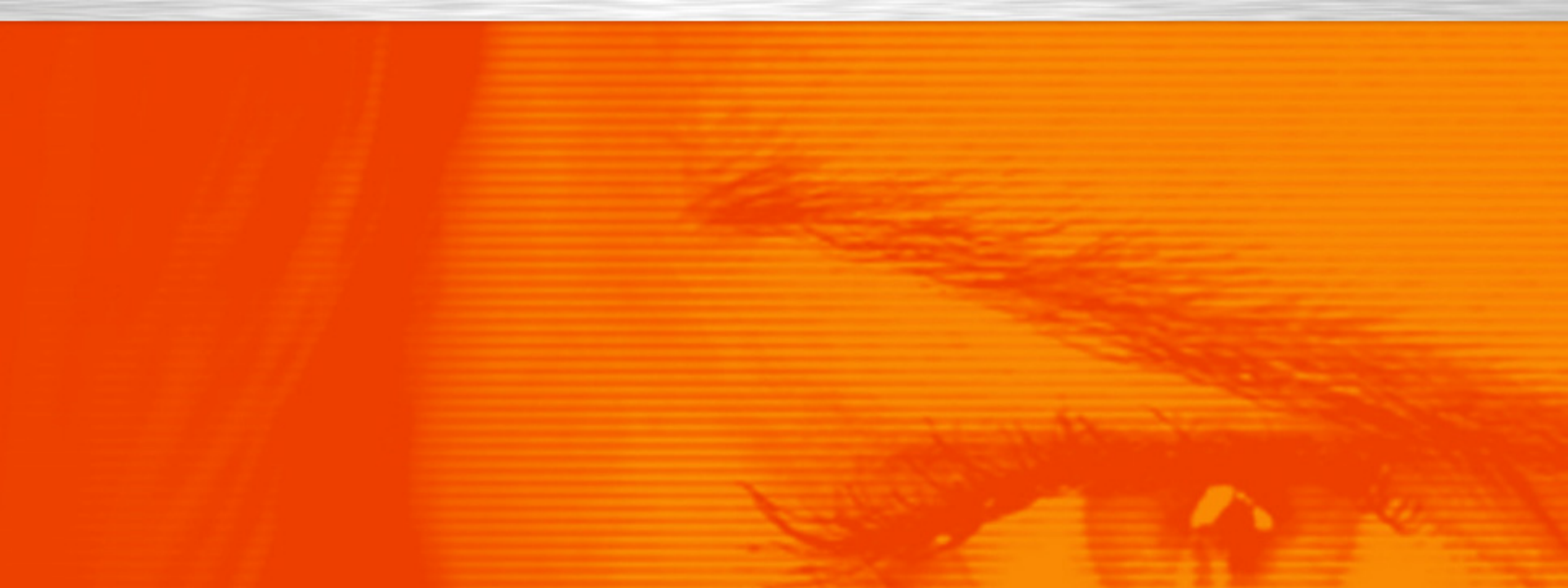
Luxury Watches

Sports Watches

# Eye tracking reveals 2 distinct solutions

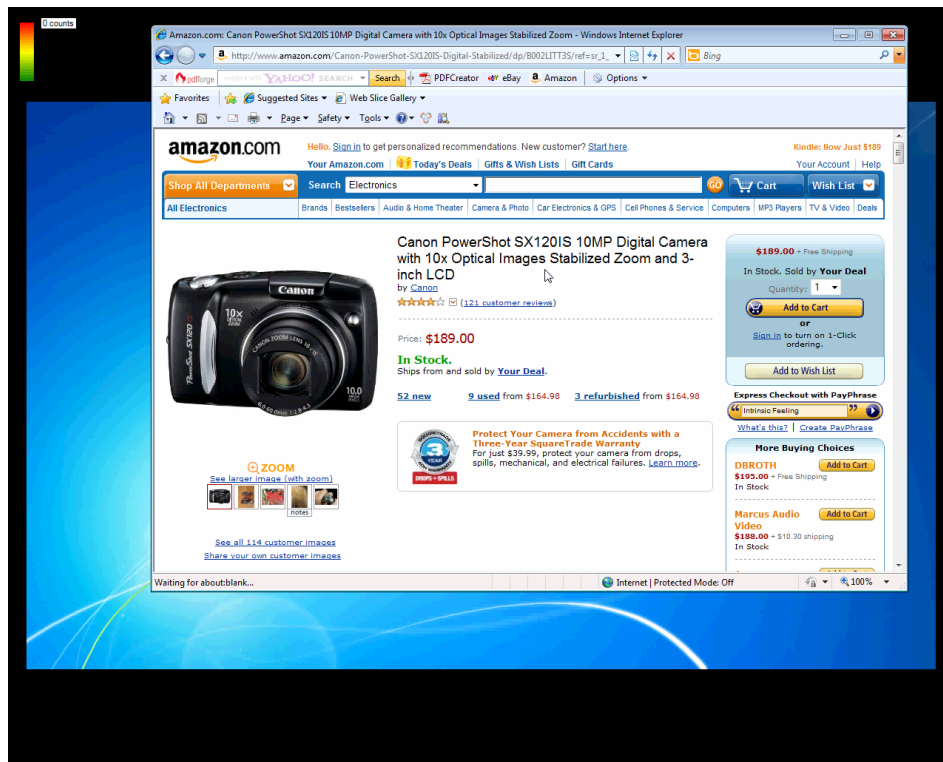
- Did not see
  - ✓ Structural change to redirect overall visual flow
  - ✓ Redesign layout to counteract “banner blindness”
- Saw/ignored
  - Increase visual salience of element (size, contrast, motion, color)



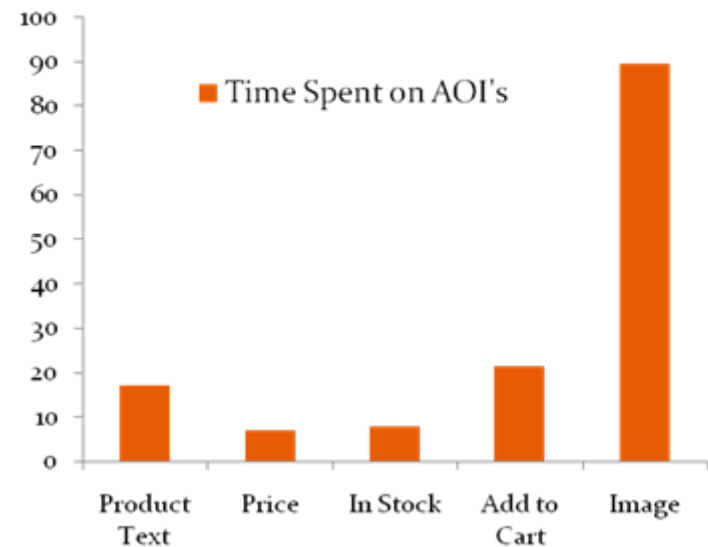
A close-up photograph of a human eye, looking slightly to the right. The image is heavily overlaid with a semi-transparent orange color, which is darker around the eye and lighter towards the edges. The eye's iris and pupil are visible through the overlay.

# Eye Tracking Teaching Cases

# Insights gained – Laptop/desktop computer



## Total Fixation Duration on Areas of Interest





# Insights gained – In-store environment



| Time to First Fixation |              |                   |                  |
|------------------------|--------------|-------------------|------------------|
| All Media              |              |                   |                  |
| All AOIs               |              |                   |                  |
| Participant Groups     | N<br>(Count) | Mean<br>(Seconds) | Sum<br>(Seconds) |
| Browsing               | 6            | 2.88              | 17.31            |
| Actively Seeking       | 5            | 2.00              | 9.99             |
| All Participants       | 11           | 2.48              | 27.30            |

