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# INTRODUCTION

*IND8412A - Expérience utilisateur pour le Web*



**POLYTECHNIQUE  
MONTRÉAL**



**1. Présentation et logistique**

**2. Histoire du Web**

**3. éléments du cours**

## **Qui suis-je ?**

- Ingénieur
- Ergonome
- Doctorant en Facteurs Humains en aviation, ma spécialité est la modélisation cognitive

# Ma recherche

## Réalité augmentée

### Paving the way towards a methodology to faithfully assess physical, physiological, and cognitive impacts of Augmented Reality under constrained environments: a Head-Mounted Display use case

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#### ABSTRACT

Devices supporting augmented reality are becoming more and more advanced and increasing attention is being paid to this technology. Due to recent upgrades in technology, the quality of the experience has improved for users, especially the spatial and temporal consistencies of the scene displayed, and scientists' efforts are focused on designing innovative and seamless interaction modalities, especially in the aviation sector. Nevertheless, the level of requirements being remarkably high in such industry, the implementation of this technology raises the question of the impact of its use under constrained environments and how scientific validation of devices can be performed. Therefore, it is needed to implement

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#### KEYWORDS

Methodology, augmented reality, Head Mounted Display, Human factors, Eye-Tracking, physical effects, physiological effects, cognitive effects

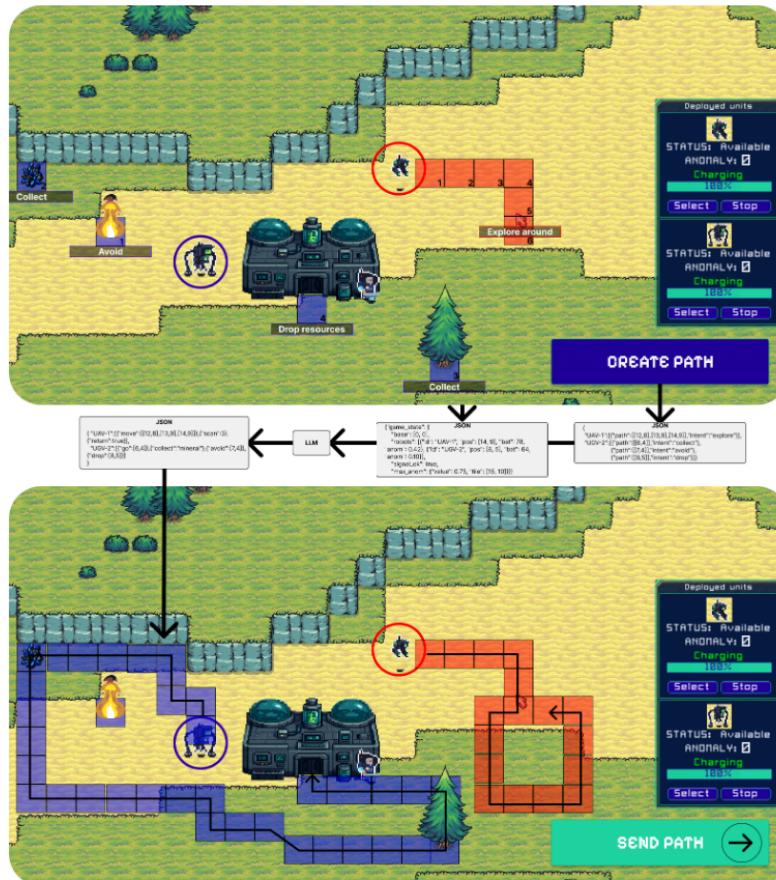
REFERENCES  
Berton, B., Morel-Targosz, C., Chaumillon, R., & Wolff, M. (2023). Paving the way towards a methodology to faithfully assess physical, physiological, and cognitive impacts of Augmented Reality under constrained environments: a Head-Mounted Display use case. In *18ème Conférence en Ergonomie et Informatique Avancée (ErgoIA '23), October 10–13, 2023, Bidart, France*. ACM, New York, NY, USA, 8 pages. <https://doi.org/10.1145/3624323.3624332>



