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**Human Computer Interface**

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## Basic principles of HCI design



**Good design** involves understanding how users interact with computers, and **enabling them to do so effectively**

**Design** software/hardware, every day things... **the way not to cause problems** to the user

Design interaction...



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## Why/How to design HCI

Increase systems **efficiency**

Increase system **effectiveness**

Make system **easy to use**

Make system **pleasant to use**



## Why designing HCI might be difficult

Because of the **people**

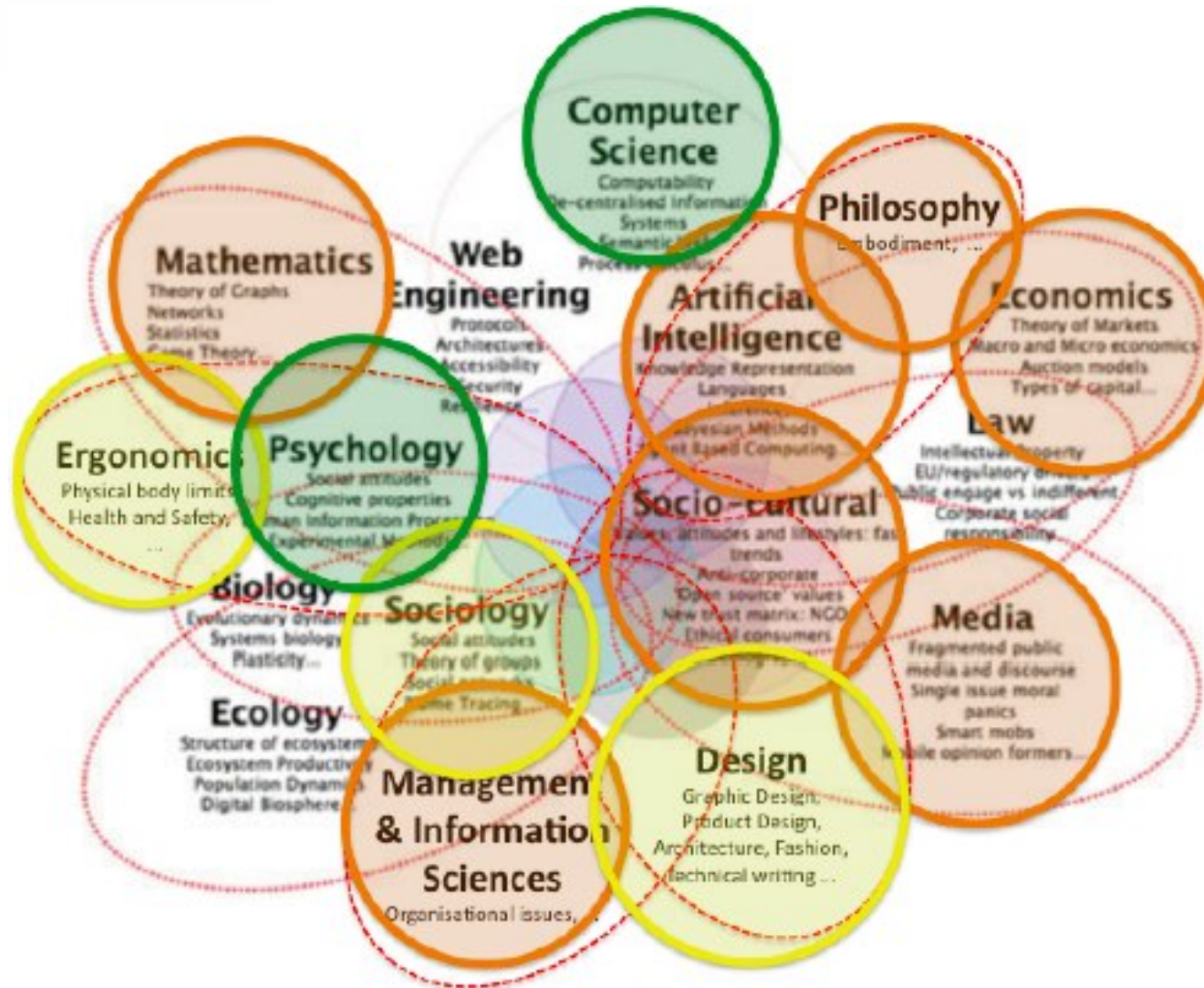
Because of the **mathematical complexity**

Because of **social constrains**

...