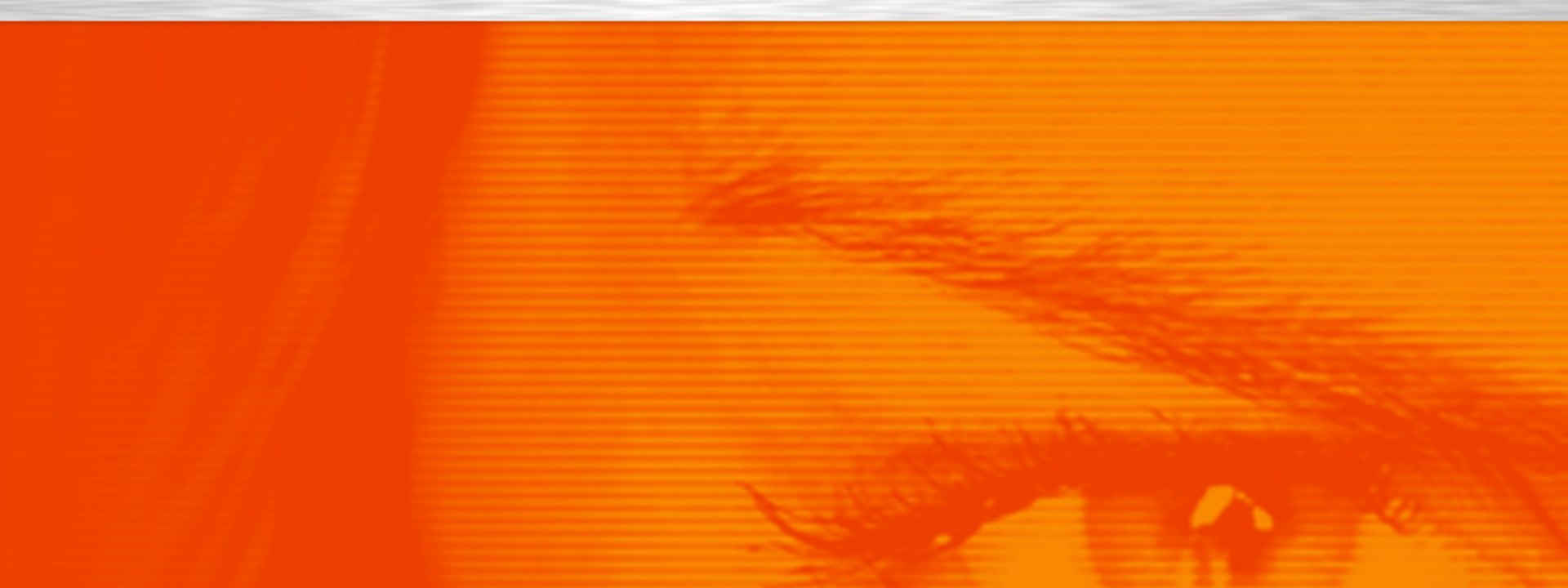
TFF to price tag after locating device



# Insights gained – Mobile devices







Next up!

# **EYE TRACKING IN MARKET RESEARCH**

# Our eyes reveals when we are thinking and reading



Extra gentle for the most sensitive skin.

So gentle for ultra sensitive skin, add the chemicals and moisture of urine and stools, and you have diaper rash.

Baby Wiper's unique high-absorbency natural-blend cotton padding provides cotton-soft, extra thick, gel-free protection for your baby's sensitive skin. The chlorine-free materials and absorbent polymers is non-toxic and non-irritating. Clinically tested and pediatrician recommended for babies with allergies and sensitive skin.



by™

If you are not satisfied with the baby leakage protection, you will get your money back. Read more about our leakfree guarantee at [www.baby.com](http://www.baby.com)

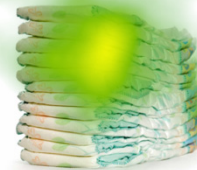
Fixation length



Extra gentle for the most sensitive skin.

So gentle for ultra sensitive skin, add the chemicals and moisture of urine and stools, and you have diaper rash.

Baby Wiper's unique high-absorbency natural-blend cotton padding provides cotton-soft, extra thick, gel-free protection for your baby's sensitive skin. The chlorine-free materials and absorbent polymers is non-toxic and non-irritating. Clinically tested and pediatrician recommended for babies with allergies and sensitive skin.



by™

If you are not satisfied with the baby leakage protection, you will get your money back. Read more about our leakfree guarantee at [www.baby.com](http://www.baby.com)

