

Human Computer Interaction CS449 – CS549

Week 6-1

Psychology of HCI - cont

KÜRŞAT ÇAĞILTAY

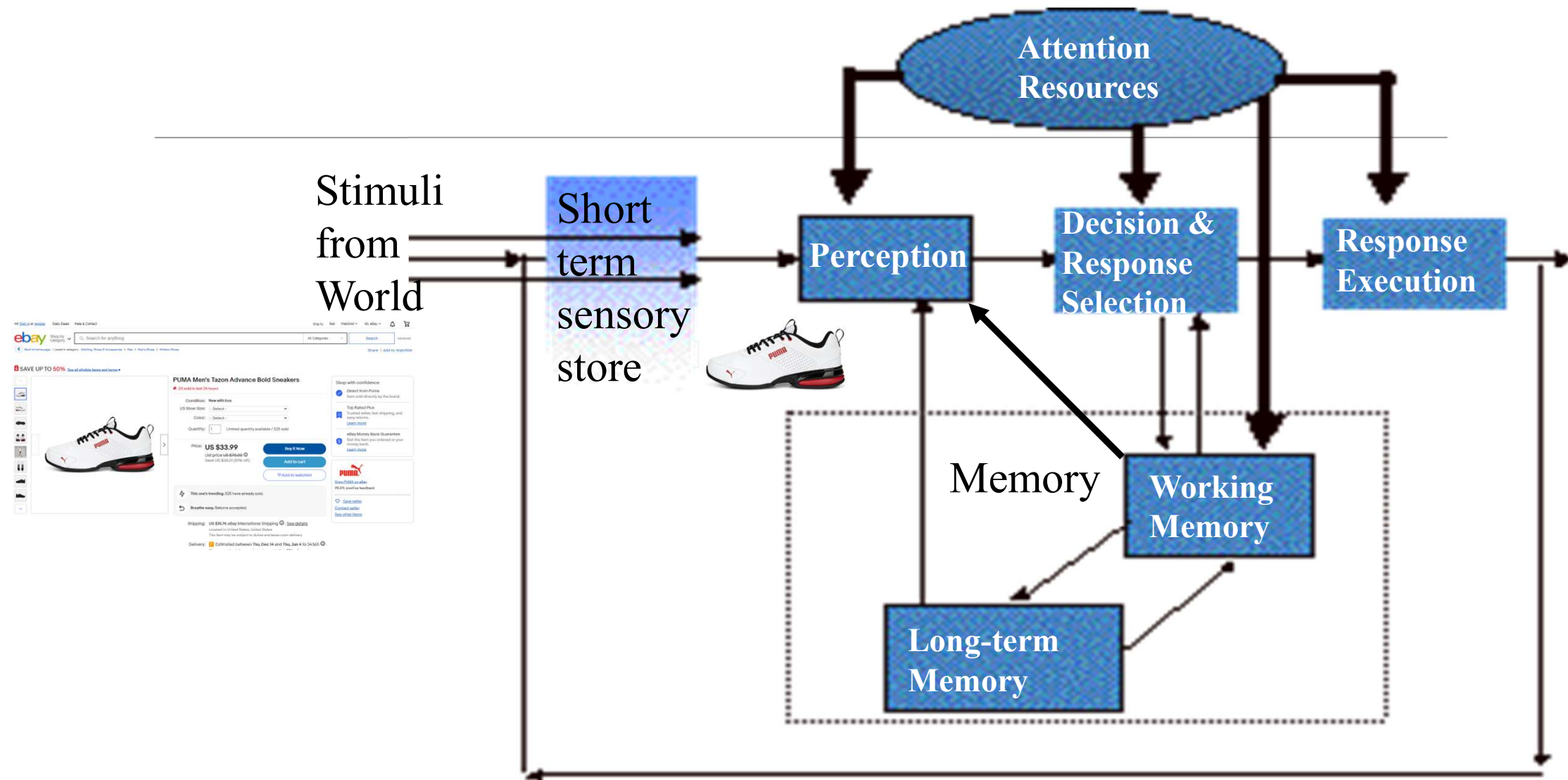
Today

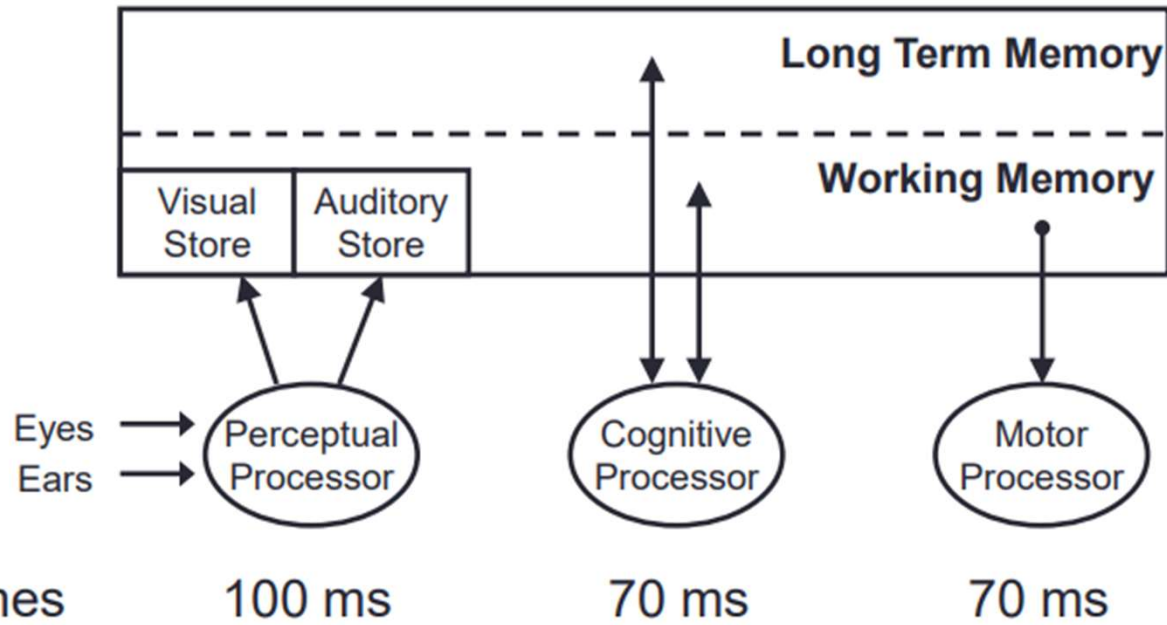
- Continue with Intro to Psychology of HCI
- Experiments
- New Assignment