# Sketch-based Path Generation For Robot Control in a Videogame

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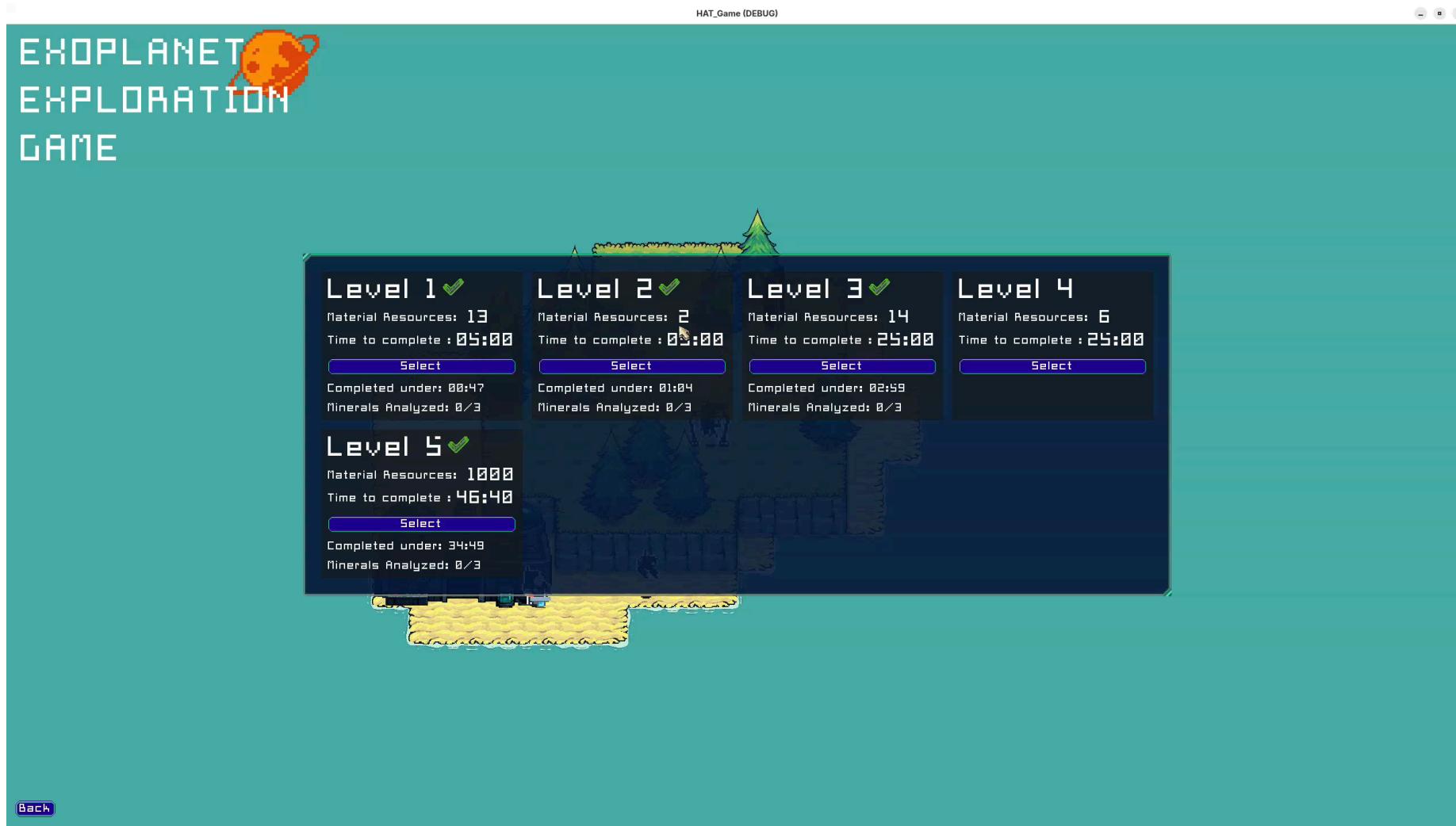
46 Figure 1: Interaction concept in *Exoplanet Explorer*: the player selects a robot, paints a path as tiles, and annotates segments  
 47 with natural language intents (e.g., “explore,” “avoid,” “collect”). An LLM middleware interprets the sketch+labels and compiles  
 48 them into a task and allow to preview and edit the final path before sending it to robots for execution.  
 49