Fixation count

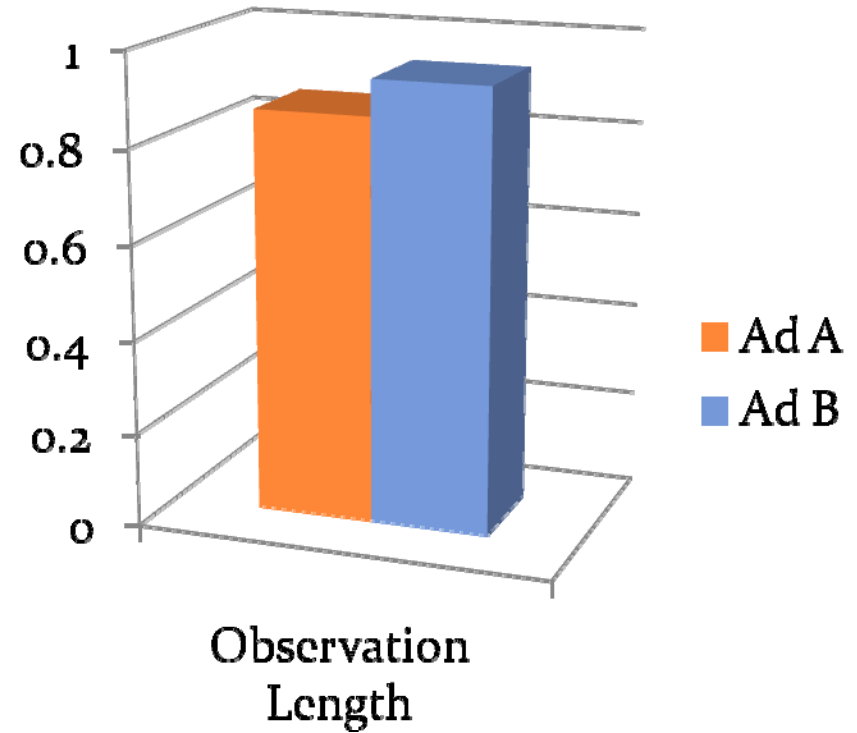
# Reveals The Impact of The Design



A



B



# Integrated systems – T-Series

- ✓ Fully self-contained testing station
- ✓ Familiar, natural usage
- ✓ Fast & easy setup/takedown
- ✓ Easy to transport
- ✓ **Web, documents, apps, simulations**





# Mobile Device Testing

# Portable systems – X1-Light

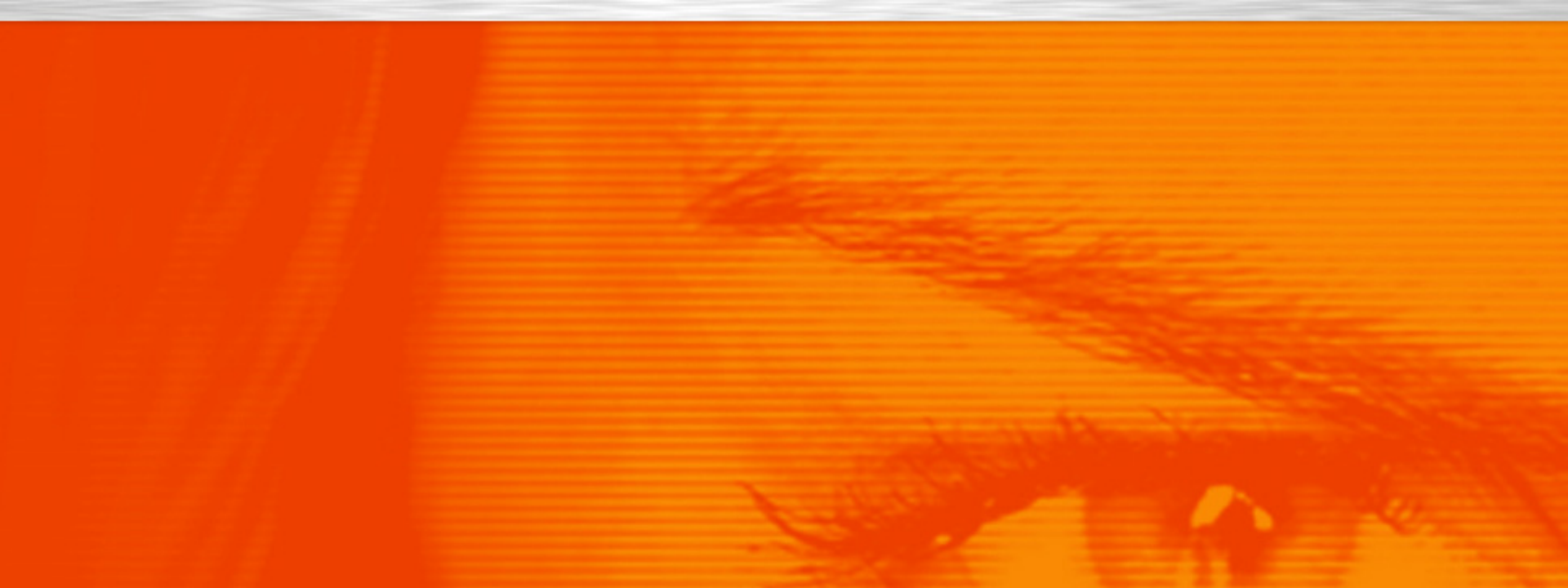
- ✓ Eye tracker + mounting frames
- ✓ Flexible configurations
- ✓ *Easy* setup process
- ✓ **In the field on laptops, ATMs, kiosks**