No class on November 10th

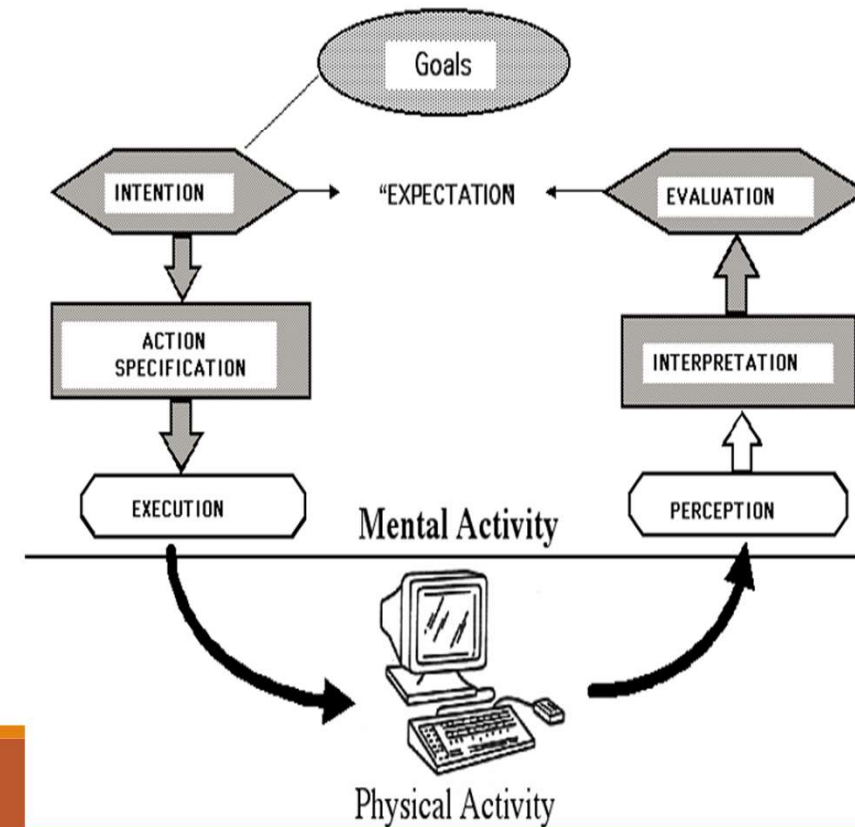
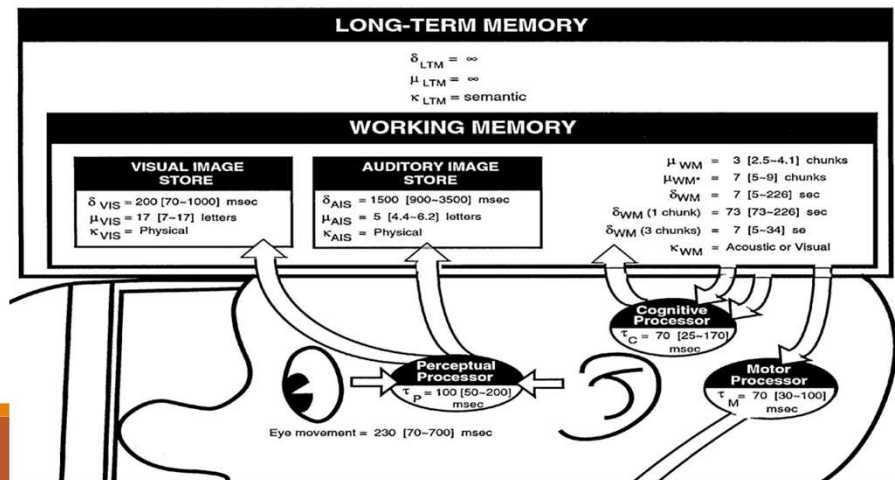
- Ceremony for Atatürk will be held at 8:45 AM
- Sabancı University Performing Arts Center (SGM)
- Please attend

Wickens (1992)





Perceive-Recognize-Act cycle ≈ 240 ms



LONG-TERM MEMORY

$$\delta_{LTM} = \infty$$

$$\mu_{LTM} = \infty$$

$$\kappa_{LTM} = \text{semantic}$$

WORKING MEMORY

VISUAL IMAGE STORE

$\delta_{VIS} = 200$ [70~1000] msec
 $\mu_{VIS} = 17$ [7~17] letters
 $\kappa_{VIS} = \text{Physical}$

AUDITORY IMAGE STORE

$\delta_{AIS} = 1500$ [900~3500] msec
 $\mu_{AIS} = 5$ [4.4~6.2] letters
 $\kappa_{AIS} = \text{Physical}$

$\mu_{WM} = 3$ [2.5~4.1] chunks

$\mu_{WM^*} = 7$ [5~9] chunks

$\delta_{WM} = 7$ [5~226] sec

$\delta_{WM} (1 \text{ chunk}) = 73$ [73~226] sec

$\delta_{WM} (3 \text{ chunks}) = 7$ [5~34] se

$\kappa_{WM} = \text{Acoustic or Visual}$

YES NO
 



Eye movement = 230 [70~700] msec

Perceptual Processor

$\tau_P = 100$ [50~200] msec

Cognitive Processor

$\tau_C = 70$ [25~170] msec

Motor Processor

$\tau_M = 70$ [30~100] msec

Model Human Processor Limitations

- **Processors**
 - Perceptual-100ms
 - Cognitive- 70 ms
 - Motor- 70 ms
- **Visual Image Store**
 - Keeps 200 ms
 - 17 items
- **Auditory Image Store**
 - Keeps 1500ms
 - 5 items
- **Working Memory**
 - Capacity 7+/-2
 - 7 sec

I showed you a number on Friday,
Do you remember it?

Decreasing Working Memory Load



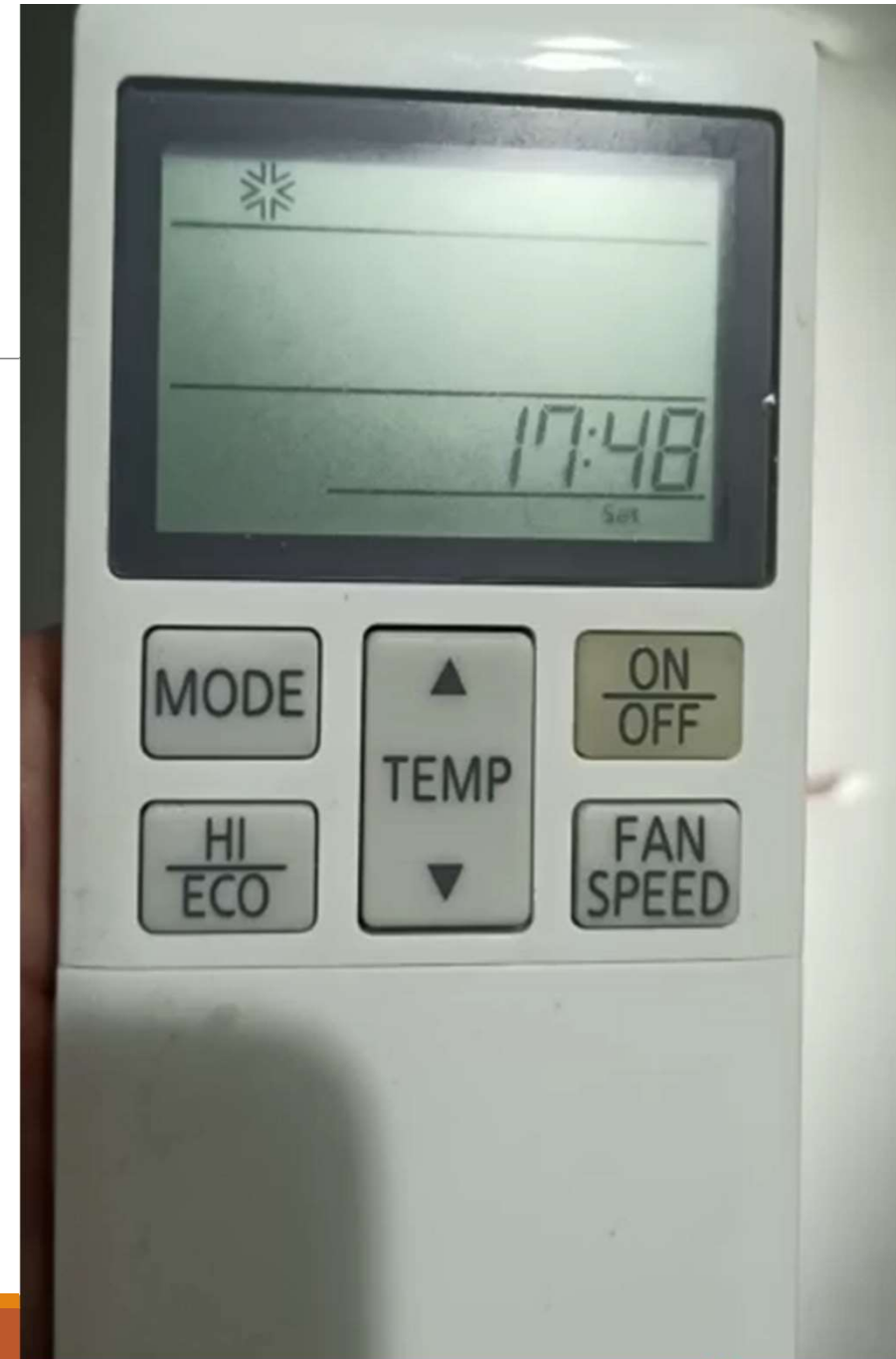
Recall or Recognition

Cognitive Process

Which mode is used in summer?

Decision requires extra Cognitive Processor Efford

Mitsubishi					
Profilo					
Samsung					



Attention?