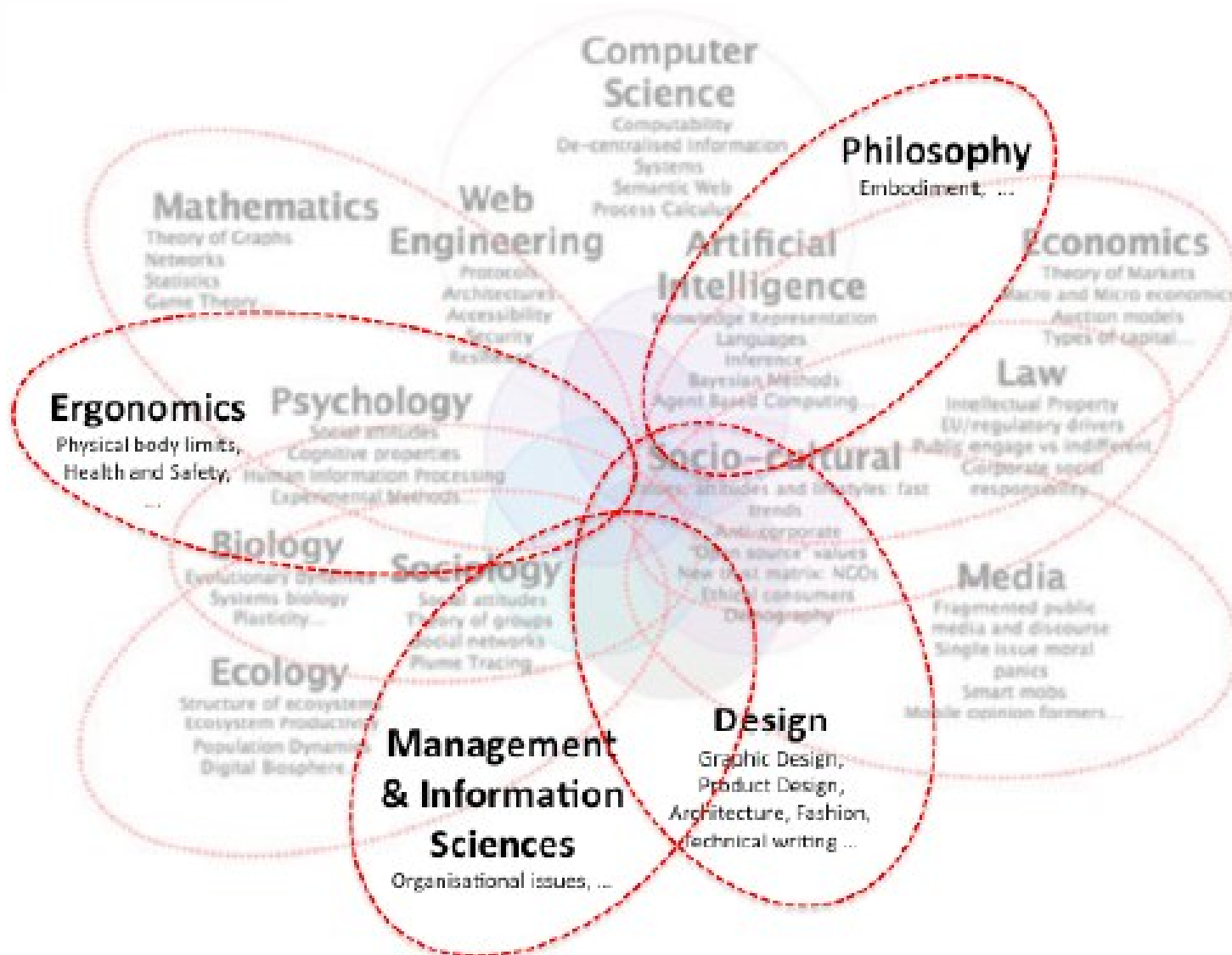


# The interdisciplinary character of HCI



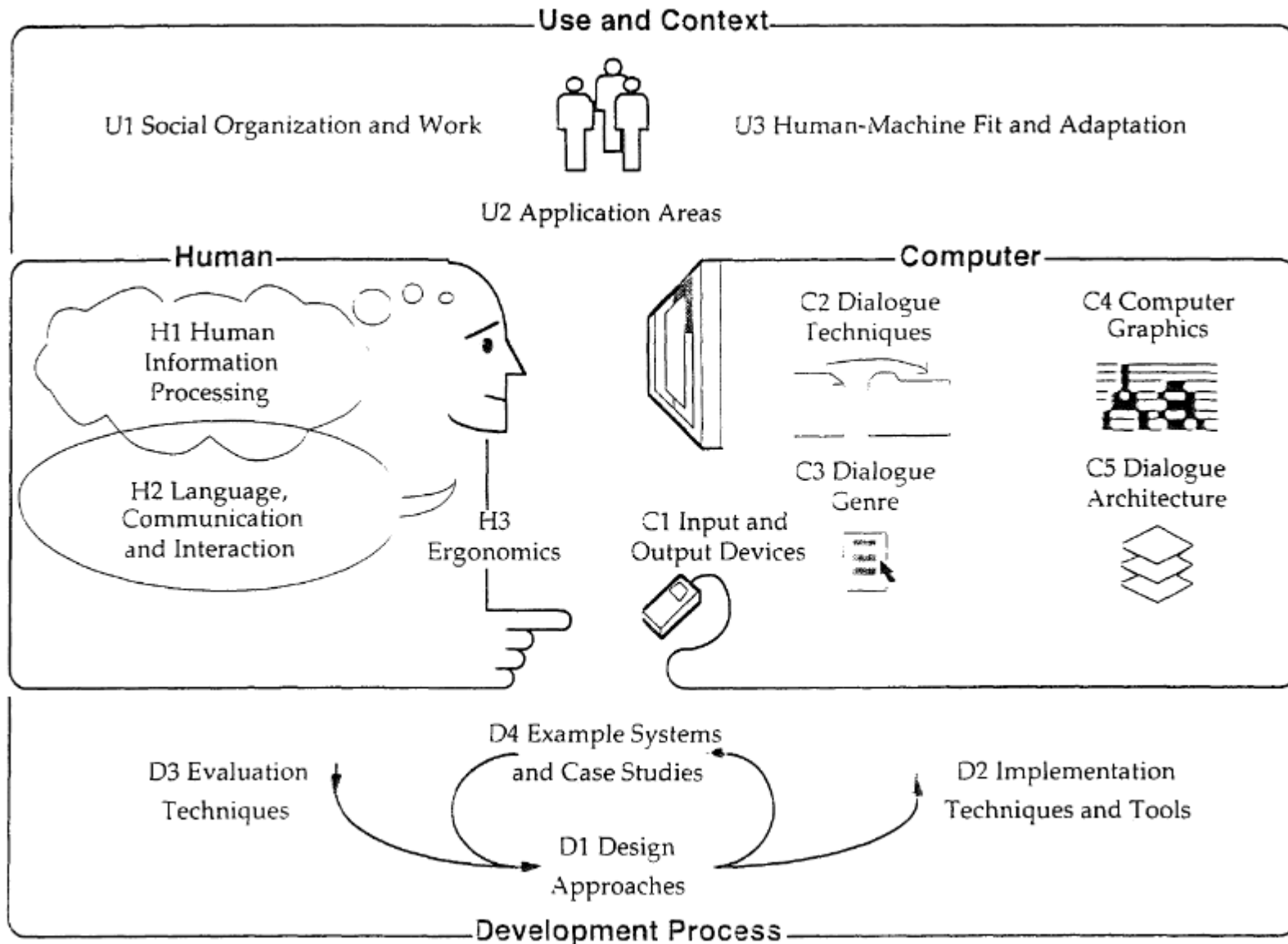


# The HCI butterfly





# Interrelationship among different disciplines







## Important rules

10 minute rule

Established by Nelson (1980)

If one can overtake system in 10 minutes it is a good system



### Visibility

- Users need to know what all the options are
- Users need to know how to access this options