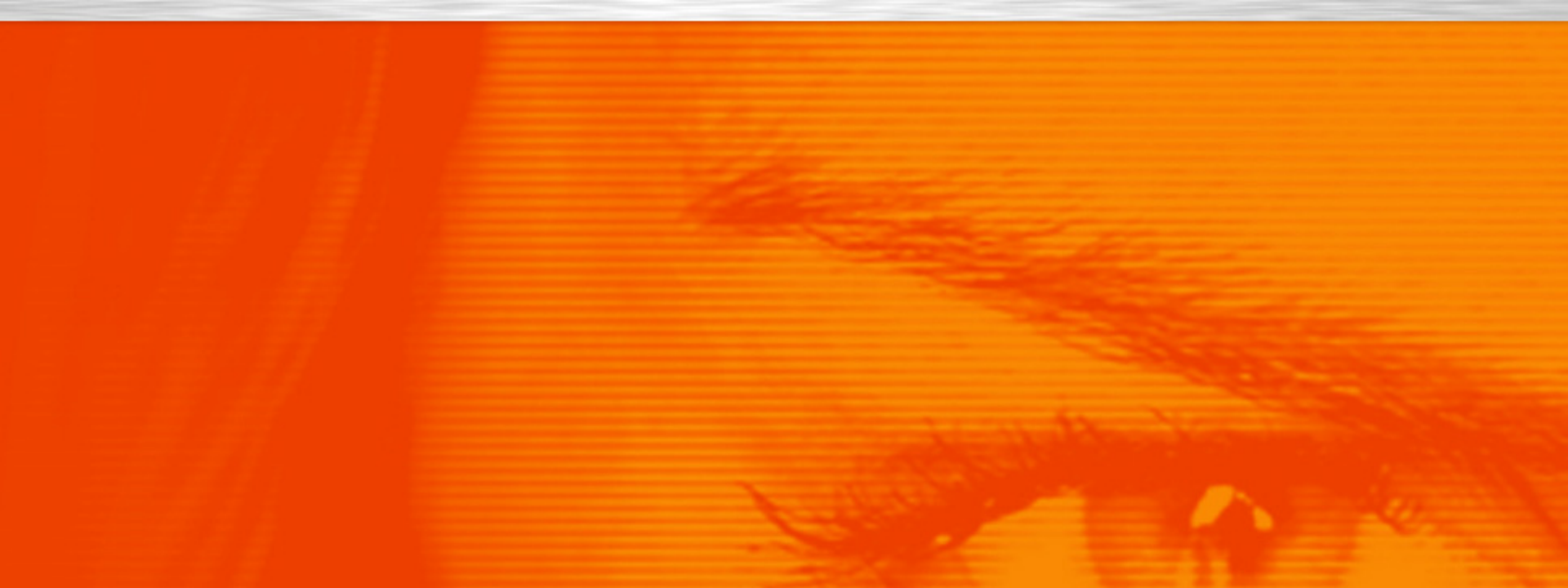
# Head-mounted - Glasses

- ✓ Eye tracker *embedded in glasses*
- ✓ Quick setup and use
- ✓ Free roam *any* environment
- ✓ **In-store and more, sky's the limit!**



The top half of the slide features a solid orange background. On the right side, there is a faint, close-up image of a human eye, looking slightly to the right. The eye's iris and eyelashes are visible, though the image is semi-transparent and blends into the orange background.