Hi! [Sign in](#) or [register](#) Daily Deals Help & Contact

Ship to Sell Watchlist My eBay  

 Shop by category  All Categories  Advanced

 [Back to home page](#) | Listed in category: [Clothing, Shoes & Accessories](#) > [Men](#) > [Men's Shoes](#) > [Athletic Shoes](#)

[Share](#) | [Add to Watchlist](#)

 **SAVE UP TO 50%** [See all eligible items and terms](#)

PUMA Men's Tazon Advance Bold Sneakers

 20 sold in last 24 hours

Condition: New with box

US Shoe Size:  - Select -

Color:  - Select -

Quantity: Limited quantity available / 525 sold


Price: **US \$33.99**

List price ~~US \$70.00~~ 
Save US \$36.01 (51% off)


[Buy It Now](#)

[Add to cart](#)

 [Add to watchlist](#)


 This one's trending. 525 have already sold.

 Breathe easy. Returns accepted.


Shipping: **US \$19.74** eBay International Shipping  . [See details](#)


Located in: United States, United States


This item may be subject to duties and taxes upon delivery

Delivery:  Estimated between **Thu, Dec 14** and **Thu, Jan 4** to 34365 

Shop with confidence

 **Direct from Puma**
Item sold directly by the brand.

 **Top Rated Plus**
Trusted seller, fast shipping, and easy returns.
[Learn more](#)

 **eBay Money Back Guarantee**
Get the item you ordered or your money back.
[Learn more](#)



[Shop PUMA on eBay](#)

98.5% positive feedback

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Attention - Multitasking

In the video you will see two groups of people (Black & white tshirts)

Task: Count how many times the players wearing white tshirt pass the ball

Interaction Design-Attention

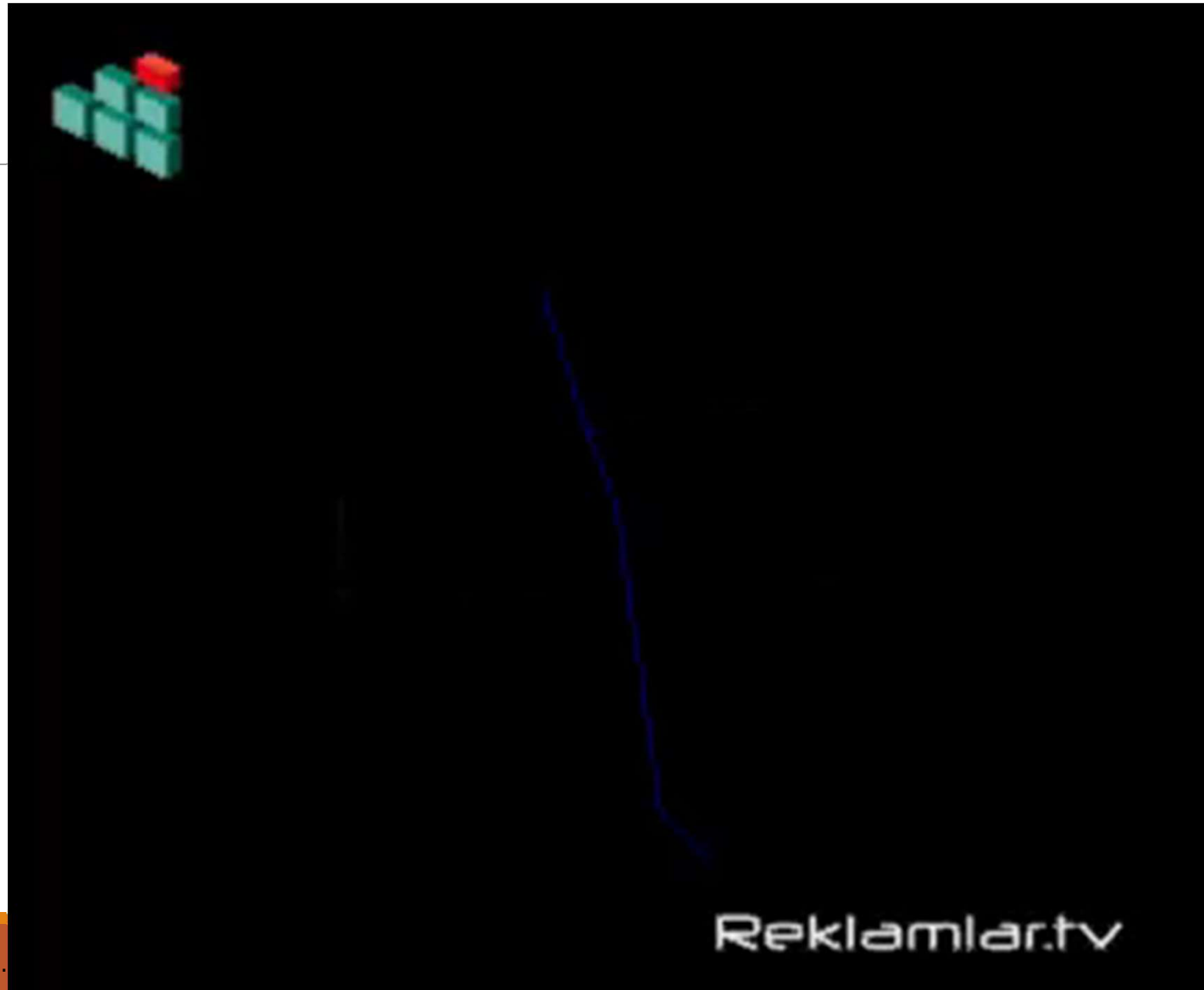
- Are we multitaskers?