## Abstract

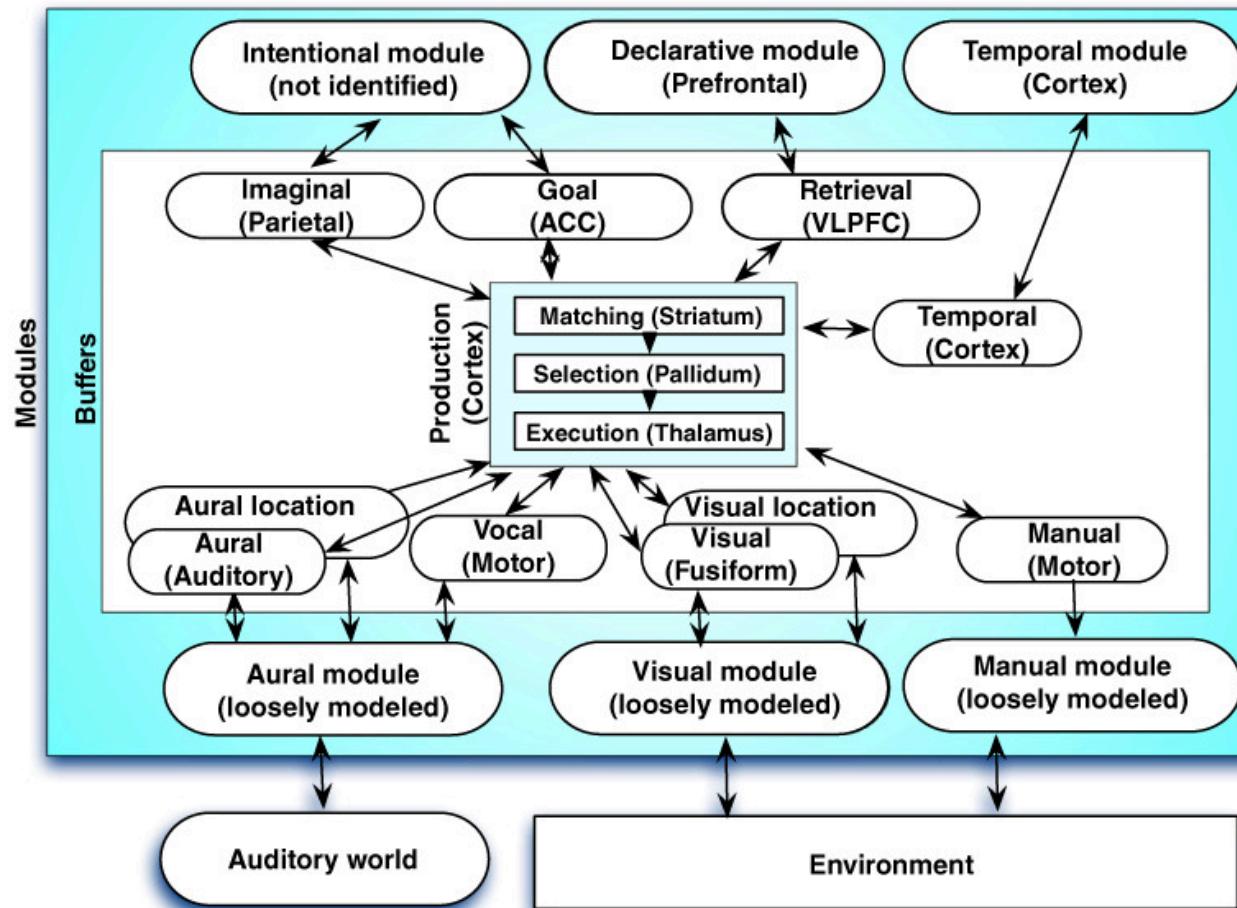
Human–Autonomy Teaming (HAT) requires interfaces that enable humans to express intent at a high level while autonomous agents plan and execute lower-level actions. In our pedagogical