### Feedback

- There is a reaction for every action

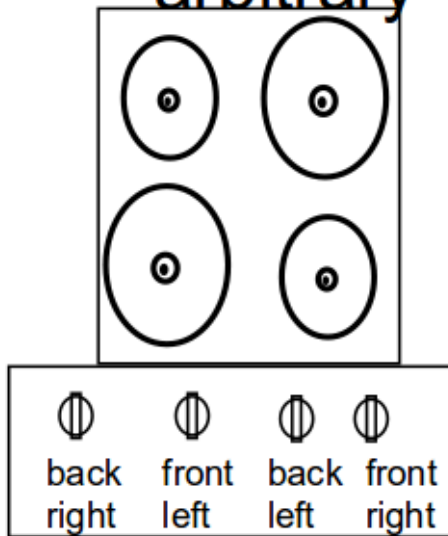
### Affordance

- If someone notice something, he/she nows how to use it



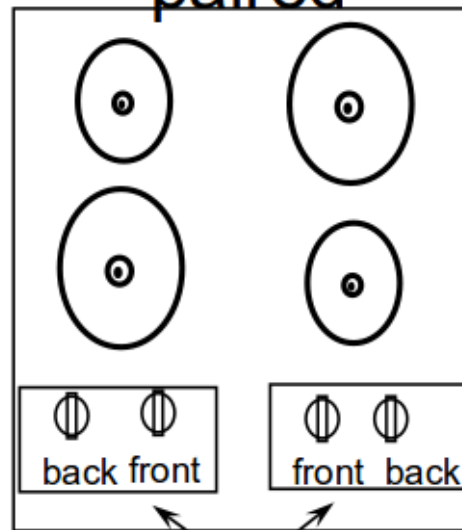
# Mapping

arbitrary



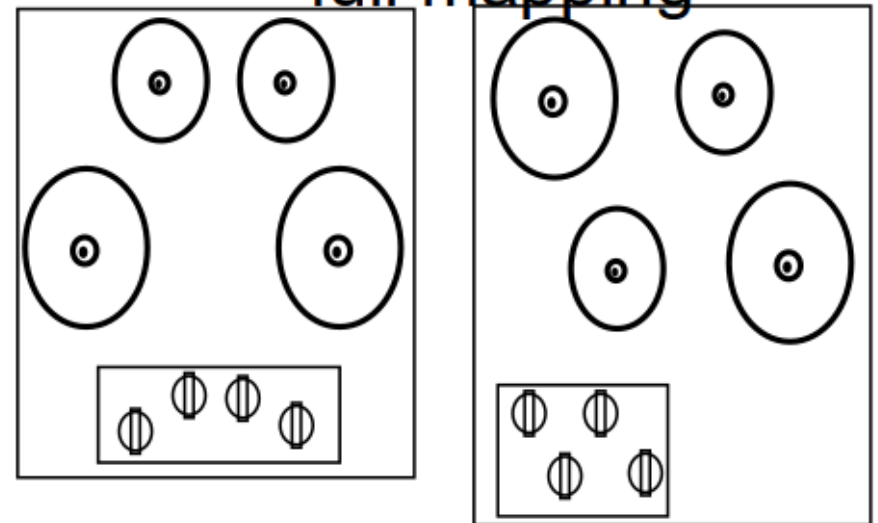
24 possibilities, requires:  
-visible labels  
-memory

paired



2 possibilities per side  
=4 total possibilities

full mapping





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## Bad design





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## Bad designe



<https://kanrawi.wordpress.com/category/goodbad-interface-design/>



# Bad designe

Password cannot contain any dictionary words and it must meet the following criterias:

- ✓ Password must be 12 characters long
- ✓ At least 1 character must be alphabetical AND at least 1 character must be a digit OR a special character: ! # \$ %
- ✓ At least 6 characters must occur only once in a password
- ✓ Passwords cannot contain any string that is also contained in the username
- ✓ Passwords cannot contain any common strings such as a sequential series of letters (abcd) or a sequential series of numbers (1234) or pattern of numbers (2468)

Old Password:

New Password:  ✓

Confirm New Password:  ✓

\* - Denotes Required Information

> 1 Donation > 2 Confirmation > Thank You!