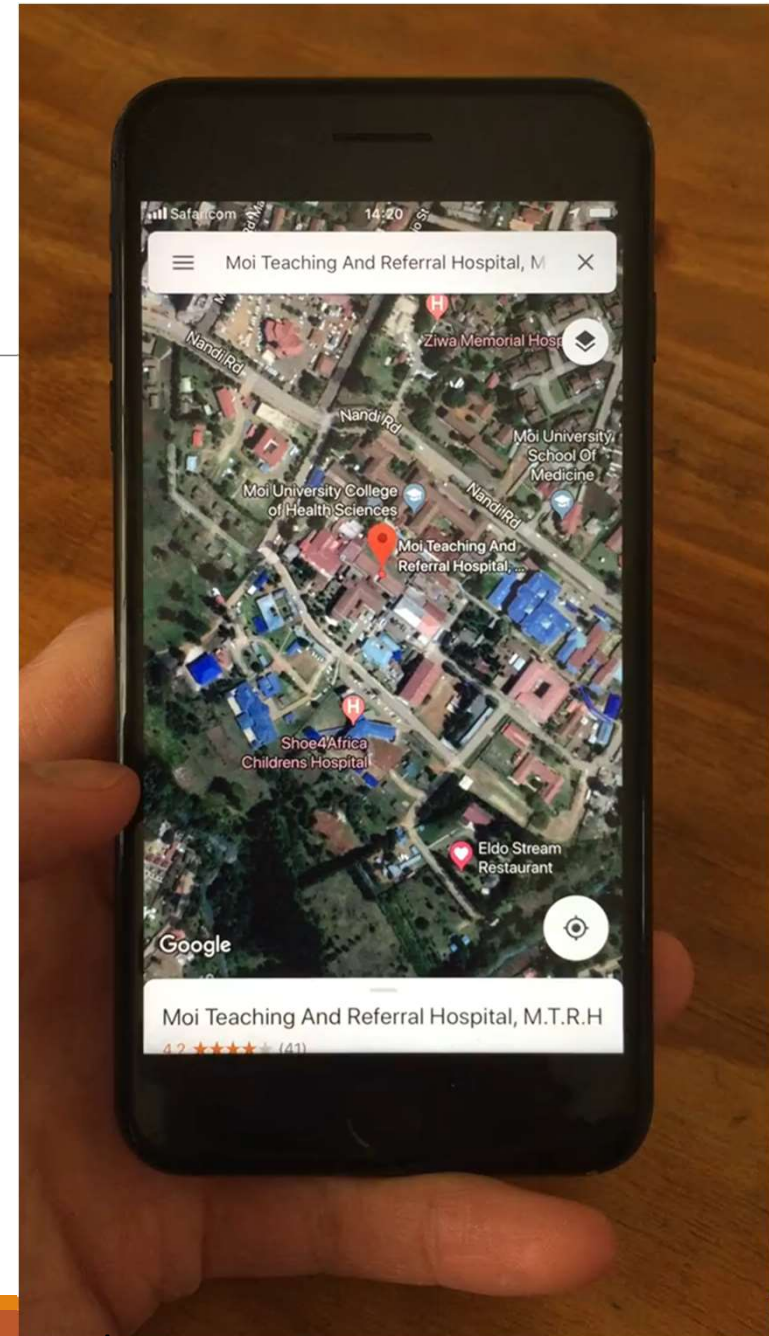
Reklamlar.tv

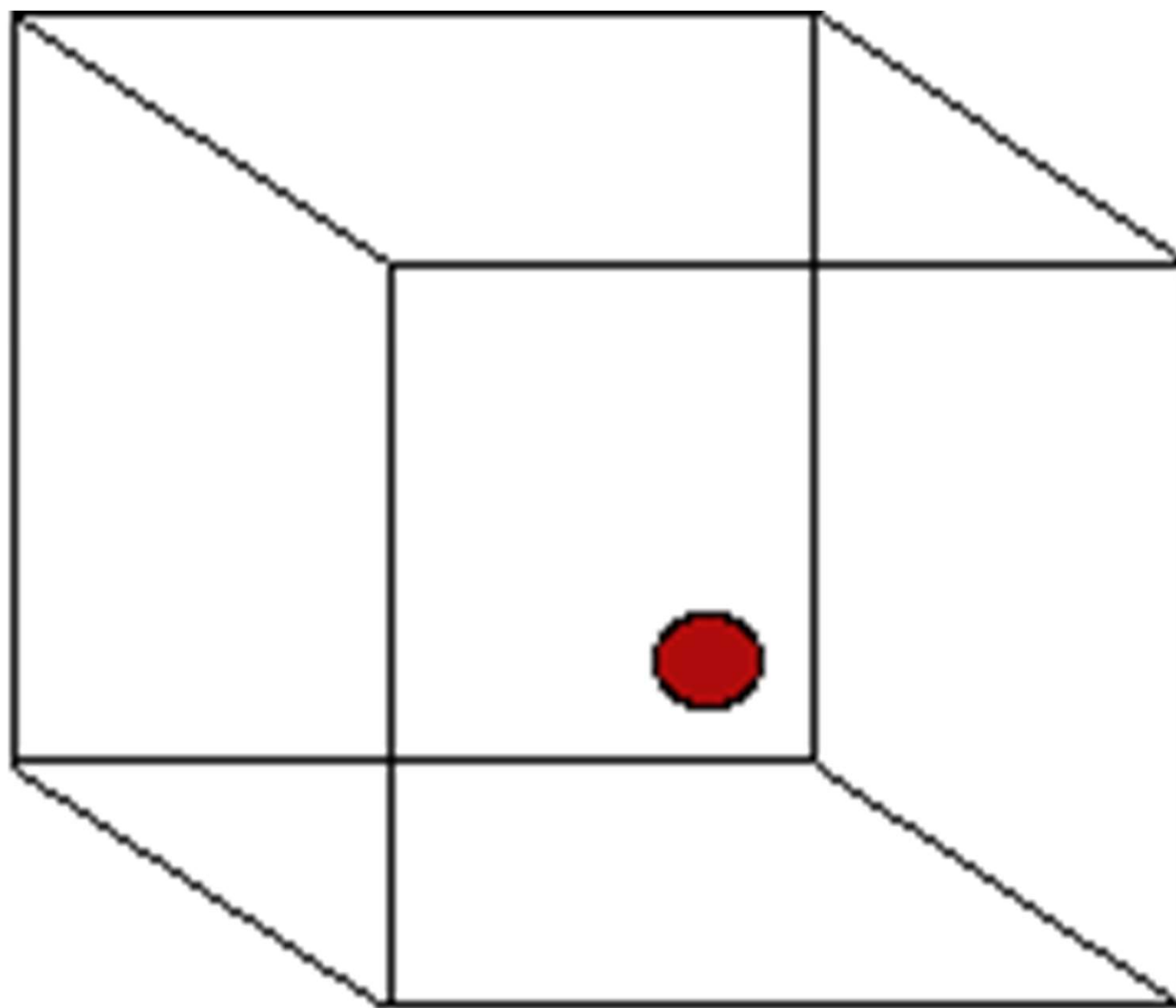
-
- How many degrees can I turn the screen?
 - How many mega pixel?
 - Which sound file format? Wav?
 - Bluetooth? Wifi?

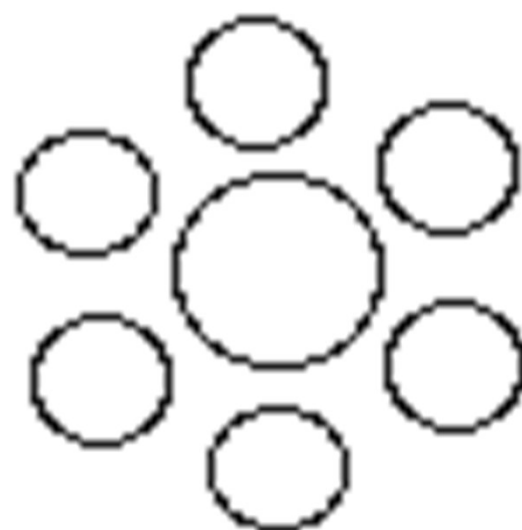
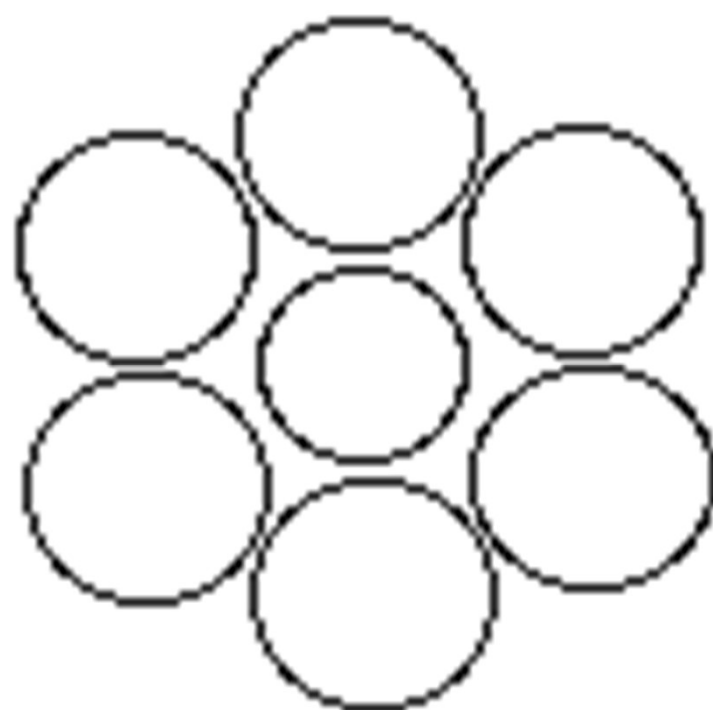
Video with Eye Tracking