50 Unpublished working draft. Not for distribution.  
 51 Unpublished working draft. Not for distribution.  
 52 Unpublished working draft. Not for distribution.  
 53 Unpublished working draft. Not for distribution.  
 54

## Interaction humain-IA



## Modélisation cognitive



## Modélisation cognitive



## **Qui êtes-vous ?**

- D'où venez vous ?
- A quel programme êtes-vous inscrit ?
- Quel est votre projet professionnel ?
- Pourquoi vous êtes-vous inscrit à ce cours ?
- Que connaissez vous de l'UX ?



---

PLAN DE COURS

Google doc disponible sur Moodle

## **Plan de cours**

1. Introduction et histoire du Web
2. Conception centrée sur l'utilisateur
3. Analyse des besoins et outils de recherche
4. Conception de site web
5. Architecture d'information
6. Théorie de la persuasion
7. Evaluation et tests d'usages
8. Prototypage de sites Web
9. Design et accessibilité
10. Rédaction pour le web



# Objectifs du cours

Quels sont vos attentes pour le cours ?

## Plan de cours

TRAVAIL	PONDÉRATION	TITRE	TYPE	DATE DE REMISE
Rapport 1	10%	Analyse du besoin	Groupe projet	5 février 2026
Rapport 2	25%	Évaluation heuristique	Individuel	19 février 2026
Rapport 3	15%	Définition des exigences	Groupe projet	12 mars 2026
Rapport 4	10%	Maquettage et prototypage	Groupe projet	2 avril 2026
Rapport 5	15%	Test d'usage et synthèse finale	Groupe projet	7 mai 2026
Oral	25%	Présentation orale du projet	Individuel	Au choix

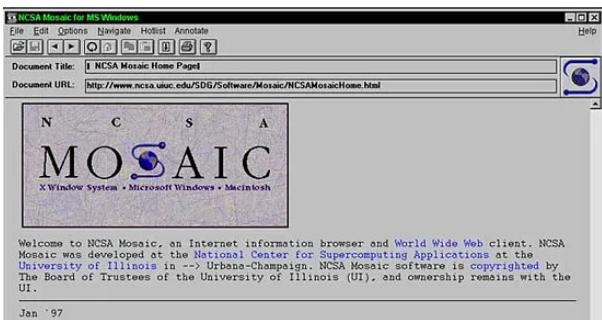


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# L'HISTOIRE DU WEB

*Des origines à nos jours*





orkut

Home Profile Scraps Communities Applications Get this theme

I | Search

Orkut Buyukkokten

[add as friend](#) [ignore](#) [report](#)

location: Mountain View, United States  
view full profile

About Orkut

My goal of life is to try to experience all the wildest things in life (defining "wild" is up to you) and never look back or regret about anything.

Recent videos

Entrevista Mi  
Orkut Parte 2  
[view all videos](#)

Entrevista Mi  
Orkut Parte 1

Orkut Buyukkokten

2 votes  128  
his updates

[profile](#)

scraps 407727

photos 2

videos 2

testimonials

Actions

Add as friend  
Ignore user  
Report abuse

friends (457)

search friends

  
Joe

  
Arpan

  
Bay

  
Leslie

  
Frank

  
Nihil

  
Doug

  
Nina

  
Adam

communities (31)

search communities

  
Yanda Erlich - Nov 14, 2006  
I have these days, I will manage to convince orkut to travel to Brazil with me... they will drown him emperor & I'll finally get my dream job: court jester.

  
ork

What should  
Orkut do?