### Donor Information

First Name\*

Last Name\*

Company

Address 1\*

Address 2

City\*

State\*

Zip Code\*

Country\*

Phone

Fax

Email\*

Donation Amount\*  None  \$50  \$75  \$100  \$250  Other  
(Check a button or type in your amount) Other Amount \$

Recurring Donation (Check if yes)  I am interested in giving on a regular basis.  
Monthly Credit Card \$  For  Months

### Honorarium and Memorial Donation Information

I would like to make this donation  To Honor  In Memory of

Name

Acknowledge Donation to

Address

City

State

Zip

### Additional Information

Please enter your name, company or organization as you would like it to appear in our publications:

Name

I would like my gift to remain anonymous.

My employer offers a matching gift program. I will mail the matching gift form.

Please save the cost of acknowledging this gift by not mailing a thank you letter.

Comments (Please type any questions or feedback here)

How may we contact you?  E-mail  Postal Mail  Telephone  Fax

I would like to receive newsletters and information about special events by:  E-mail  Postal Mail

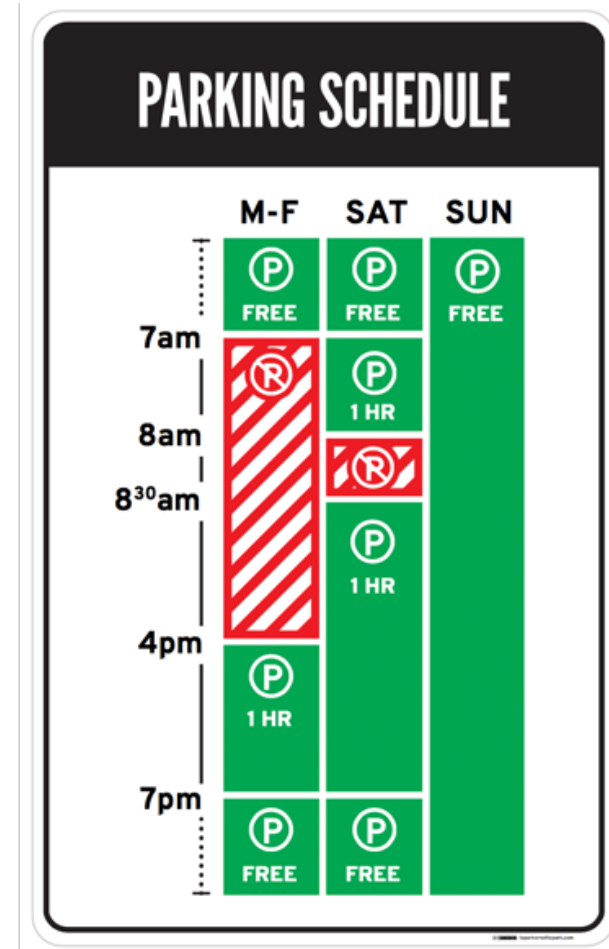
I would like information about volunteering with the

Donate online with confidence. You are on a secure server.  
If you have any problems or questions, please contact support.





- Information overload







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## HCI good design

Home work for next week



Touch interface

Tangible interface

**Gesture recognition based UI**

Voice activated

**Eye tracking**

**Brain Computer Interface**

Alternative communication (buttons, knobs, sensors)