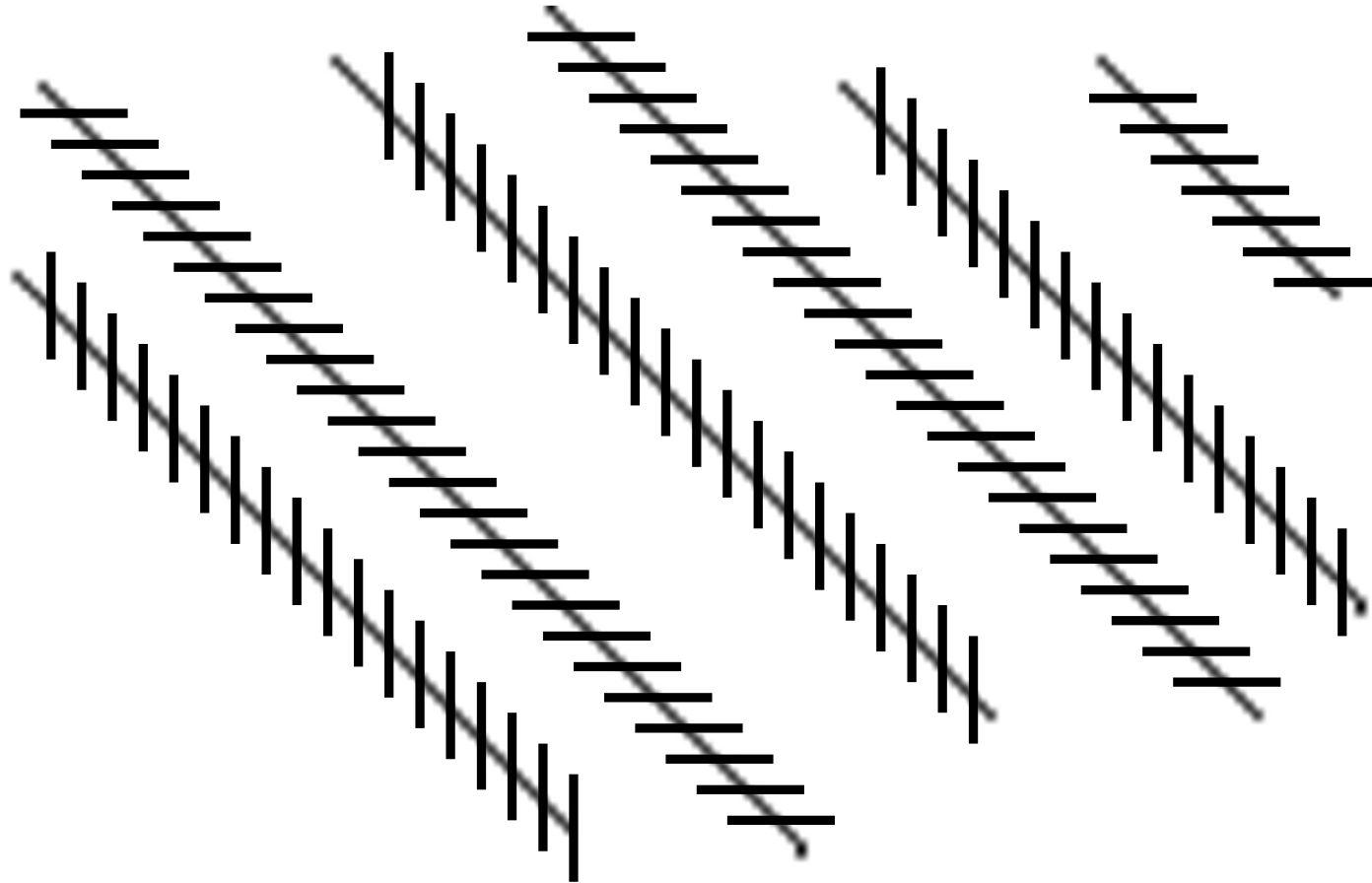
Chunking Example: Multitask Split Screens



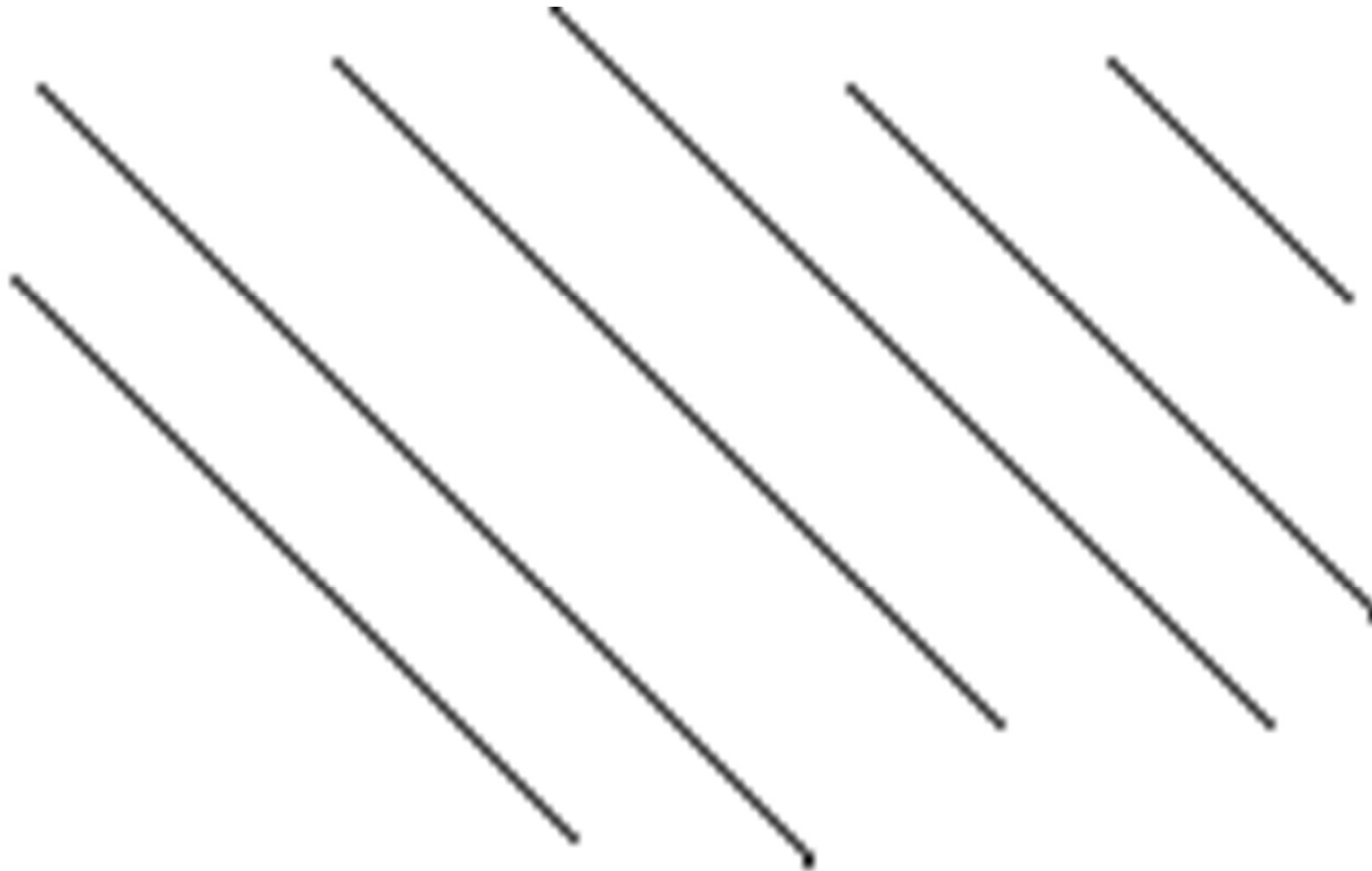




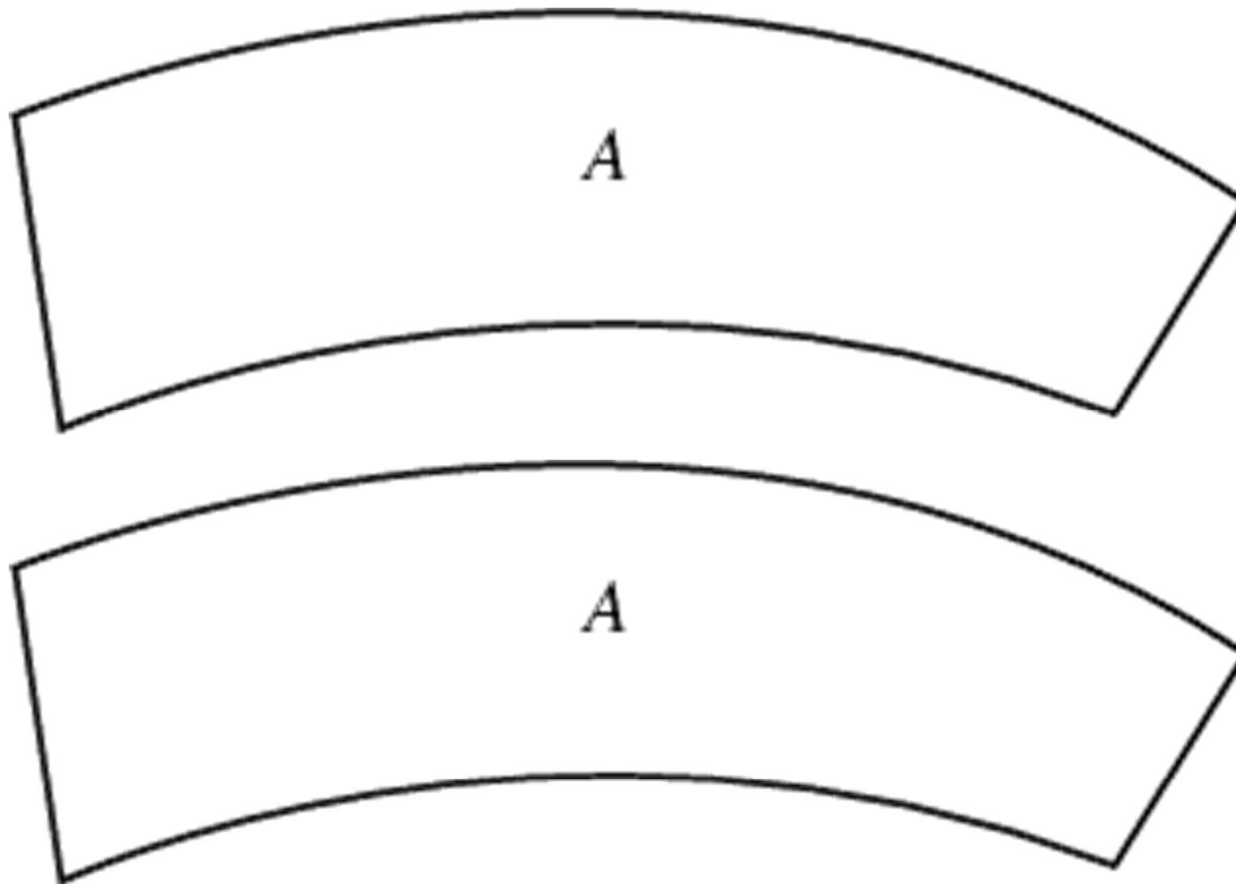
Are long lines parallel?

