

IFT 2905: INTERFACES PERSONNE-MACHINE PERFORMANCE HUMAINE

<http://tiny.cc/ift2905>



Image © Katerina Kamprani, www.theuncomfortable.com

Mikhail Bessmeltsev

Certaines diapos de Bernhard Thomaszewski

ORGANISATION

1. Capsules
2. Équipes
 - pas de changement après jeudi
3. Démonos: jeudi
4. Devoir 1: disponible jeudi
5. Microdevoir 1 (jeudi ou lundi prochain)

Est-ce une bonne interface?



Est-ce une bonne interface?



Est-ce une bonne interface?



Est-ce une bonne interface?

[Login](#)**RYANAIR**[HOME](#) • [F.A.Q.](#) • [FEES](#)

FLIGHTS SERVICES CAR HOTEL PAYMENT ITINERARY

Passenger(s)

All passenger names must match those in the passport/accepted travel document

Duplicate names must not be entered for passengers [?](#)

Passenger 1

Title First name Last name

Travel Insurance

	INSURANCE	INSURANCE PLUS
Medical Expenses up to £2,500,000 (excess of £75, double excess for aged 65+)	✓	✓
Personal Belongings up to £1,500 (excess of £75)*	✓	✓
Cancellation circumstances (excess of £15)	✓	✓
Ticket Refund In case of Ryanair		✓

[VIEW POLICY](#)

☐ Please select a country of residence

- United Kingdom
- Ireland
- Germany
- Spain
- France
- Italy
- Sweden
- Austria
- Belgium
- Czech Republic
- Denmark
- Don't Insure Me
- Finland
- Hungary
- Latvia
- Lithuania
- Malta

Brignull
Harry

Already insured? ☐ Don't insure me? ☐ in the drop down box.

BOOKING SUMMARY

► Passenger(s)

 **London (Stansted) → Faro**
Sun, 31 Aug 2014 20:55 - 23:45

▼ **1 Adult, 29.99 GBP**

1 x Adult Fare 29.99 GBP

• Discount Pay by debit card: 29.99 GBP
• Pay by credit card: 30.59 GBP

TOTAL 29.99 GBP

Est-ce une bonne interface?

Cr

Where

Email

☐

☒

Sh

Saint Pierre and Miquelon

Saint Vincent and the Grenadines

Samoa

Sao Tome And Principe

Saudi Arabia

Serbia

Singapore

Slovakia

Slovenia

Solomon Islands

South Africa

South Korea

Spain

Suriname

Sweden

Switzerland

Taiwan

Thailand

Timor Leste

Trinidad And Tobago

Turkey

Turks and Caicos Islands

Ukraine

United Arab Emirates

United Kingdom

✓ United States

Uruguay

Vanuatu

Vatican City

Venezuela

s. View our

Sign In Or Sign Up

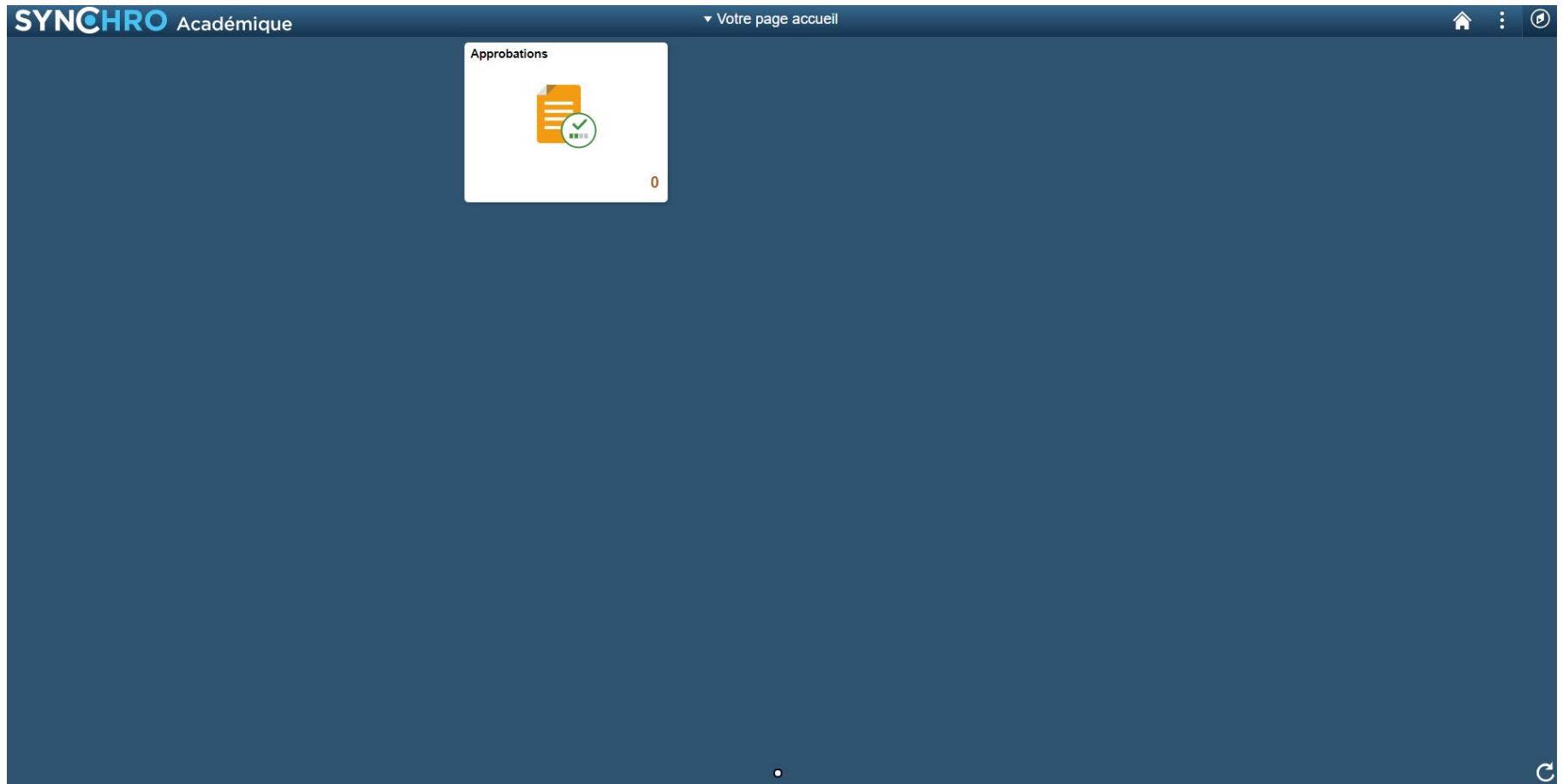
Sign in to check out faster.

Sign In

[Sign Up](#)

Last Name*

Est-ce une bonne interface?



Est-ce une bonne interface?

The screenshot displays the StudiUM web interface. At the top, a dark navigation bar contains the University of Montreal logo, the text 'StudiUM', and links for 'Accueil', 'Mes cours', 'Liste des cours', 'Aide', 'Français (fr)', and a user profile for 'Mikhail Bessmeltsev'. A left sidebar lists navigation options: 'IFT2905-A-H21', 'Participants', 'Badges', 'Compétences', 'Notes', 'Téléchargement', 'Introduction', 'Ressources', 'Démonstrations', 'Accueil', 'Mon StudiUM', 'Calendrier', 'Fichiers personnels', 'Mes cours', and a list of course sections. The main content area is titled 'IFT2905-A-H21 - Interfaces personne-machine' and includes a breadcrumb trail: 'Accueil / Mes cours / IFT2905-A-H21 / Introduction / Nouvelles / La première vidéo (ou deux)'. Below this, a search bar and a 'Recherche (forums)' button are visible. The section 'Nouvelles' is active, showing 'La première vidéo (ou deux)'. A post by 'Mikhail Bessmeltsev' from January 13, 2021, contains a welcome message and links to Zoom sessions and slides. At the bottom of the post, there are buttons for 'Permalien', 'Modifier', 'Supprimer', 'Répondre', and 'Exporter vers le portfolio'. Navigation links for 'Début du cours' and 'Équipes et Démo du 21 Janvier' are also present.

IFT2905-A-H21 - Interfaces personne-machine

Accueil / Mes cours / IFT2905-A-H21 / Introduction / Nouvelles / La première vidéo (ou deux)

Recherche (forums)

Nouvelles

La première vidéo (ou deux)

⚙️ Réglages ▾

Équipes et Démo du 21 Janvier ▶

◀ Début du cours

Réponses emboîtées ▾ Déplacer cette discussion vers... ▾ Déplacer

La première vidéo (ou deux)
par Mikhail Bessmeltsev, mercredi 13 janvier 2021, 12:36

Bonjour à tous!

Voilà les formalités: https://umontreal.zoom.us/rec/share/FLSncpriHaEm89ut07L9-iMkKmyJXzUEGimfc6ARfCNQdVbwk60hTEKjNXSI4FT_0kIM4S3clqsj_pnm
et l'introduction à notre cours: <https://umontreal.zoom.us/rec/share/shU87cuVYRwMd2hLtyhDKYzV7-RSgD1QvB46j-h-5zTJ8XnyoxnrRTYYOjQbZOZ.pZsxtOy3m5UtHvWv>
Svp regardez-les avant notre cours le lundi (18 janvier), qui sera à 10.30, sur Zoom (tiny.cc/ift2905_zoom). À plus tard!

Les diapos sont là: <http://tiny.cc/ift2905>

Permalien Modifier Supprimer Répondre Exporter vers le portfolio

◀ Début du cours

Équipes et Démo du 21 Janvier ▶

Mais pourquoi?

PERFORMANCE HUMAINE & COGNITION

La performance humaine est l'ensemble des capacités mentales et physiques tel que liées aux processus **cognitifs**

Exemples:

à quelle vitesse peut-on appuyer sur un bouton? (fait partie)

combien de temps peut-on survivre à -24C? (ne fait pas partie)

Qu'est-ce que la cognition?

LA COGNITION

Qu'est-ce que la cognition?

La cognition est l'ensemble des processus mentaux qui se rapportent à la fonction de connaissance

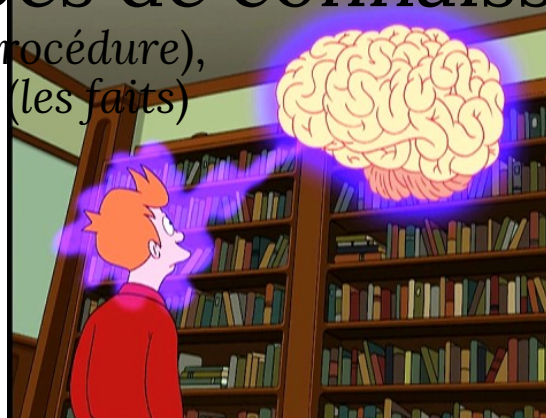
C'est à dire

acquérir des connaissances
utiliser des connaissances

Différents types de connaissances

le savoir-faire (*de procédure*),
le savoir technique (*les faits*)
les langues

...