# **MARKET APPLICATIONS FOR EYE CONTROL**



# GAZE INTERACTION



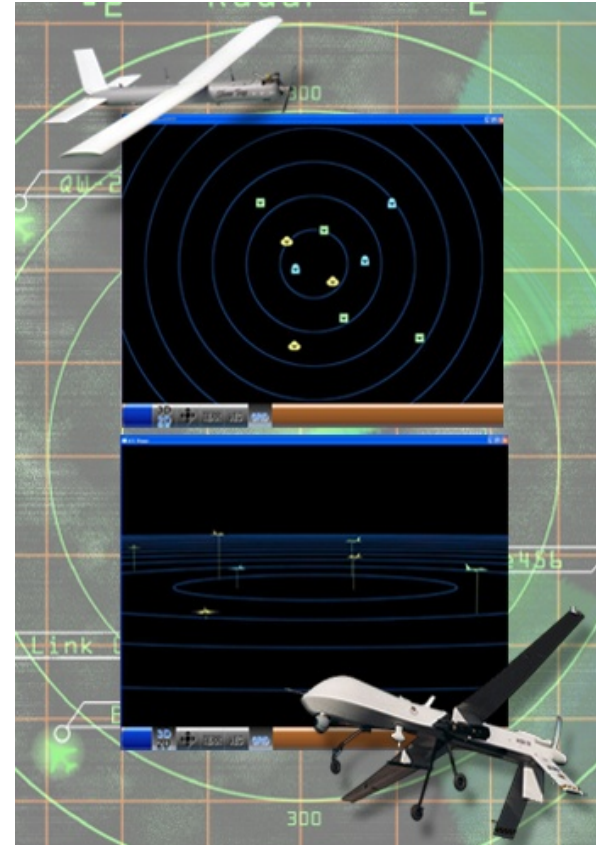
# Embedded Eye Trackers and Eye Control: Surgery



# Eye Control: Control Rooms

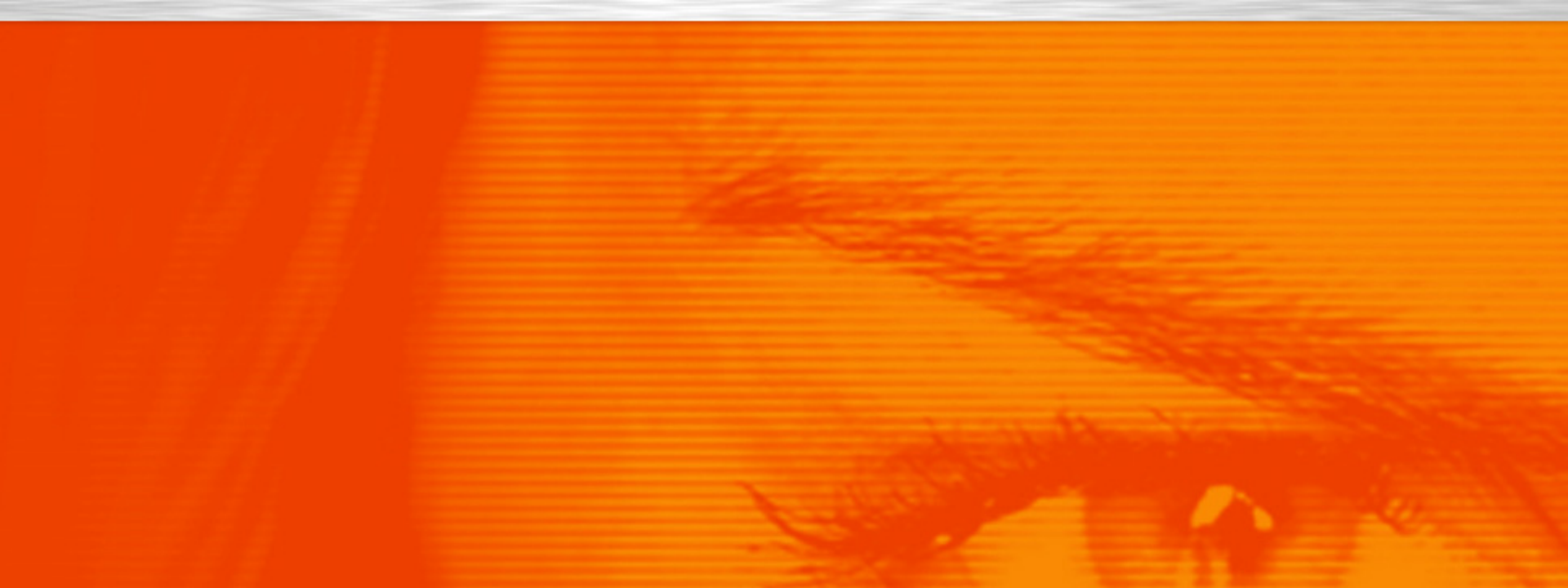


# Eye Control: Control Rooms



# Eye Control: Arcade Gaming



A close-up photograph of a human eye, looking slightly to the right. The image is heavily overlaid with a semi-transparent orange color, which is darker on the left and fades towards the right. The eye's iris and eyelashes are visible through the overlay.