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# Touch/Tangible



## Windows 8 Touch Language

Windows 8 touch language



Press and hold  
to learn



Tap  
for primary action



Slide  
to drag



Swipe  
to select



Pinch  
to zoom



Swipe from edge  
for system and app UI

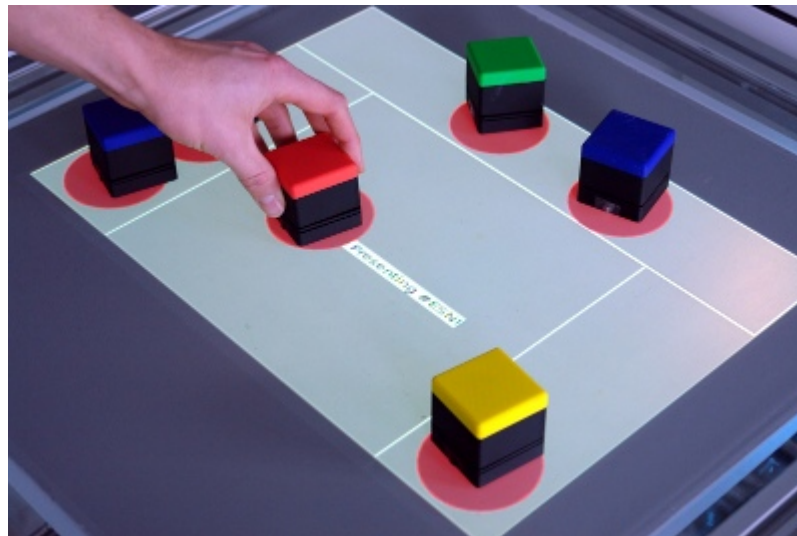
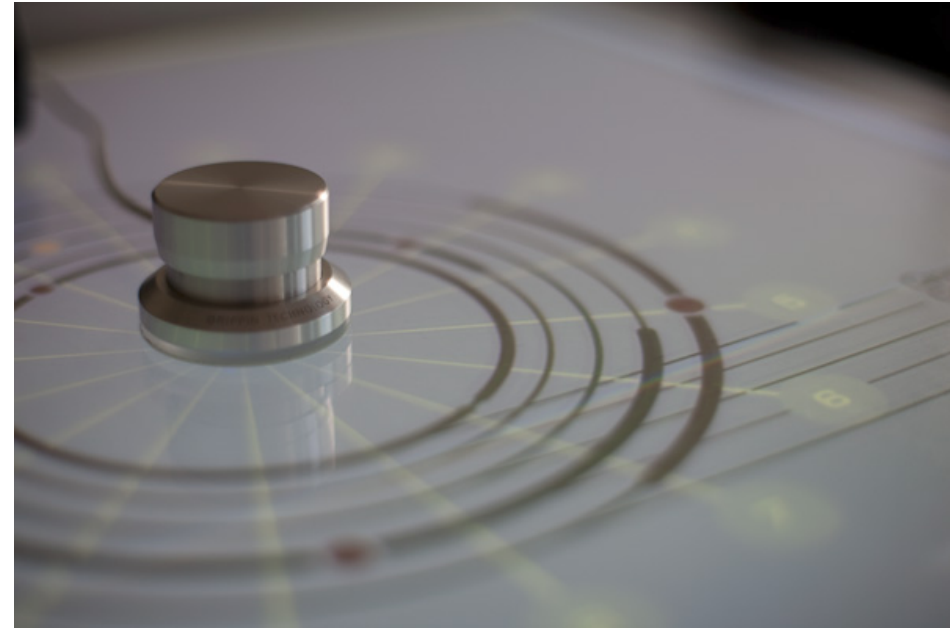