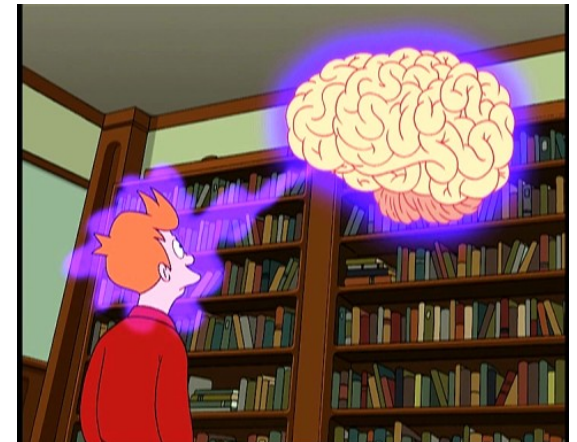


LA COGNITION

Qu'est-ce que la cognition?

Les composants de la cognition

- perception
- langage
- apprentissage
- mémoire
- résolution de problème
- prise de décision
- attention



LA COGNITION

Pourquoi la cognition est-elle importante pour l'interaction personne-machine?

- nous voulons créer des interfaces qui soutiennent les utilisateurs humains dans ce qu'ils font
- nous devons connaître les capacités et les limites humaines fondamentales
- but: créer des systèmes interactifs et faciles à utiliser qui s'adaptent d'une façon optimale aux tâches et aux besoins des utilisateurs

L'ORDINATEUR CONTRE L'HUMAIN

Les points forts des humains

- Détection de signal sous bruit
- Reconnaissance de configurations (p.e., scènes) complexes
- Concentration sur l'essentiel
- Adaptation à des situations inattendues
- Aptitude à apprendre
- Mémoriser des informations cohérentes
- Intuition
- ...

Les points forts des ordinateurs

- Détection/reconnaissance de signaux connus
- Réaction rapide et fiable aux signaux connus
- Supériorité si les problèmes peuvent être formulés algorithmiquement
- Mesurer et compter
- Stocker de grandes quantités de données incohérentes
- Répétition fiable et sans fatigue des opérations
- ...

SYSTÈMES MOTEURS ET SENSORIELS

Systèmes sensoriels

Vue (visuelle)
Audition (auditive)
Touche (haptique)
Odeur (olfactive)
Goût (gustatif)
Équilibre et accélération
(vestibulaire)
Conscience du corps
(proprioception, sens kinesthésique)
Température
(réception de chaleur)

Systèmes moteurs

- Bras, mains, doigts
- Tête, yeux
- Système vocal
- Jambes, pieds, orteils
- Mâchoire, langue

LLM AIN

Christophe Lopez^{1*}, Michel Toupet^{2,3}, Christian van Necho^{3,4} and Alexis Bozorg G

¹ Aix-Marseille
France, ² In
³ Otolaryng
Image and

Keywords:
depersons

Editorial

Role of I

Ototoxicity, the vestibular and eye-dizziness, depersonalization, dizziness, contribute to disorders in individual memory years reviewed cognitive of age on. These studies in demen-

OPEN ACCESS

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Michael Strupp,
Ludwig Maximilian University of
Munich, Germany

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Christophe Lopez

REVIEW ARTICLE

Front. Physiol., 06 July 2020 | <https://doi.org/10.3389/fphys.2020.00770>

Effect of Exercise-Related Factors on Time

David G. Behm* and Tori B. Carter

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The concept of time whether considered through the lenses of physics or psychology, time perception can have serious implications in sport, fitness and work environments with many time constrained sports (i.e., basketball, North American football, soccer, and others), and work environments (i.e., workers who need to synchronize their activities). In addition, time distortions may play a role in exercise adherence. Some studies suggest that exercise activities that seem protracted (time dilation). Two predominant models (the beat frequency model) emphasize the perception of the number of beats per second (BPS) activating and coordinating cortical structures, respectively. A number of factors influence state of health and fitness, mental concentration and exercise intensity, which in turn affect time perception. However, with the importance of time perception for work and health areas. Since work, sports, and exercise can involve an integration of multiple tasks and interventions that need further investigations. The multiplicity of variables involved in this underdeveloped but fruitful field for future research. Thus, the objective of this review is to explore psychological factors affecting human perception of time and the implications for work, sports, and health.

Topical Review

PAIN

OPEN

Symptom perception, placebo effects, and the Bayesian brain

Giulio Ongaro^{B,*}, Ted J. Kaptchuk^{b,c}

1. Introduction

The standard and ideal biomedical model of symptom perception treats the brain largely as a passive stimulus-driven organ. It embraces the notion that the brain absorbs sensory signals from the body and converts them, directly, into conscious experience. Accordingly, biomedicine operates under the assumption that symptoms are the direct consequences of physiological dysfunction and improvement is the direct consequence of the restoration of bodily function. Despite its success, the biomedical model has failed to provide an adequate account of 2 well-demonstrated phenomena in medicine: (1) the experience of symptoms without pathophysiological disruption, and (2) the experience of relief after the administration of placebo treatments. This topical review advances the idea that "predictive processing," a Bayesian approach to perception that is rapidly taking hold in neuroscience, significantly helps accommodating these 2 phenomena. It expands on recent high-quality empirical work on predictive processing^{17,19,24} and outlines, more broadly, how Bayesian models offer an altogether different picture of how the brain perceives symptoms and relief.

2. The Bayesian brain

The nervous system is constantly dealing with a continuous and potentially overwhelming stream of varying signals coming from our body and senses. For the sake of adaptation, the brain must turn this confused play of sensory inputs and neural firings into a reliable perception of the world. Debate in cognitive science has revolved around how exactly the brain accomplishes this task. While previous theories, in line with the current biomedical model of disease, viewed perception mostly as a bottom-up readout of sensory signals, emerging Bayesian models suggest, instead, that perception is cognitively (mostly nonconsciously) modulated,

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

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and might be best viewed as a process of prediction, based on an integration of sensory inputs, prior experience, and contextual cues.^{9,10,15,21}

The key question is that to perceive the world, the brain follows a theory of probability known as Bayes rule. In its mathematical form, the rule updates the likelihood of a given hypothesis (or "prior"), given some evidence, by considering the product of the likelihood and the prior probability of the hypothesis.²¹ Over rapid time scales, the brain implements Bayes rule by continuously generating a top-down cascade of neurally encoded (mostly nonconscious) hypotheses about the state of the body and world. This top-down flow of hypotheses is met by the bottom-up stream of sensory inputs coming from the senses. Any mismatch between predicted input and actual input results in "prediction error," which prompts the system to revise its hypotheses. Bottom-up perception is thus inseparable from top-down prediction. Some of the hypotheses that account for the most abstract and general features of the world are "built-in" by evolution; others are amenable to progressive refinement through developmental learning. Throughout one's lifespan, the nervous system engages in the continuous updating of these priors to better predict the next incoming sensory inputs and minimize error.

A central implication of the theory is that what we perceive is not the world as it actually is, but the brain's best guess of it, continuously refined by incoming sensory evidence.^{10,21} Visual perception, the domain from which much of the evidence for the Bayesian brain has emerged, offers the most intuitive way to grasp its key principle. To mention a simplistic example, sticks in a forest that is infested by snakes might at first be perceived as snakes, until we get a more refined view that updates the hypothesis.

Importantly, the interplay between descending predictions and ascending signals that lie at the heart of predictive processing is flexibly modulated by the "precision" (or "inverse variance," in statistical terms) of hypotheses and sensory evidence. Faced with the task of determining how likely a given set of inputs represents a predicted state, the brain uses prior experience and subtle contextual cues to determine their precision. The example of seeing sticks as snakes represents a case where highly precise hypotheses shaped by previous experience (knowing what a snake looks like, knowing that snakes inhabit the forest) override imprecise visual inputs. Indeed, the Bayesian brain model is able to explain how, in contexts of precise predictions and imprecise

PERFORMANCE HUMAINE

Les processus cognitives et moteurs sont complexes

Comment intégrer ces aspects dans la conception d'interfaces?

On a besoin des modèles théoriques qui simplifient et formalisent ces processus
Quelques exemples

Model
Human
Processor

GOMS

Fitts' Law

MODEL HUMAN PROCESSOR

- Développé par S. Card, T. Moran, A. Newell
(The Psychology of Human-Computer Interaction, 1983)

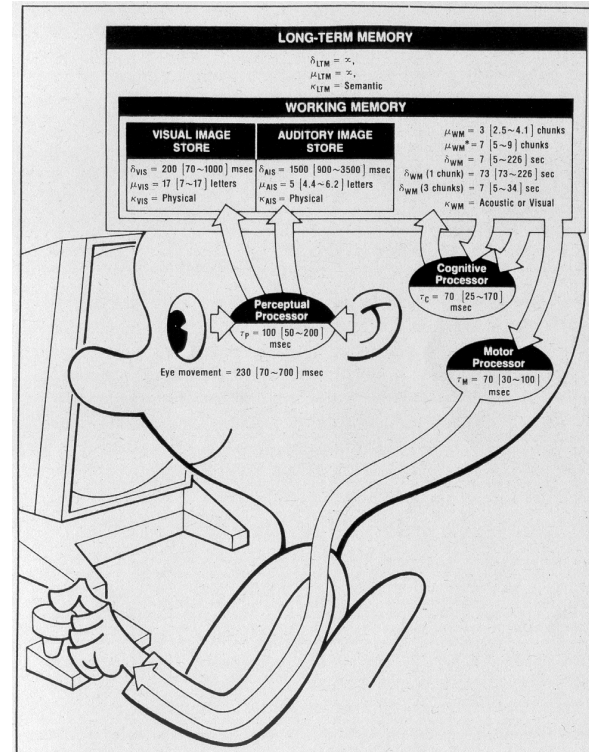
<http://www2.parc.com/istl/groups/uir/publications/items/UIR-1986-05-Card.pdf>

Modèle informatique donnant une compréhension abstraite du cycle cognitif

- perception (input)
- traitement (processing)
- action (output)

Peut être appliqué pour estimer:
Temps d'exécution
Taux d'erreur

...