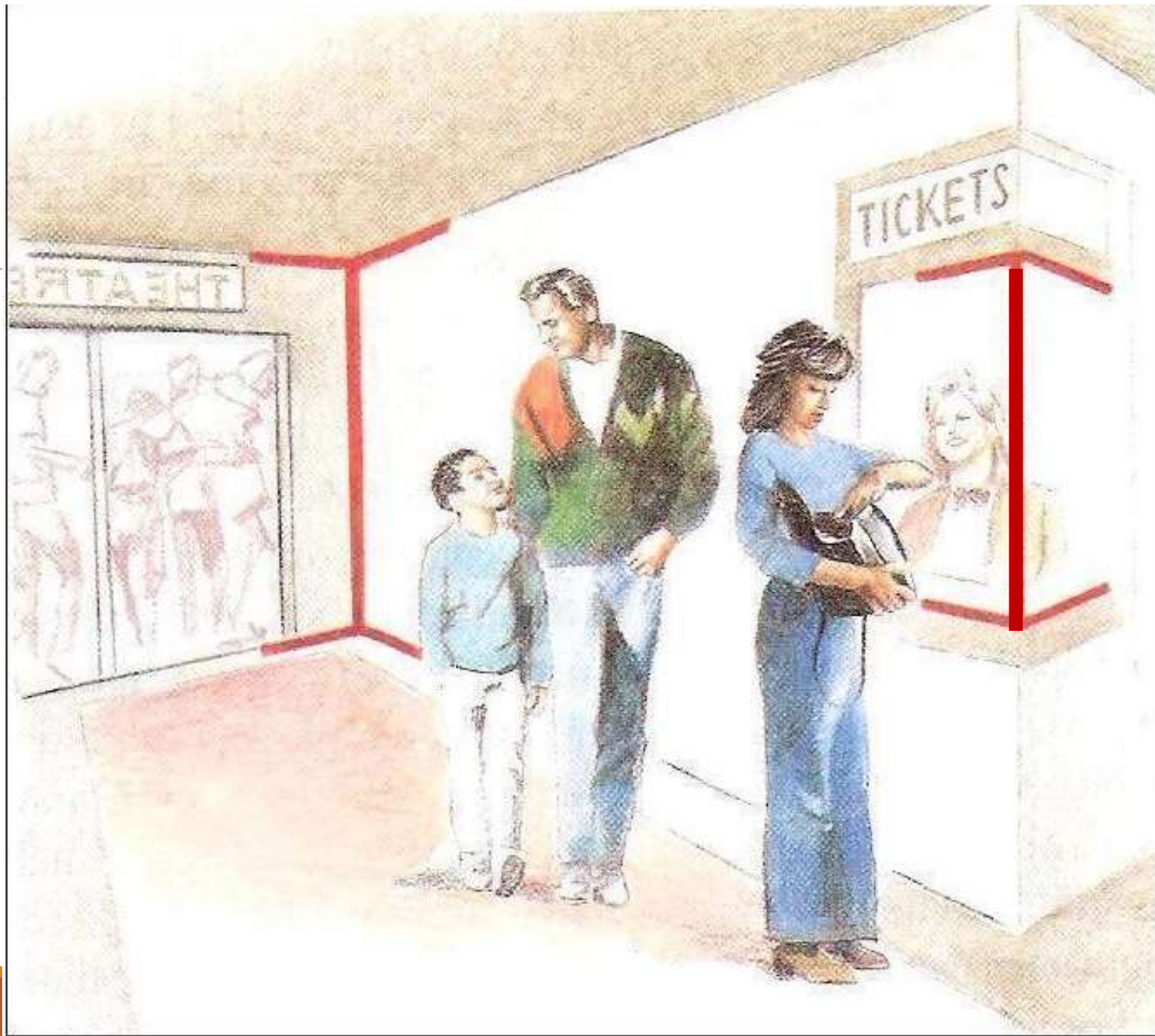


Zollner illusion



Jastrow – Which one is bigger





So?

- Perception is active and interpretative
- Interpretation is based on the visual data (“bottom-up”) and experience (“top-down”)
- You can partly choose the interpretation
- Interpretation of regular stimuli quickly becomes automatic
- Interpretation of irregular stimuli is heavily knowledge-based (e.g. Captcha)


CAPTCHA

- **Completely Automated Public Turing test to tell Computers and Humans Apart)**
- **Security vs Usability**

Match the Characters in the Picture [Help](#)


To start resetting your password, type your e-mail address and the characters shown in the picture below. [Why?](#)

E-mail address:

Picture: 

The picture contains 6 characters.

Characters:

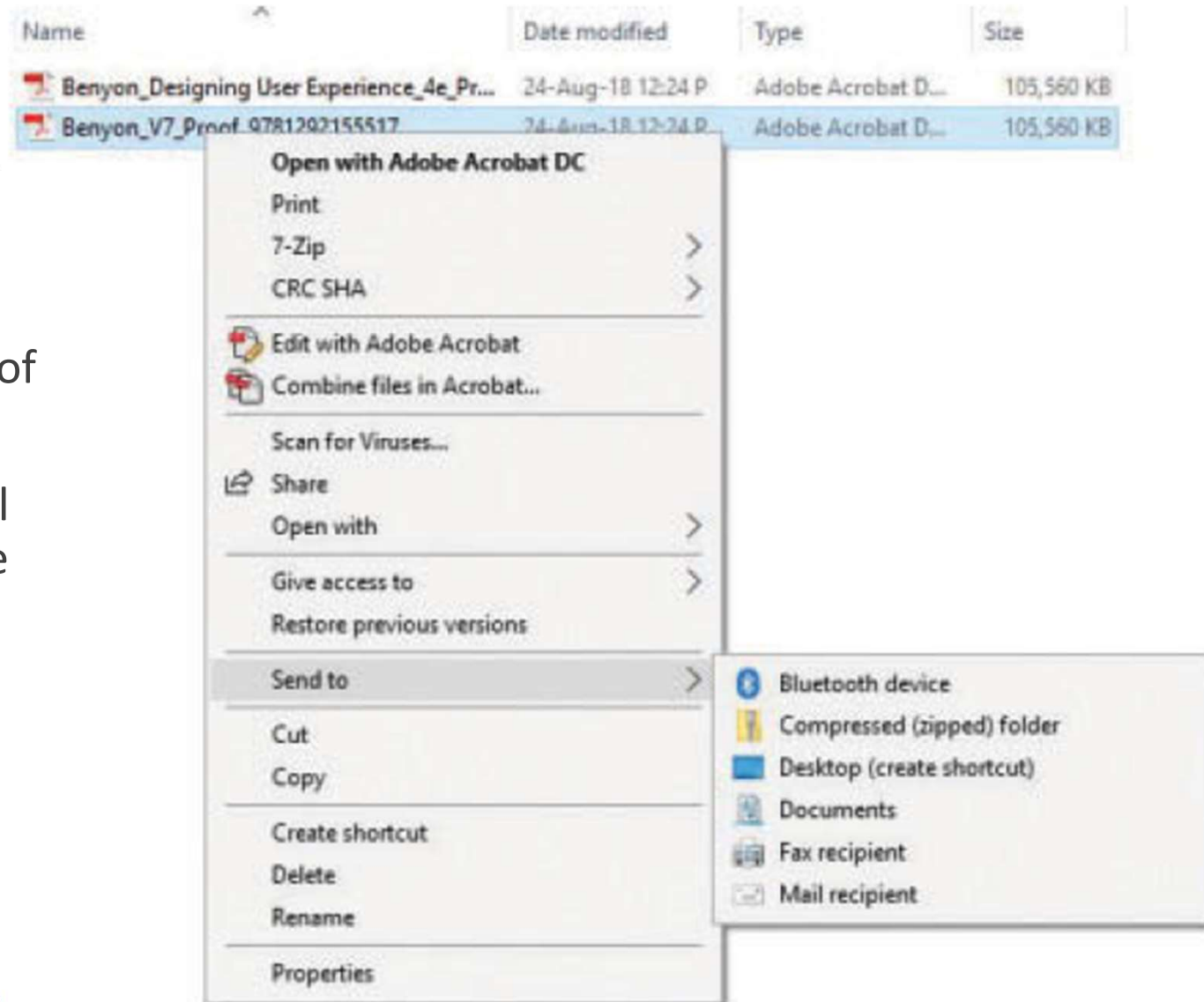
 **Microsoft Passport Network**
Account Services | Privacy Statement | Terms of Use
© 2005 Microsoft Corporation. All rights reserved.

Implications for design:

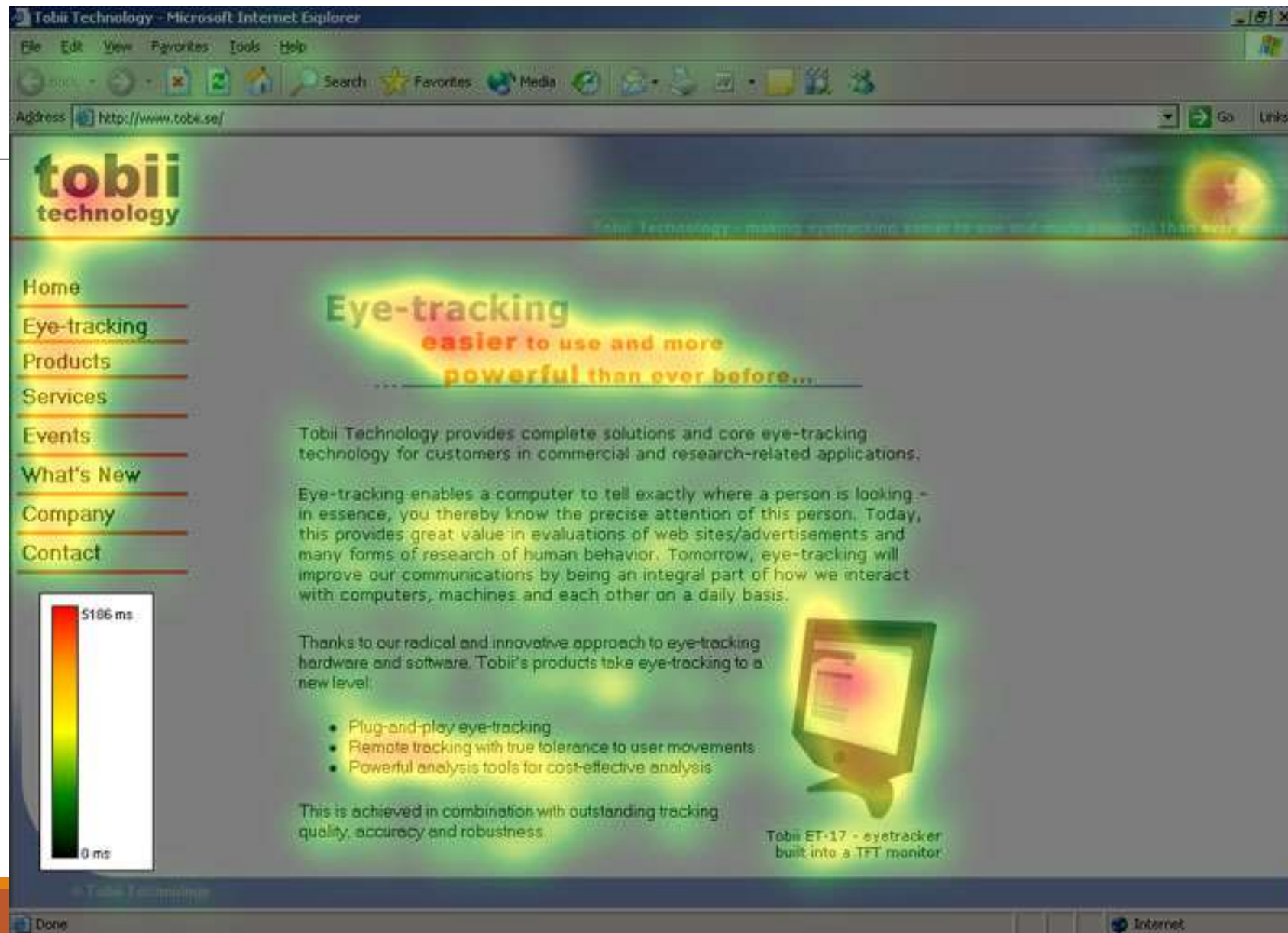
- Designer *never* sees exactly what the user sees
- Experience and repeated use narrow the interpretations of users
- Differences among users can lead to radically different perceptions of the information space

Chunking

- Chunking is a very effective way of reducing working memory load.
- Example; grouping of meaningful elements of a task into one place (or dialogue).



Eye Tracking Results



In HCI terms:

- Layout and structure of screens
 - supports perceptual grouping
 - aids visual scanning
 - aids location
 - affects aesthetics


What cues help?

- For speech
 - accent,
 - intonation, (remember the experiment)
 - familiarity (enables chunking)
- For vision
 - Color
 - Labels
 - Size
 - Emergent properties


In HCI terms...

- Adding labels to icons aids memorability (Rogers, 1989)
- Chunking occurs for both cognitive and physical responses
 - Menu design
 - Command sequences
- Even where not meaningful, repetition can lead chunk formation






Attention/Multitasking?




Kişisel Sağlık Sistemi




Merhaba, size nasıl yardım edebilirim?







Smart Assistant




My Visits




My Prescriptions




My Reports




My Diseases




My Tests




My Radiological Images



My Pathology Information




Epicrisis Information




My Materials and Devices


EXPLORE




COVID-19



Allergies



Informing Patients and Relatives



T.C. SAĞLIK BAKANLIĞI

Your profile Fill Rate: 90% full

21
Age

69 kg
Weight


158 cm
Height

Update

27.64 ⓘ
Body Mass Index


Calculate

Family physician information
Dr.



Quick sharing

Click here to share your health data using the quick sharing option.




Neyim Var

Would you like to know what your illness is?

You can learn your possible diagnosis and branches related to your current diseases by using NeyimVar application.

Click here to access "Neyim Var" application.



Make an Appointment

My Appointments

7 November

You do not have any appointment

İNFLUENZA

Please click to learn about influenza risk situation.