Rotate  
to rotate



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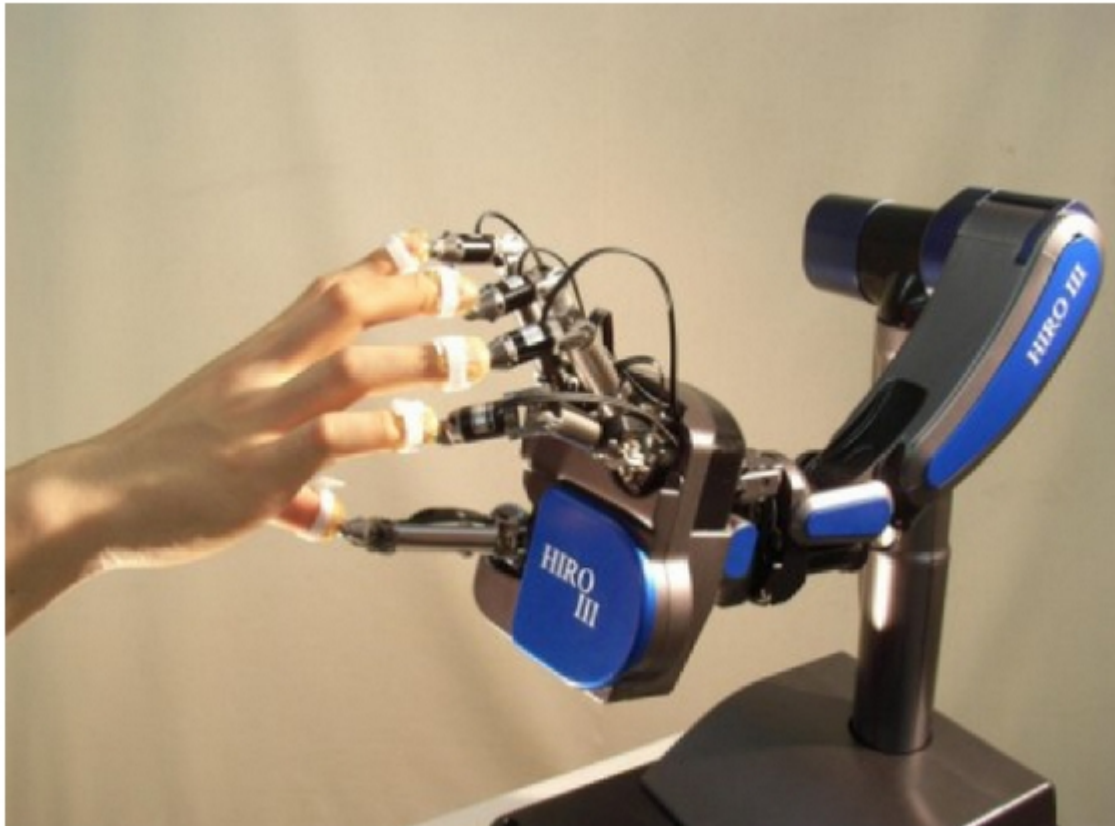
# Touch/Tangible





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# Haptic Interface





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## Gesture recognition





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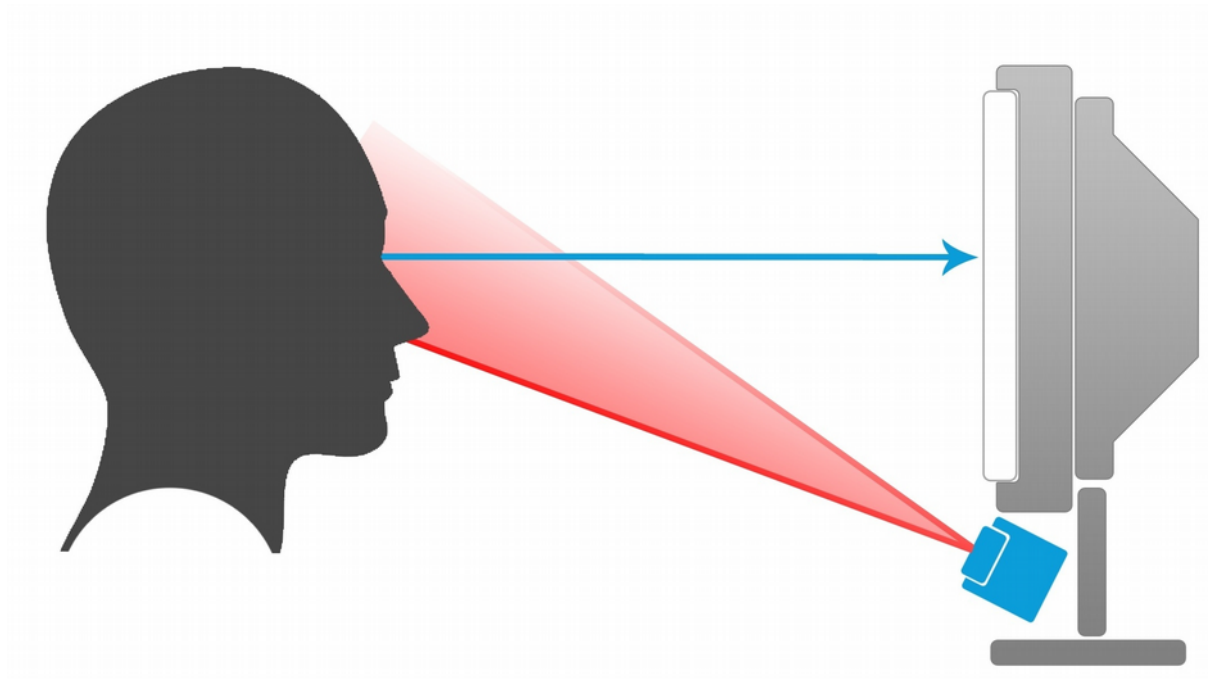
# Man Machine Interaction