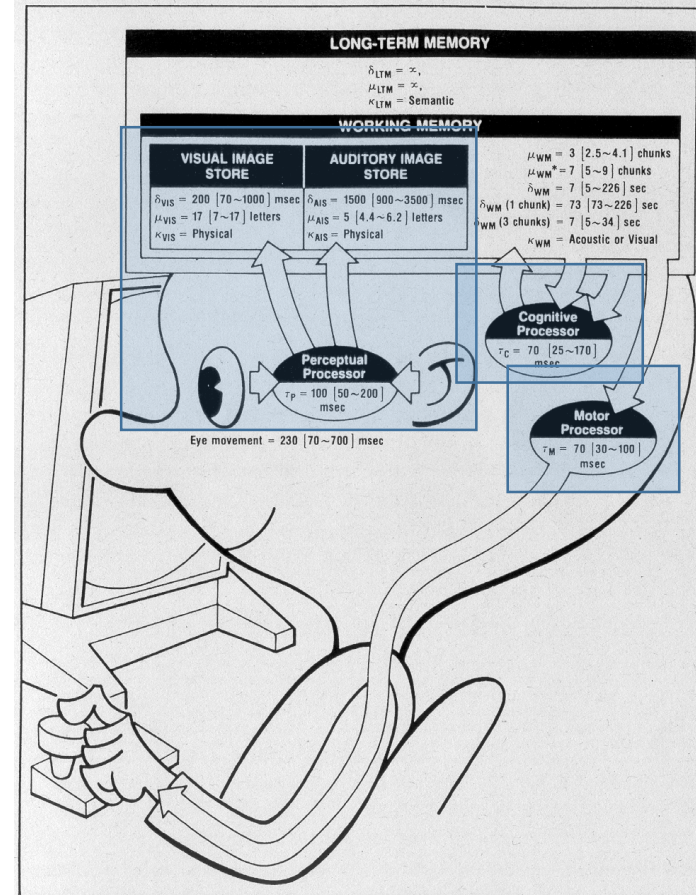
MODEL HUMAN PROCESSOR

Trois processeurs avec mémoire associée

1. Processeur perceptuel
Capteurs et tampons
2. Processeur cognitif
Travail sur contenu de la mémoire de travail
3. Processeur moteur
Génère des mouvements

Chaque processeur a un temps d'exécution associé

Le temps d'exécution globale du système est la somme des trois

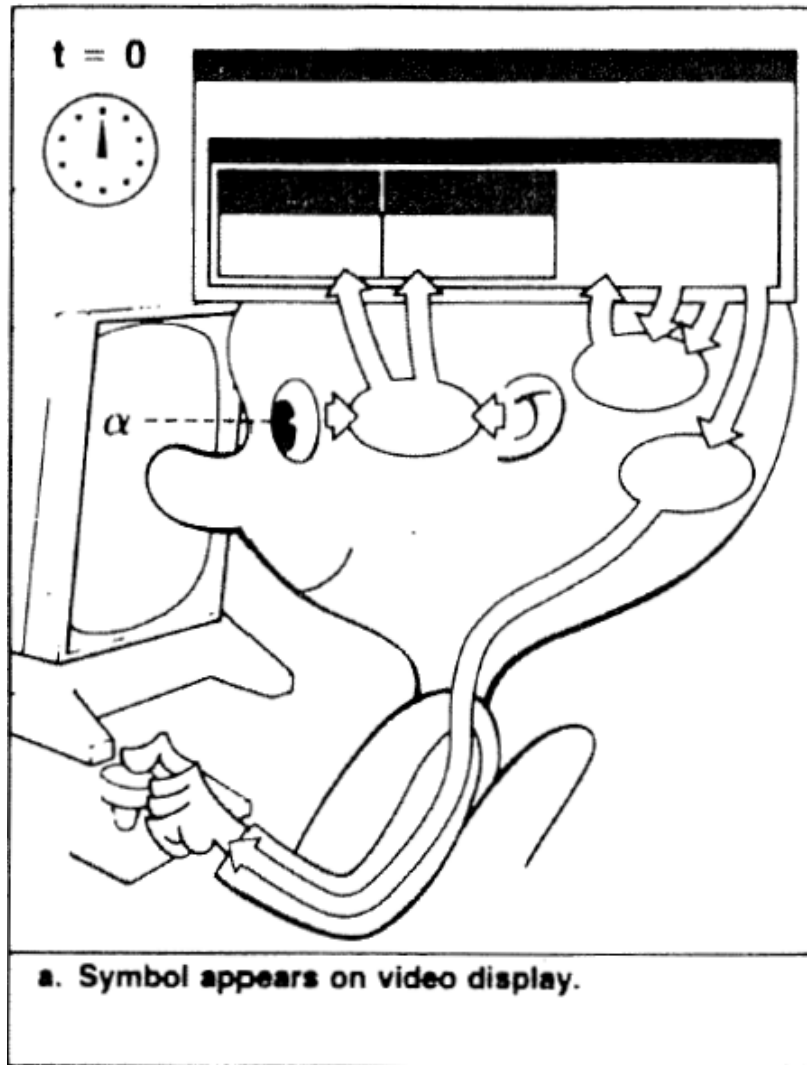


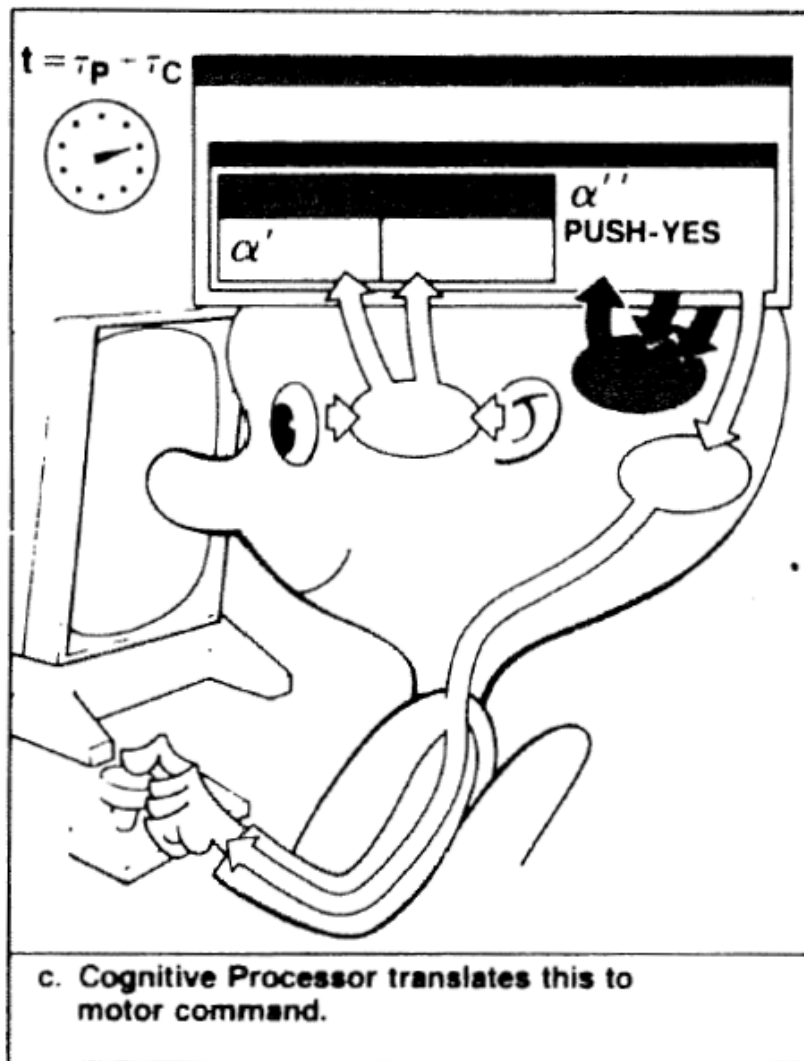
MHP – EXEMPLE

*Comment fonctionne ce modèle
informatique d'humain?*

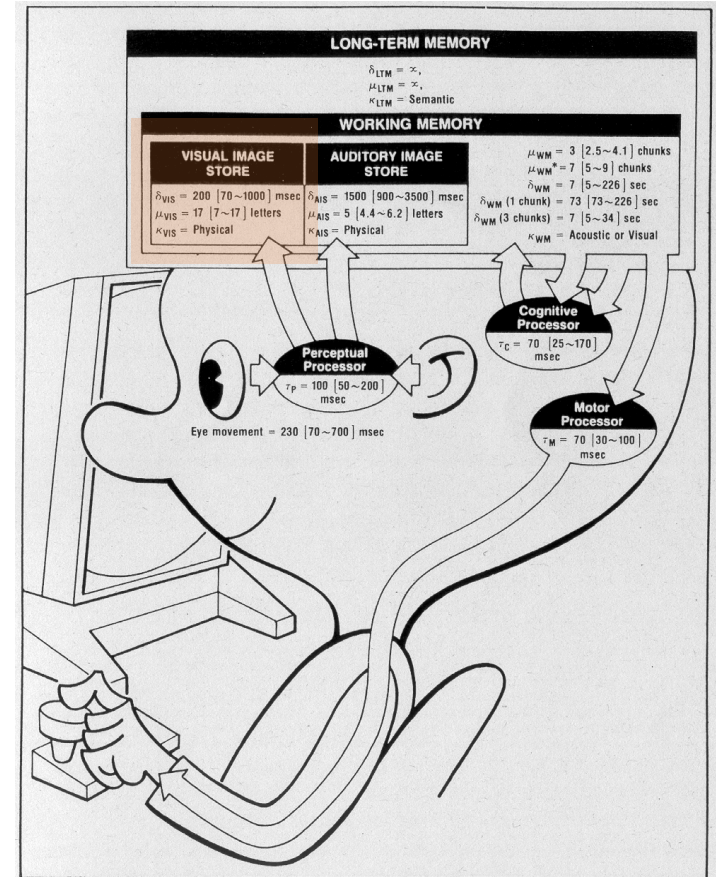
Exemple

l'utilisateur observe un caractère sur l'écran
il réagit en appuyant sur un button