23 November

T.C. SAĞLIK BAKANLIĞI SBÜ ANKARA DR. ABDURRAHMAN YURTASLAN ONKOLOJİ EĞİTİM VE ARAŞTIRMA HASTANESİ

GÖZ HASTALIKLARI

★★★★★

Evaluate Show Details

25 October

T.C. SAĞLIK BAKANLIĞI BALGAT AĞIZ VE DİŞ SAĞLIĞI MERKEZİ

AĞIZ, DİŞ VE ÇENE CERRAHİSİ

★★★★★

Evaluate Show Details

25 October

T.C. SAĞLIK BAKANLIĞI BALGAT AĞIZ VE DİŞ SAĞLIĞI MERKEZİ

AĞIZ, DİŞ VE ÇENE CERRAHİSİ

★★★★★

Evaluate Show Details

My Data Access Informations

Reading as Perceptual chunking

- Most words are fixated at least partially
- Need to fixate closely (less than 10 characters taken in per fixation)
- Unusual words are fixated longer
- Skilled readers fixate and regress less

iT Is DiFflcUIT tO rEaD tHiS sENtenCe

Our perception system looks for regularity

So, context matters.....

e.g, “Find the letter t” problem:

All week, the weather was amazing. Even flowers in the park withered and became leathery under the sun's thermal rays. Children wearing no clothes bathed near the southern shore of the lake, while their mothers discussed other problems of psychotherapy and anesthesia. Panthers in the zoo surveyed the scene in a fatherly manner. As shadows lengthened, the air became ethereal and clouds began gathering on the horizon. "Bother" mumbled Alice, who was one of the sunbathers. "I've hardly begun my thesis on the theory of medieval atheism, and I'd rather go and buy the earthenware jug I saw on Friday"

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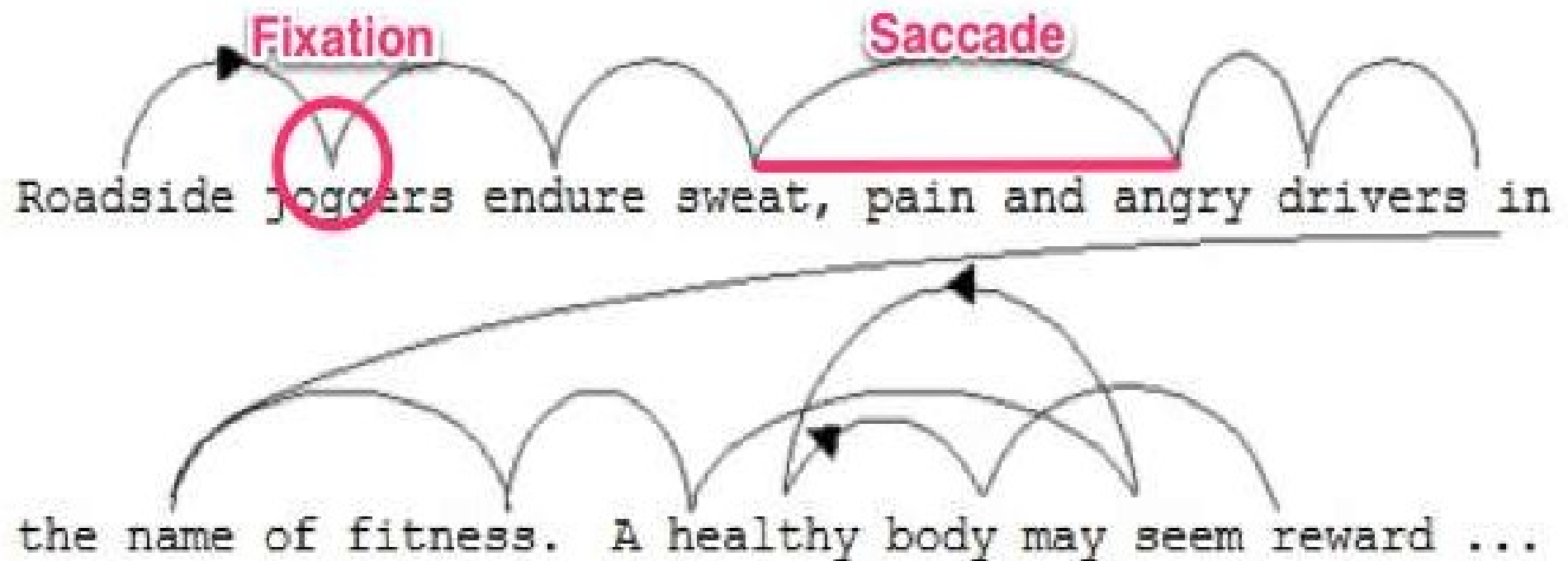
what happens?

- More people miss the t's in 'the' than in the other words
- Implies users chunk info automatically, & tend to move forward.
- reading backwards minimizes this

(correct answer is 36)

- Good score means you need to improve your English 😊

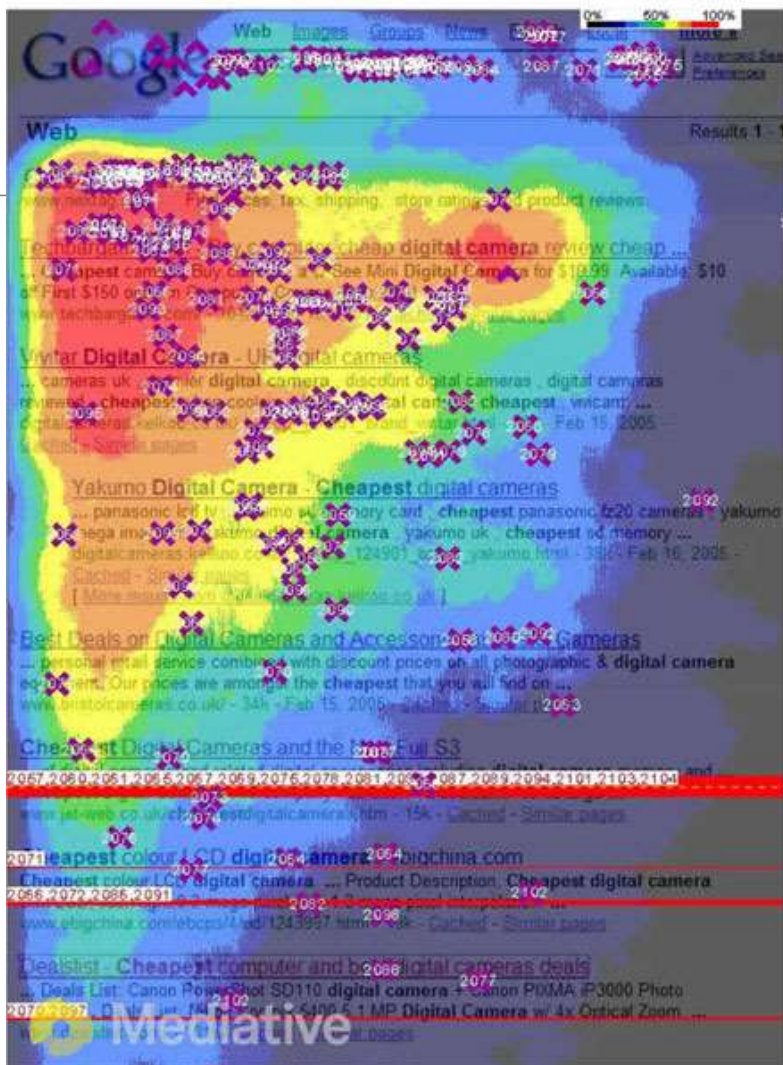
How do we read?



Recap

- Perception is active
- There are limits on our capacity to process information
- We “chunk” regularly occurring information
 - Chunking can be visual, verbal or physical
- We seek to impose order on events
- Unusual stimuli slow processing
- And Changes with experience (next slide)

2005



2014



Design and Record

Replay

Visualization

Unnamed Test

Setup

Help

Instruction Image Movie (AVI) Web Screen Rec External Video Scene Camera

1

Screen Recordin...



Start Recording

Başlat



Ağ Bağlantıları

kursat-edevlet - Tobii...

Ankara Büyükşehir Beledi...



09:35

Your upcoming assignment

- Evaluation of an interface by Cognitive modeling
- <https://www.cogtool.org/>
- Download and test it in your laptop. If you have problems contact with course assistant, Vahid.

▼ Week-7 Psychology + Intro to Evaluation strategies for usable interface design



Mental Models by Jacob Nielsen



week-7 Gestalt Principles- Our vision is optimized to see structure - Ch2

<https://www.cogtool.org/>

CogTool — Predictive human performance modeling for UI design

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CogTool is a general purpose UI prototyping tool with a difference – it automatically evaluates your design with a predictive human performance model (a “cognitive crash dummy”).

[Download for Windows](#)

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