# **GAZE INTERACTION AND NATURAL USER INTERFACES**

# Natural User Interfaces

## Handheld devices

### Touch



## Laptops and desktops

### Eye Control



## TV:s and consoles

### Gestures



*While hands are a great input device, **eye control** is the ideal complementary natural user interface*

Close

Far  
away

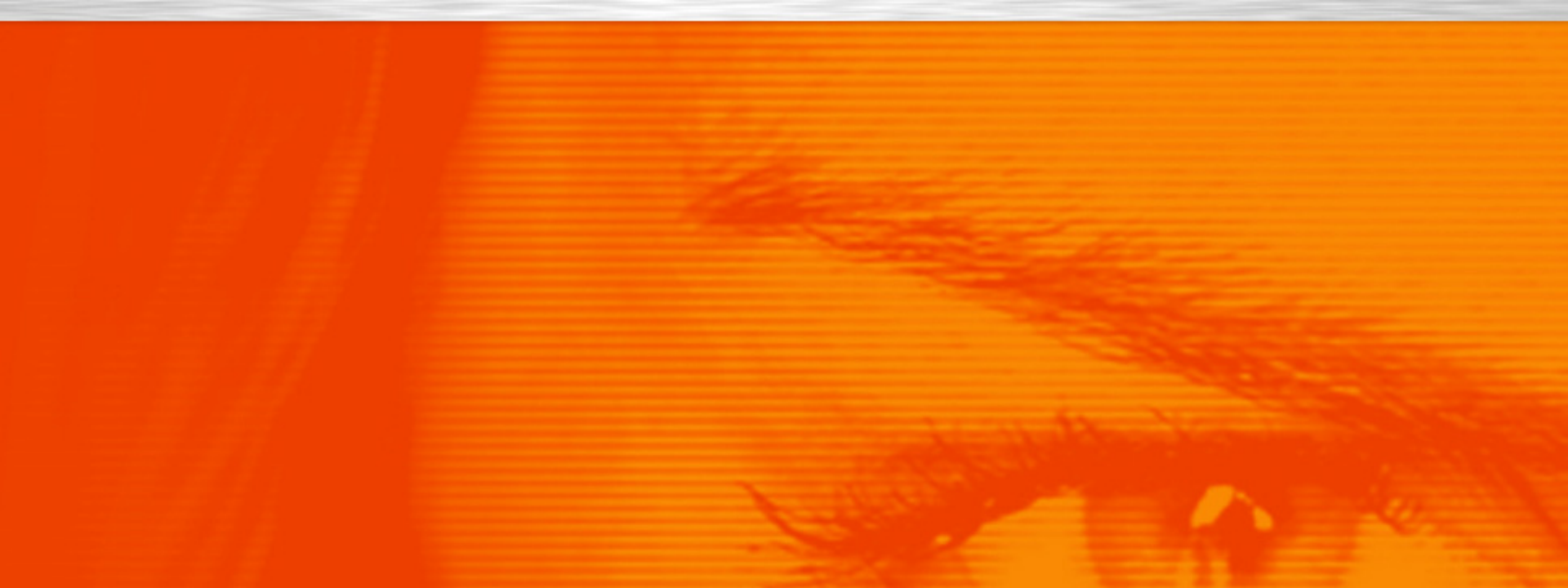
# How Will the Technology Affect Your Business

## TODAY

- E-Commerce sites not using eye tracking as part of usability testing the site –are losing customers
- In-Market testing can identify how people shop to improve findability

## TOMORROW

- Glasses will be designed using gaze interaction technology in CAD software
- Gaming, driving, computer use, home automation, home health, disease diagnosis, lie detection, control rooms....



**THANK YOU!**  
**BARBARA.BARCLAY@TOBII.COM**