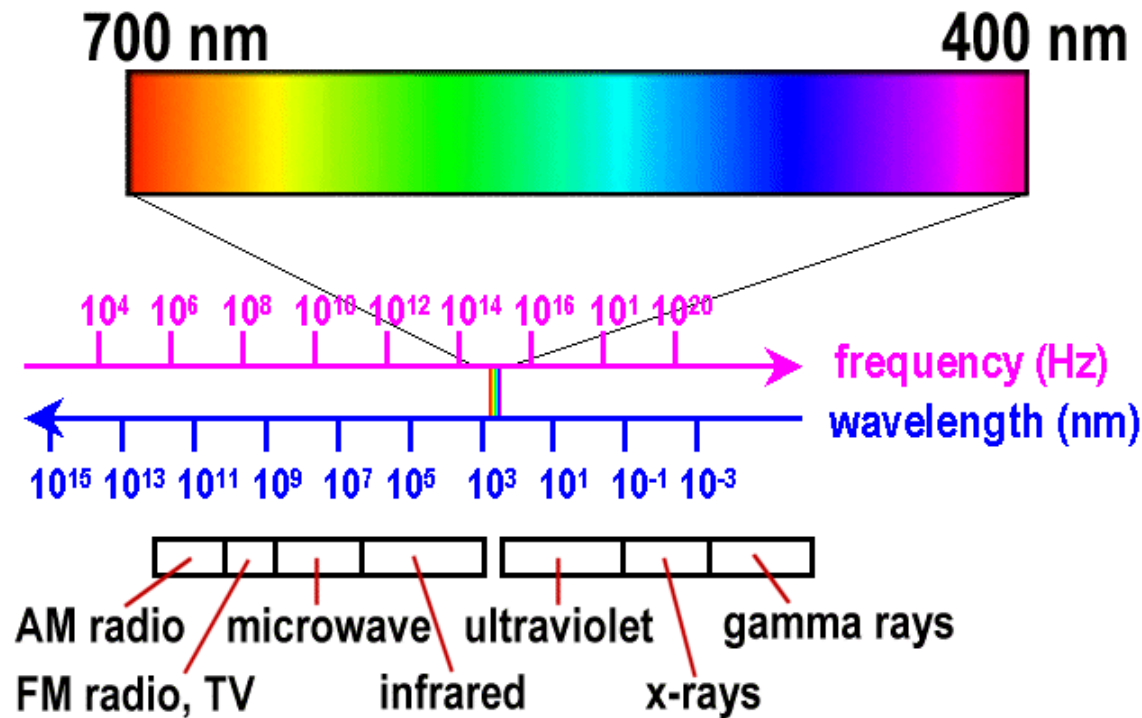




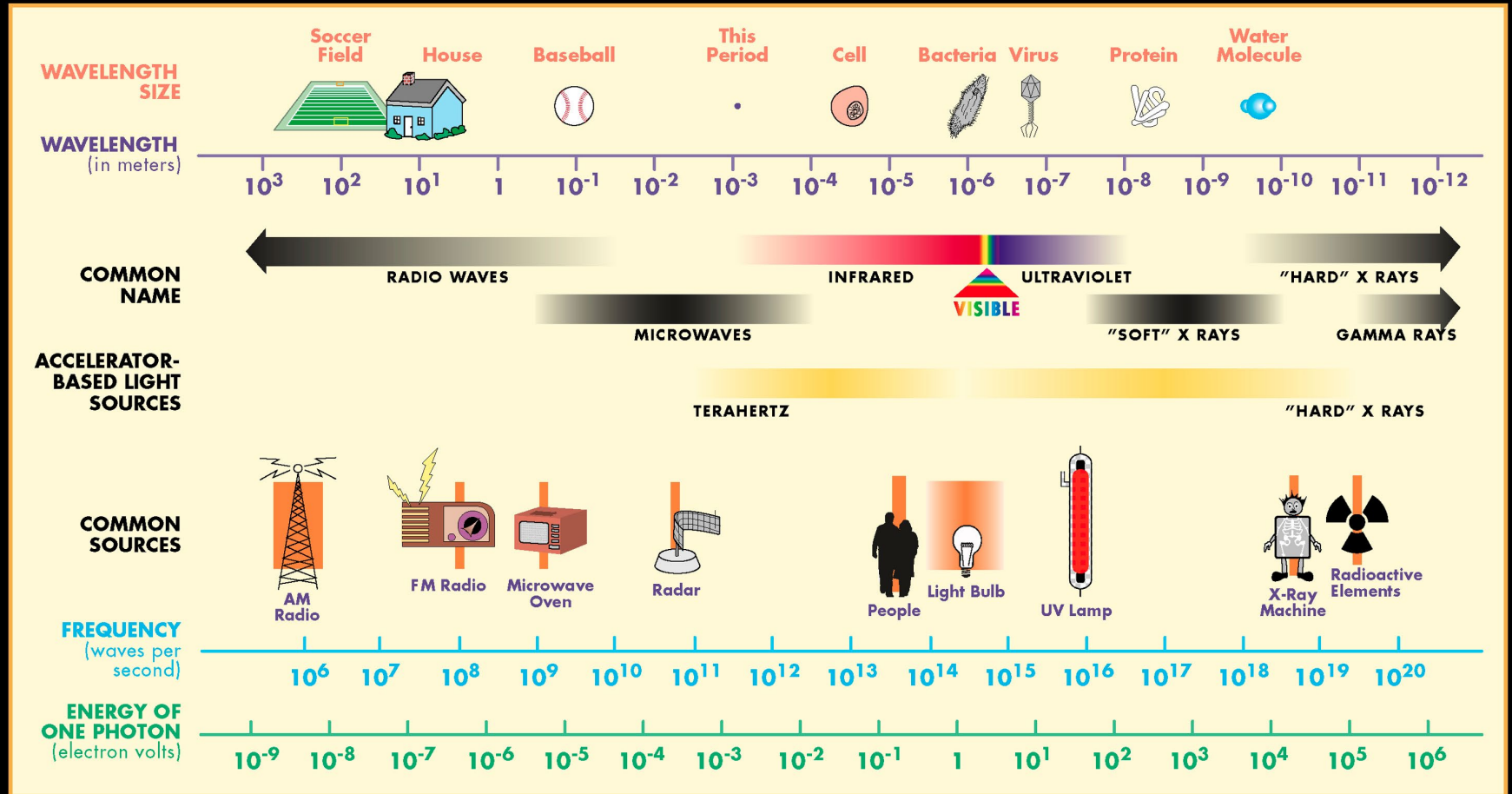
La perception et le système visuel



LE SPECTRE ÉLECTROMAGNÉTIQUE

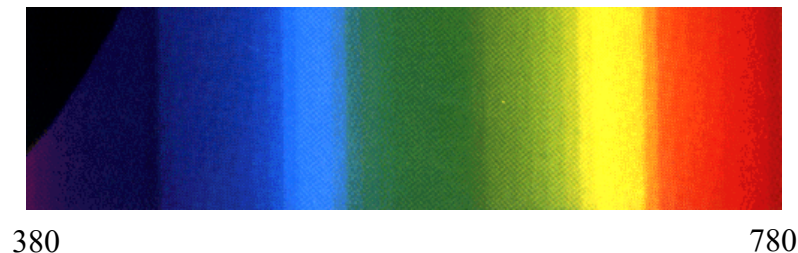


THE ELECTROMAGNETIC SPECTRUM



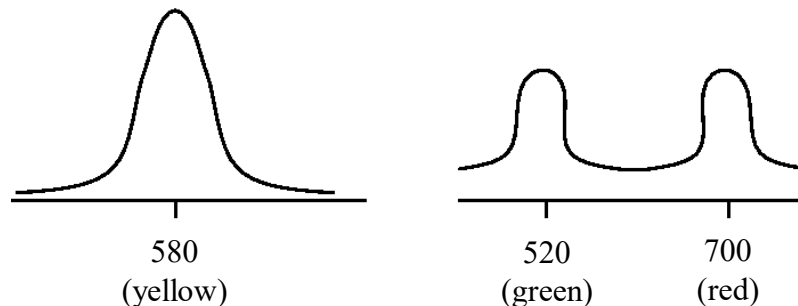
LA COULEUR PHYSIQUE

- L'énergie visible est une petite partie du spectre électromagnétique
- Les couleurs *monochromatiques* pures ont des longueurs d'onde entre 380nm (violet) et 780nm (rouge)



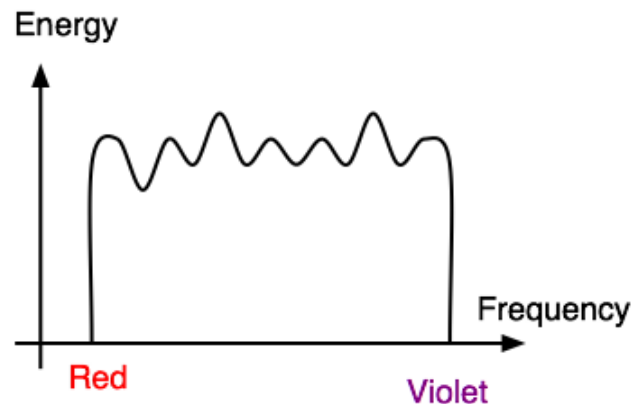
LA COULEUR VISIBLE

- L'œil peut percevoir les couleurs comme une combinaison de quelques couleurs pures
- La plupart des couleurs peuvent être obtenues via un mélange des couleurs *primaires*
- Les dispositifs de sortie utilisent ce fait



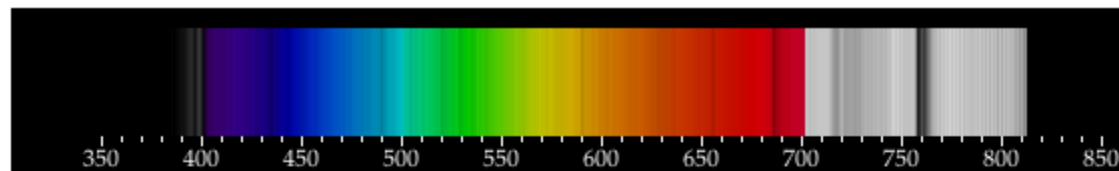
LA LUMIÈRE BLANCHE

Le soleil émet toutes les fréquences dans la gamme visible afin de produire ce qu'on perçoit comme « la lumière blanche »