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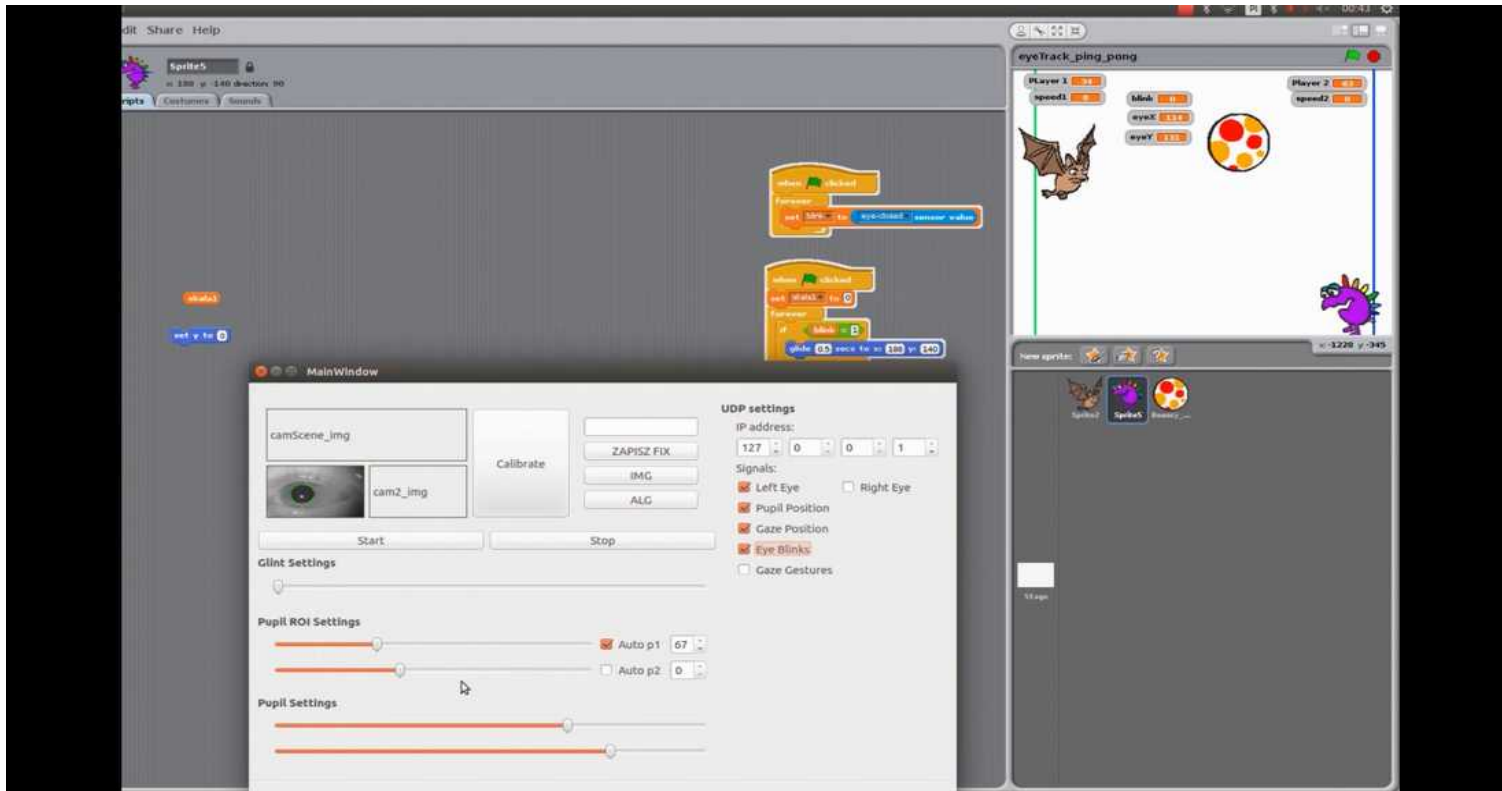
## Eye tracking







# Eye tracking



# BCI