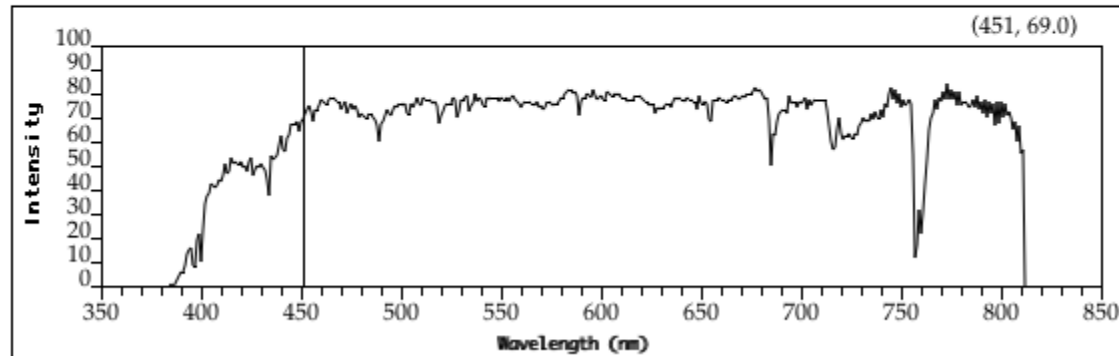


LE SPECTRE SOLAIRE

Une distribution spectrale: la puissance vs.
la longueur d'onde



Emission Graph

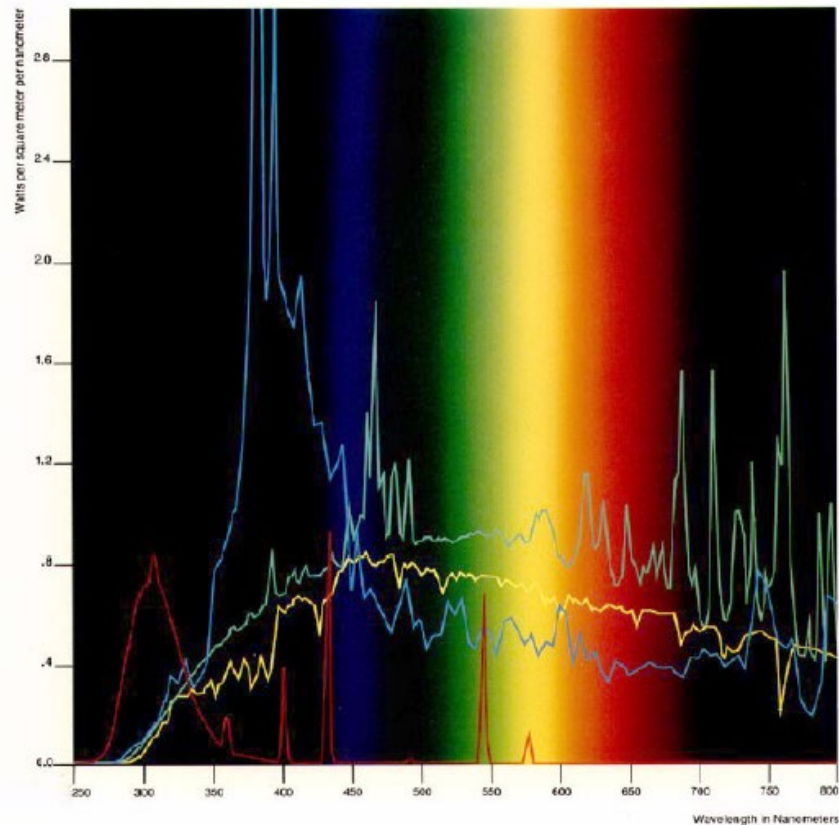


Electromagnetic Spectrum

LE SPECTRE CONTINU

Le soleil Les lumières « du jour »

A Comparison of Relative Spectral Energy Distribution



Sunlight
Marsh "Average Observer" Based Global Radiation,
Measured 6/5/2004

Sunlight Carbon Arc
As used in Auto Weather Center's "Core 3 Filter"

Xenon Arc Lamp
As used in Auto Weather Center's
Q50 that Xenon Lamp with Xenon Arc Lamp and
Color Filter, all in one unit (10 W/100)

FS-40 Fluorescent Sun Lamp
As used in Auto Weather Center's "Core 3 Filter"

Accelerated weathering devices are used to determine the effects of sunlight on various substrates.

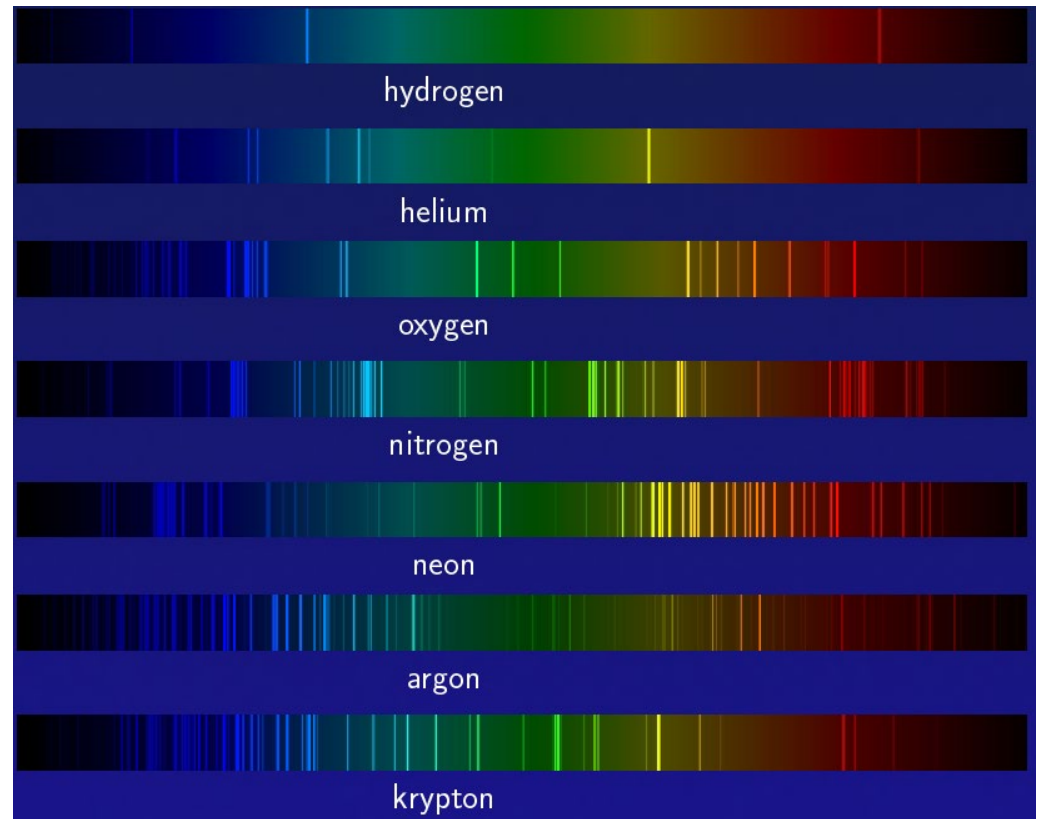
This graph illustrates the spectral energy distribution as a function of the wavelength produced by a number of artificial light sources. The farther left the wavelength appears on the graph (i.e., shorter wavelength), the higher the energy output generated. The graph compares these energy outputs to terrestrial sunlight.

Devices that emit larger amounts of shorter wavelengths cause samples to fail in shorter periods of time, and often correlate less well than those instruments which emit wavelengths closer to the distribution of terrestrial sunlight.

CIBA-GEIGY
Corrosion Protection Division

LE SPECTRE LINÉAIRE

- Les gaz ionisés
- Les lasers
- Quelques lampes fluorescentes



LA PHYSIOLOGIE DE LA VISION

La rétine

- Les bâtonnets

 - Nuances de gris, bords

- Les cônes

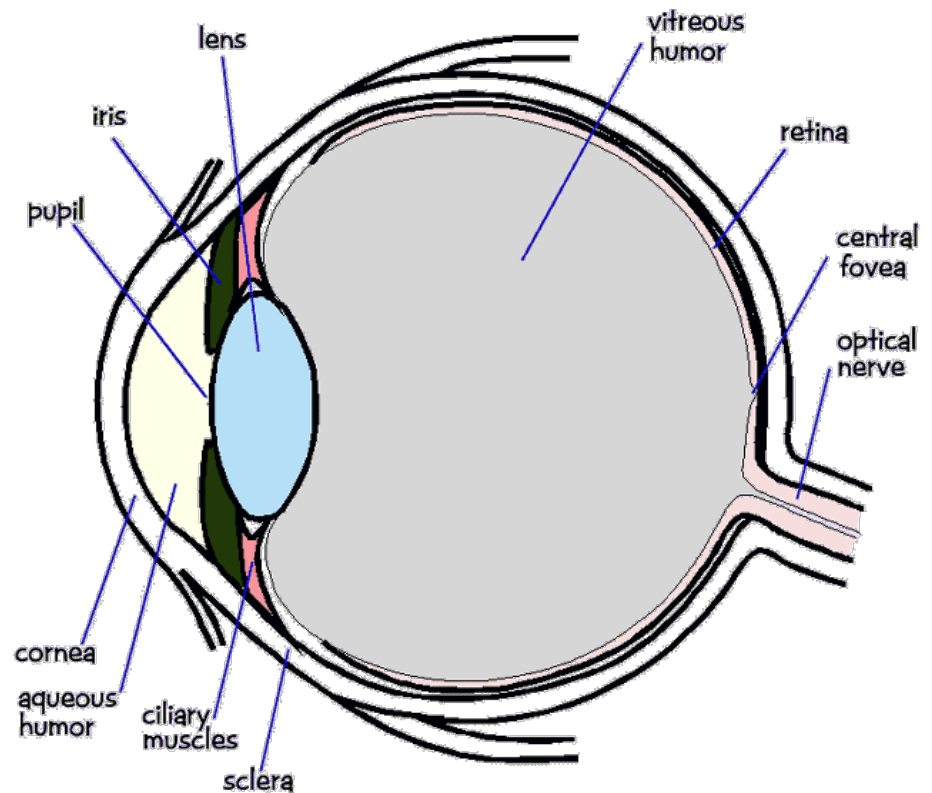
 - 3 types

 - Les senseurs de couleurs

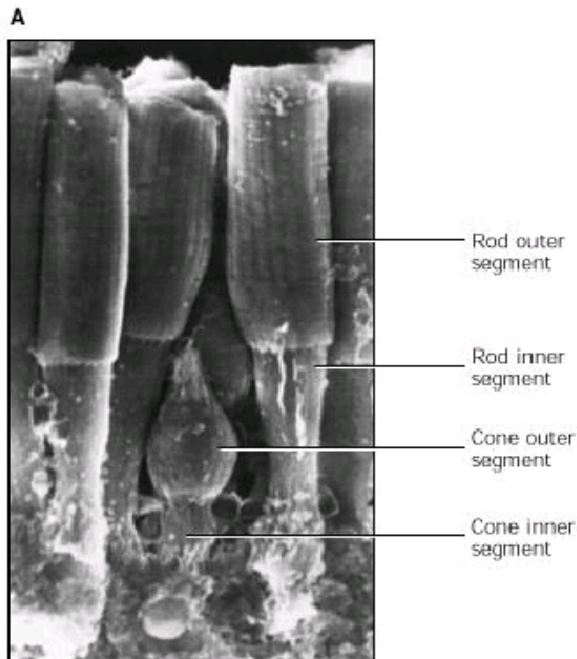
- Une distribution inégale

 - La fovéa est dense

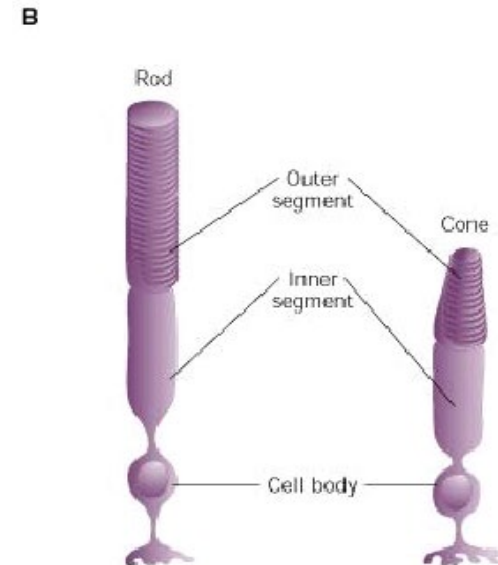
Le nerf optique transmet la lumière
traitée au cortex visuel



LES BÂTONNETS ET LES CÔNES



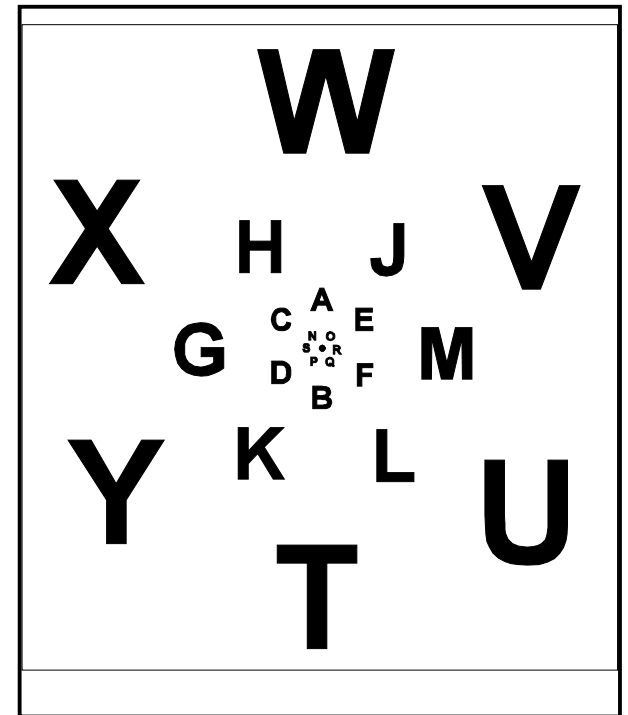
un type,
nuances de gris



trois types,
la couleur

LA VISION FOVÉALE

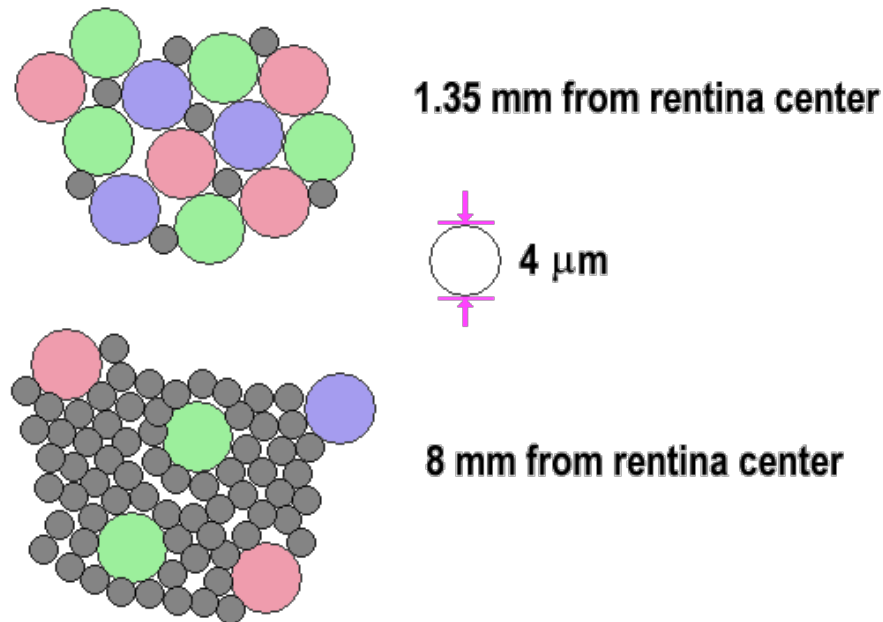
Tenez votre pouce à bout de bras



LA PHYSIOLOGIE DE LA VISION

Le centre dense de la rétine s'appelle
la fovéa

Les cônes y sont plus denses qu'à la *périphérie*



LA THÉORIE TRISTIMULUS DE LA VISION DES COULEURS

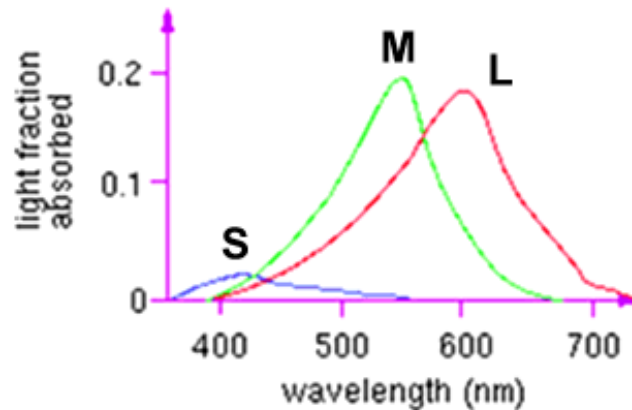
Alors même que les lumières peuvent avoir
un spectre très complexe,

il a été déterminé empiriquement que
les couleurs peuvent être décrits par
3 primaires seulement

LA TRICHROMIE

Trois types de cônes

- L ou R, plus sensible à la lumière rouge (610 nm)
- M ou G, plus sensible à la lumière verte (560 nm)
- S ou B, plus sensible à la lumière bleue (430 nm)



Le daltonisme = type(s) de cônes manque(nt)

VISION PÉRIPHÉRIQUE



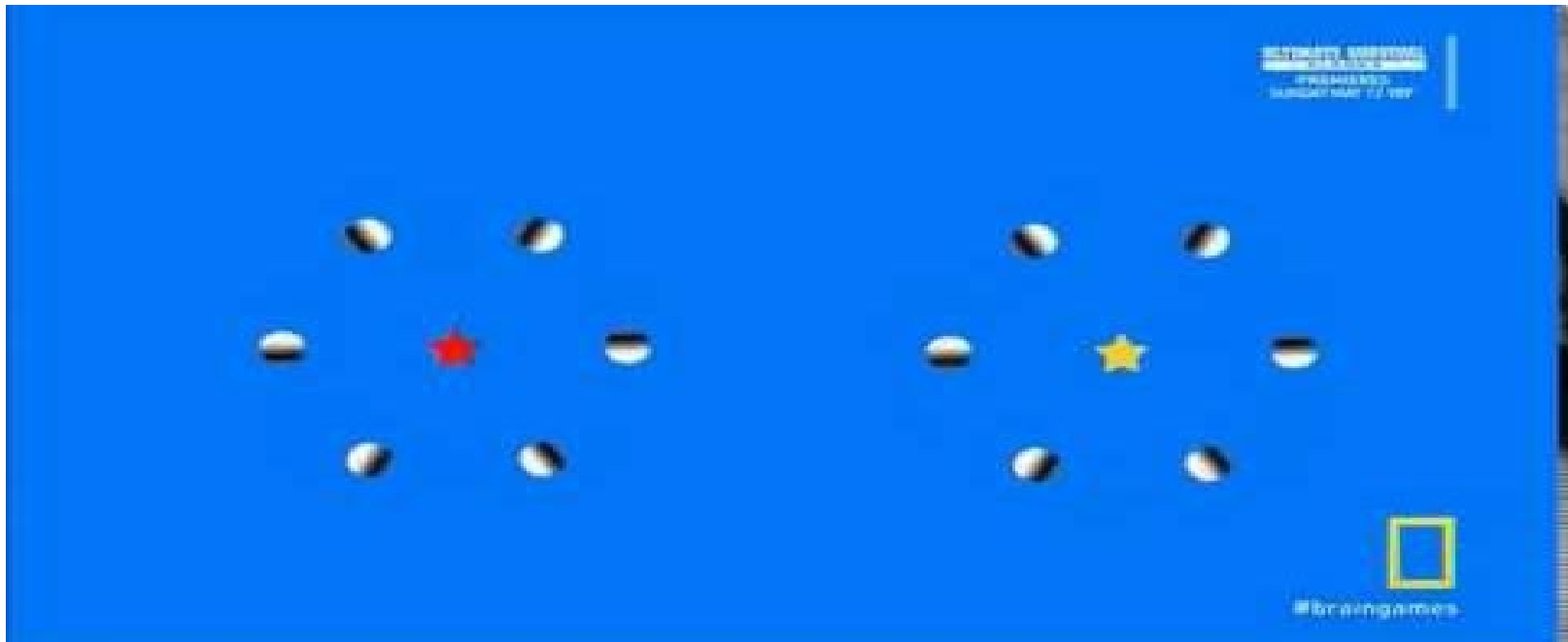
<https://www.youtube.com/watch?v=YJUAtgrpHiY>

VISION PÉRIPHÉRIQUE



<https://www.youtube.com/watch?v=YJUAtgrpHiY>

VISION PÉRIPHÉRIQUE



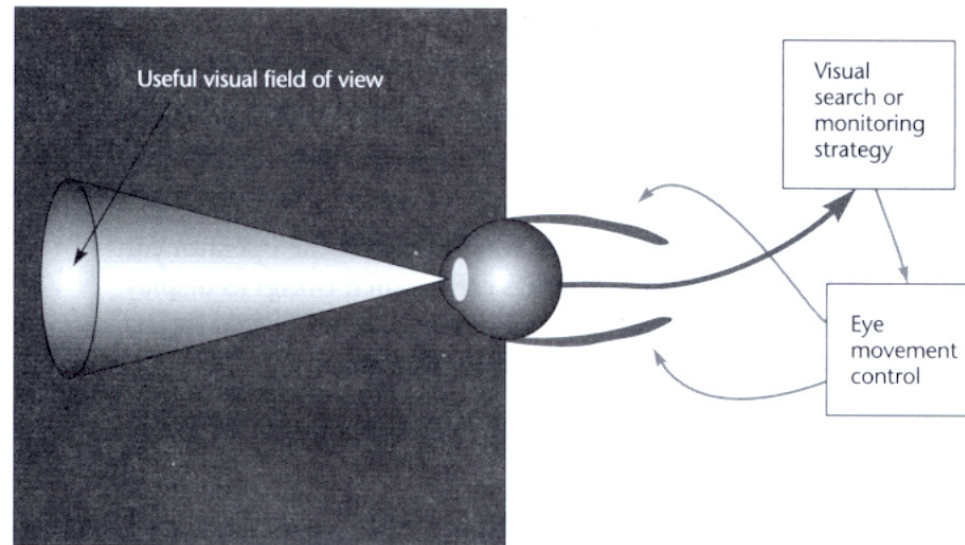
<https://www.youtube.com/watch?v=YJUAtgrpHiY>

CHAMP VISUEL UTILE

Varie avec la tâche (p.e., lecture)

Faible densité de caractères: 15° max.

Haute densité de caractères: $1^\circ - 4^\circ$



MOUVEMENT DES YEUX

*Pour percevoir, nos yeux sont constamment en mouvement...
mais pas de manière continue*

Saccades

- Repositionnement de la fovéa
- Relocalisation balistique du point de fixation
- Durée: 10 - 100 ms (~ 30 ms moyen)
- Vitesse: 400° - 800° par seconde
- Perception très réduite

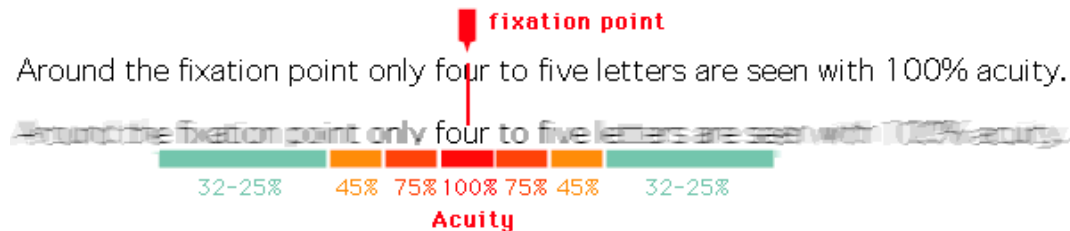
Fixations

- Se reposer sur un point
- Temps entre les saccades
- Durée: 150 ms - 600 ms

Repartition

- 90% fixations, 10% saccades

IMPLICATIONS POUR LA PERCEPTION - LECTURE



fixation ≈ 230 ms, saccade ≈ 30 ms

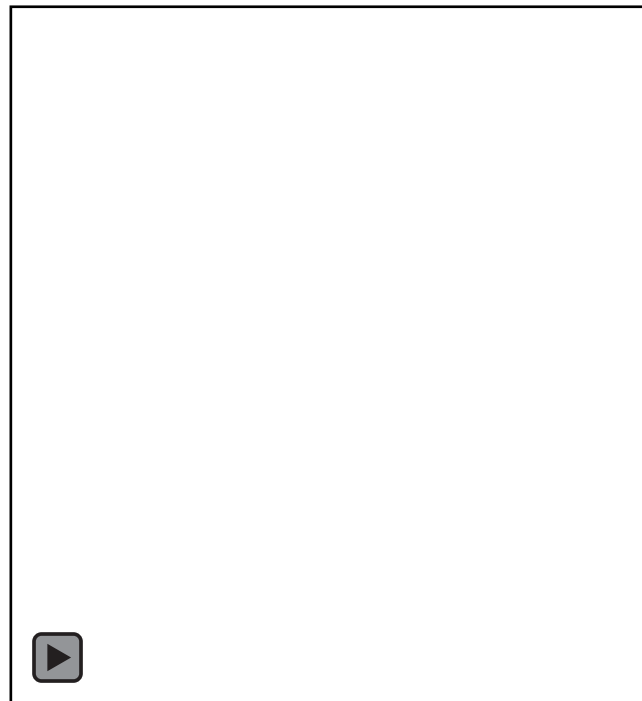
$\rightarrow \approx 250$ ms pour 12 lettres

$$12 \frac{\text{lettres}}{\text{cycle}} \rightarrow 48 \frac{\text{lettres}}{\text{sec}}$$

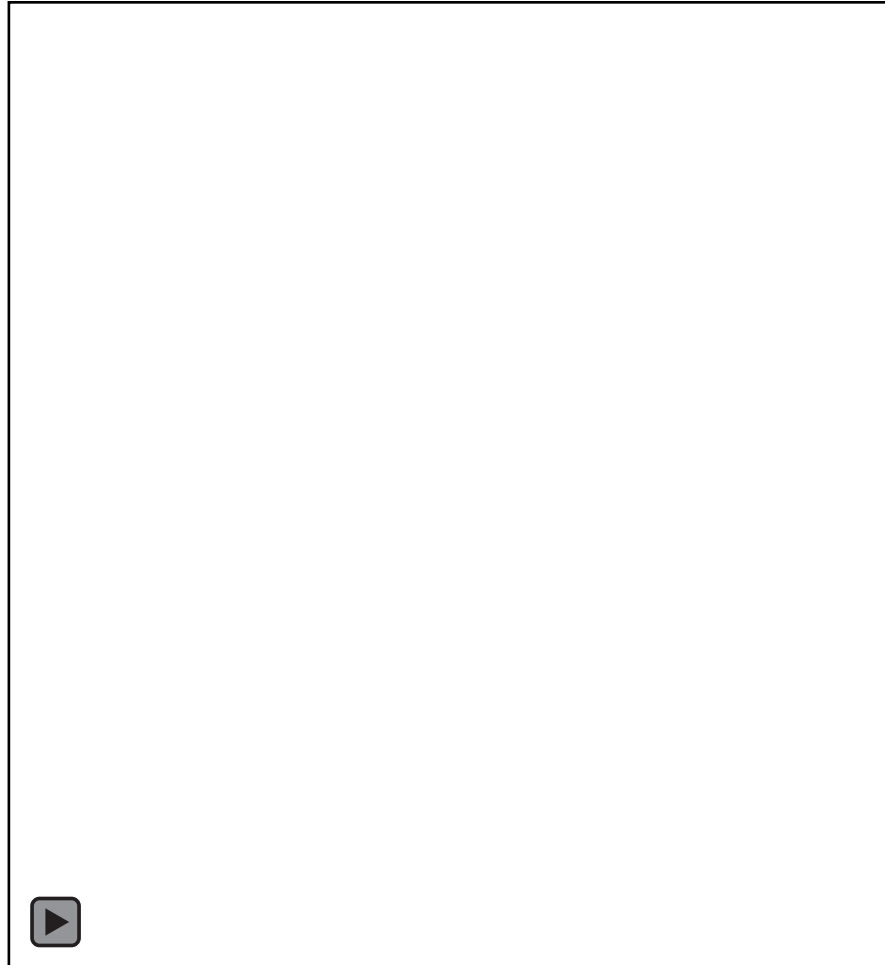
$$5 \frac{\text{lettres}}{\text{mot}} \rightarrow \approx 600 \frac{\text{mots}}{\text{min}}$$

IMPLICATIONS POUR LA PERCEPTION – LECTURE

Exemple: Word Runner d'Amazon



IMPLICATIONS POUR LA PERCEPTION – LECTURE



<https://www.youtube.com/watch?v=w8-WmAexv74>

FIXATIONS ET SACCADES PENDANT LA LECTURE

DANS, KÖN OCH JAGPROJEKT

På jakt efter ungdomars kroppsspråk och den "synkretiska dansen", en sammansmältning av olika kulturers dans, har jag i mitt fältarbete under hösten rört mig på olika arenor inom skolans värld. Nordiska, afrikanska, syd- och östeuropeiska ungdomar gör sina röster hörda genom sång, musik, skrik, skratt och gestaltar känslor och uttryck med hjälp av kroppsspråk och dans.

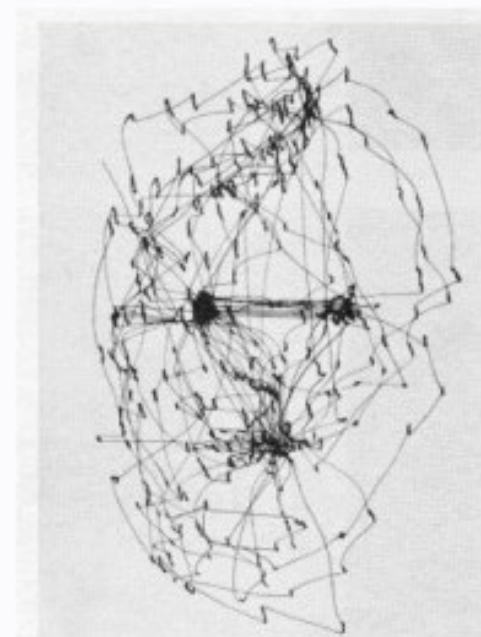
Den individuella estetiken framträder i kläder, frisyrer och symboliska tecken som förstärker ungdomarnas "jagprojekt" där också den egna stilen i kroppsrörelserna spelar en betydande roll i identitetsprövningen. Upphållsrummet fungerar som offentlig arena där ungdomarna spelar upp sina performanceliknande kroppsspråk.

READING

Selon une étude de l'Université de Cambridge, l'ordre des lettres dans un mot n'a pas d'importance, la seule chose importante est que la première et la dernière soit à la bonne place. Le reste peut être dans un désordre total et vous pouvez toujours lire sans problème. C'est parce que le cerveau humain ne lit pas chaque lettre elle-même mais le mot comme un tout.

SACCADES SUR LES VISAGES

Pour les visages: c'est les yeux et la bouche
qui sont les plus importante

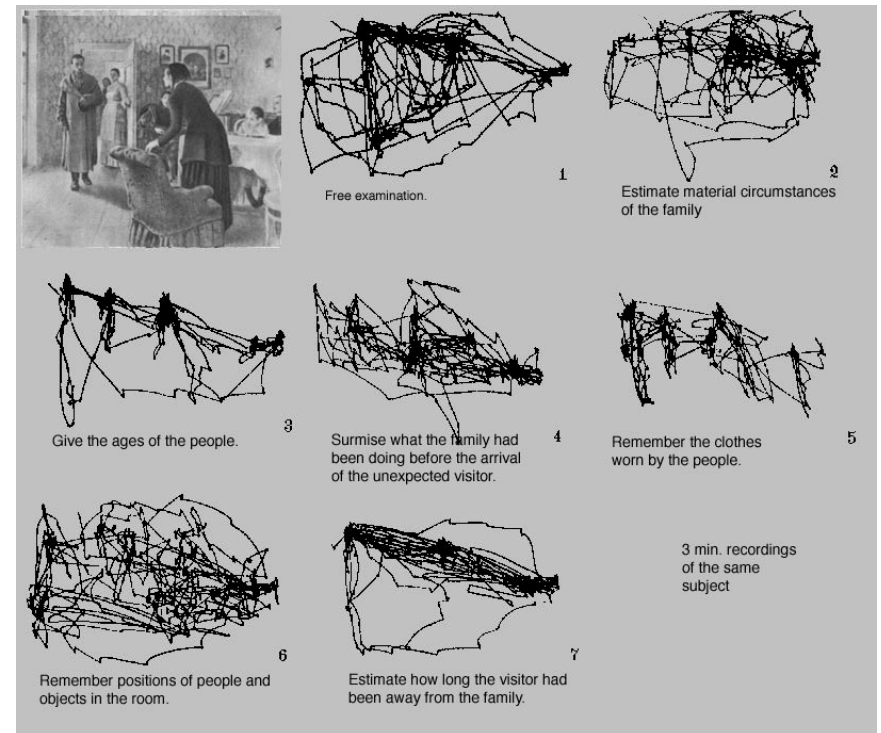
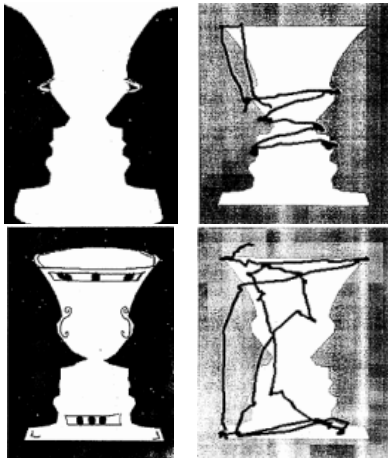


Source: http://www.paed.uni-muenchen.de/~deubel/Motorik/Integrat_web/ppframe.htm

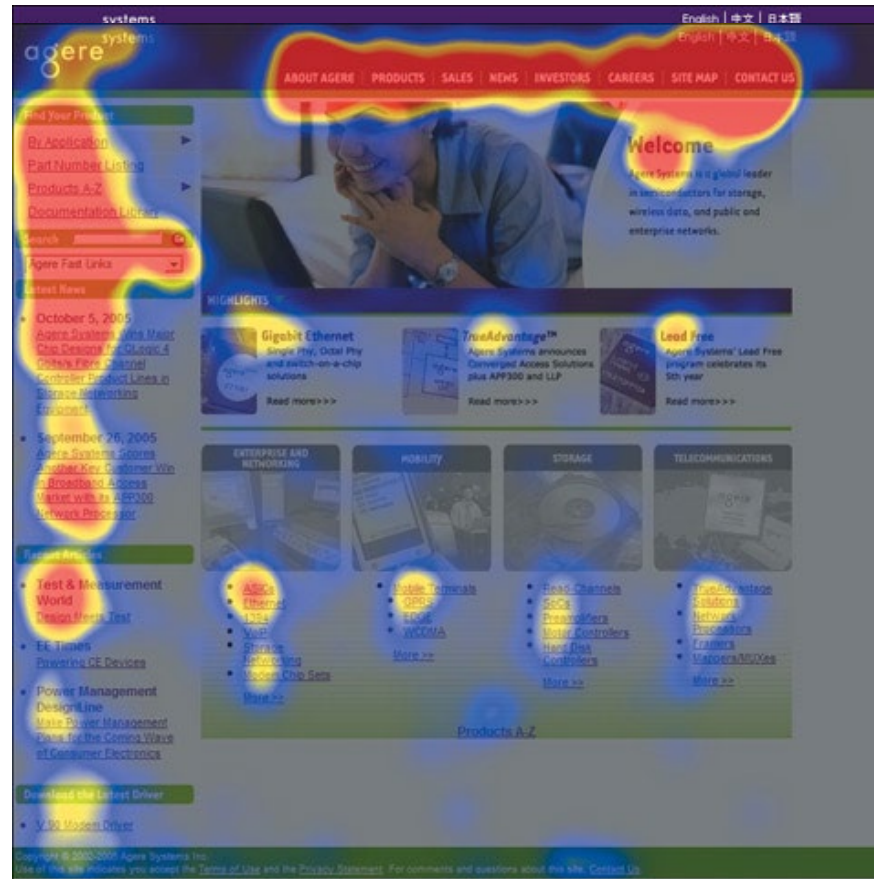
MOUVEMENT DES YEUX

Dépendance du contexte des mouvements du regard:

- Connaissance anticipée
- Etat mentale
- Tâche
- Préd disposition



MOUVEMENT DES YEUX – SITES WEB



[3] Jakob Nielsen; Kara Pernice. Eyetracking Web Usability. New Riders, 2009 ([link](#)).

CONCEPTION TROMPEUSE

The screenshot displays the Skype website's pricing page. A large orange starburst with the word "free" is overlaid on the "Free features" section. Blue arrows with numbers indicate the sequence of user gaze points across the page. The gaze starts at the top right, moves to the "Free features" section, then to the "Paid features" section, and finally to the "Cost features that cost a little" section. The "Free features" section lists: Calling other people on Skype, Video calls on Skype, One-to-one and group chats, Conference calls with up to nine people, and Forwarding calls to other Skype Names. The "Paid features" section includes a price selector set to "United States, Dollars" and "and exclude VAT". It lists: Skype Unlimited - 12 months of unlimited calls to any phone within the US and Canada for just US\$29.95; Calls to international phones at low, per-minute rates; Receive calls from phones with SkypeIn (comes with free Skype Voicemail); Send and receive voicemails; Forward calls to phones at Skype calling rates; and Send SMS messages from Skype from \$ 0,047. The "Cost features that cost a little" section lists: Ringtones (From \$ 1.20), Pictures for your Skype profile (\$ 1.20), Gift certificates (From \$ 25), and Headsets, webcams and more (From \$ 10). A sidebar on the left contains links: Overview, What's free, what's not?, Ways to pay, SkypeOut, SkypeIn, Skype Voicemail, Skype SMS, Skype Prime Beta, Call forwarding, Skype Zones BETA, Accessories guide, Personalise Skype, and Skype Control panel. The top navigation bar includes: Hello there! Sign in, English (Change?), Skype. Take a deep breath, Home, Download, Call phones, Shop, Share, and Help.

What is free and what costs you a little money

Free features

- Calling other people on Skype
- Video calls on Skype
- One-to-one and group chats
- Conference calls with up to nine people
- Forwarding calls to other Skype Names

Paid features

Show prices in and VAT.

Skype Unlimited - 12 months of unlimited calls to any phone within the US and Canada for just US\$29.95. [Get Skype Unlimited](#)

Calls to international phones at low, per-minute rates. [Buy Skype Credit to start calling or view all rates](#)

Receive calls from phones with SkypeIn (comes with free Skype Voicemail). [Buy 3 months - \\$ 12](#)
[Buy 12 months - \\$ 39](#)

Send and receive voicemails. [Buy 3 months - \\$ 6](#)
[Buy 12 months for \\$ 20](#)

Forward calls to phones at Skype calling rates. [Buy Skype Credit](#)

Send SMS messages from Skype from \$ 0,047. [Buy Skype Credit](#)
[See full rates list](#)

Cost features that cost a little

Ringtones	From \$ 1.20
Pictures for your Skype profile	\$ 1.20
Gift certificates	From \$ 25
Headsets, webcams and more	From \$ 10

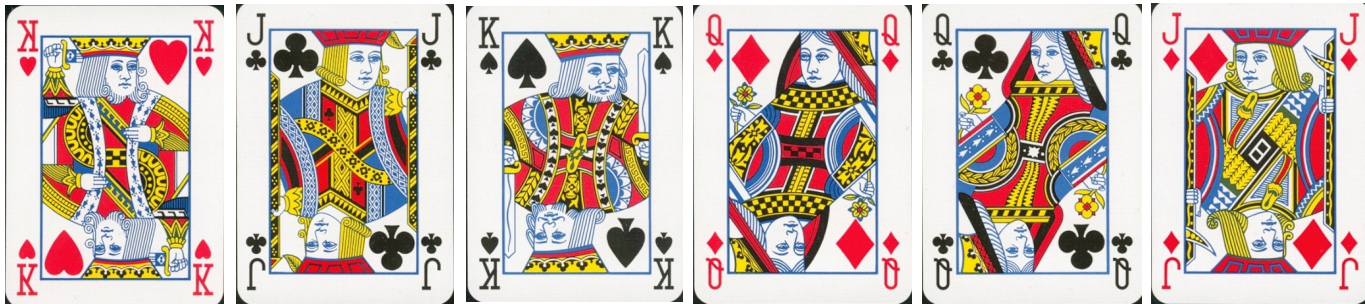
Learn about the different [ways to pay](#).

L'attention



UN TOUR DE MAGIE

Choisissez une carte parmi les six cartes ci-dessous:



Concentrez-vous sur juste cette carte!

UN TOUR DE MAGIE

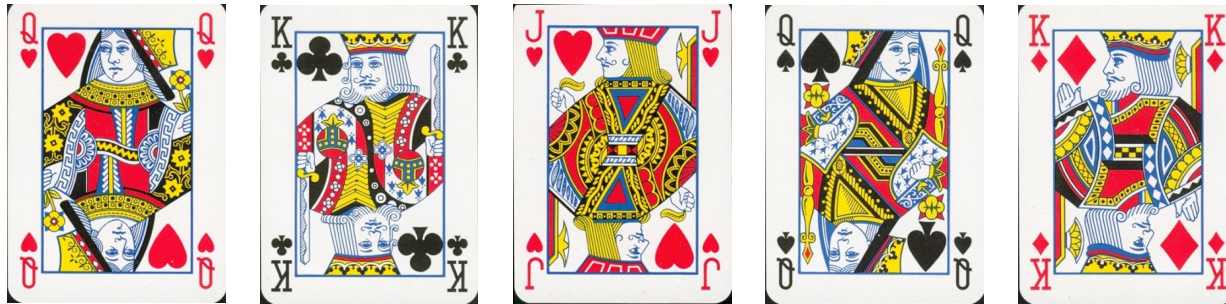
J'ai mélangé les cartes et enlevé celui que
je pense était la votre.



Pouvez-vous encore vous souvenir de
votre carte?

UN TOUR DE MAGIE

Voici les cinq cartes restantes, est-ce que
votre carte est là?

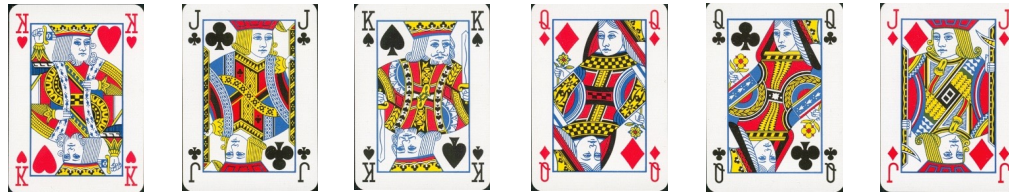


Ai-je deviné juste?
Suis-je un magicien?
Ou est-ce une illusion?

UN TOUR DE MAGIE

Vous venez de vivre la **cécité involontaire**
Aucune des six cartes d'origine n'a été affichée!

Cartes
originales



Cartes
mélangées



CÉCITÉ INATTENTIONNELLE



CÉCITÉ INATTENTIONNELLE



ATTENTION







L'EFFET DE STROOP

bleu

vert

violet

rouge

orange

La réciproque entre la compréhension et la perception

Utilisé comme test (de quoi?)

L'EFFET DE STROOP

зеленый

оранжевый

синий

красный

фиолетовый

La réciproque entre la compréhension et la perception

Utilisé comme test (de quoi?)

ATTENTION VISUELLE – RÉSUMÉ

- Il y a des lacunes remarquables dans notre perception
- L'interprétation humaine du champ visuel est plus restrictive/clairsemée que ne le suggère l'expérience subjective de "voir".
- La perception des objets nécessite des ressources considérables

Une attention est nécessaire pour voir le changement

- Si l'attention est ailleurs, des changements peuvent être manqués

Conduite

Emplacement et planification de la notification dans l'interface utilisateur
Ordinateur portable en classe!