  
Go

Message

What should  
Google do

PIZZA BUILDER

Build Your Own

Large Hand-Tossed Style Pizza

[View Details](#)

Crust:

Hand-Tossed Style Pizza

Quantity:

1

Size:

Medium

Large

Special Instructions:

Add extra cheese for  
only \$1.69 more!

[GO FOR IT >](#)

Pizza Type

Toppings

Sauce & Cheese

Meat Toppings:

NONE

Pepperoni

Ham

Beef

Italian Sausage

Bacon Pieces

Chicken

Veggies & Fruits:

NONE

Mushrooms

Green Peppers

Onions

Black Olives

Diced Tomatoes

Jalapenos

[« Previous](#)

[Next »](#)

[ORDER THIS PIZZA »](#)

# Archie Query Form

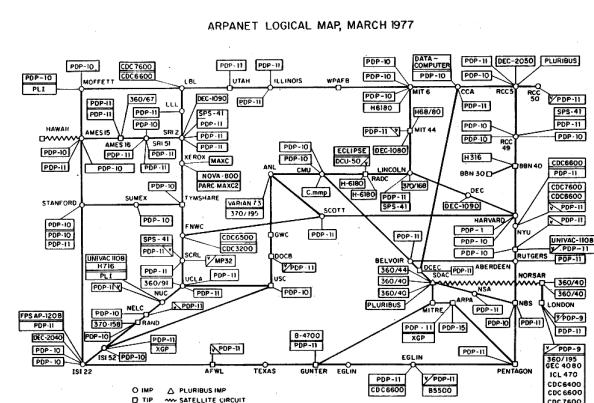


Search for:

**Database:**  Worldwide Anonymous FTP       Polish Web Index  
**Search Type:**  Sub String       Exact       Regular Expression  
**Case:**  Insensitive       Sensitive

Do you want to look up strings only (no sites returned):  
 NO       YES

**Output Format For Web Index Search:**  Keywords Only  
 Excerpts Only  
 Links Only



# World Wide Web

The WorldWideWeb (W3) is a wide-area [hypermedia](#) information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an [executive summary](#) of the project, [Mailing lists](#) , [Policy](#) , November's [W3 news](#) , [Frequently Asked Questions](#) .

## What's out there?

Pointers to the world's online information, [subjects](#) , [W3 servers](#), etc.

## Help

on the browser you are using

## Software Products

A list of W3 project components and their current state. (e.g. [Line Mode](#) ,X11 [Viola](#) , [NeXTStep](#) , [Servers](#) , [Tools](#) , [Mail robot](#) , [Library](#) )

## Technical

Details of protocols, formats, program internals etc

## Bibliography

Paper documentation on W3 and references.

## People

A list of some people involved in the project.

## History

A summary of the history of the project.

## How can I help ?

If you would like to support the web..

## Getting code

Getting the code by [anonymous FTP](#) , etc.



## World Wide Web

The WorldWideWeb (W3) is a wide-area [hypermedia](#) system.

Everything there is online about W3 is linked directly from this page. See the [FAQ](#), [Policy](#), November's [W3 news](#), [Frequently Asked Questions](#).

### What's out there?

Pointers to the world's online information, [Information](#)

### Help

on the browser you are using [Browsers](#)

### Software Products

A list of W3 project components and their [status](#)

### Technical

Details of protocols, formats, program interfaces, etc. [Protocols](#)

### Bibliography

Paper documentation on W3 and references [References](#)

### People

A list of some people involved in the project [People](#)

### History

A summary of the history of the project. [History](#)

### How can I help?

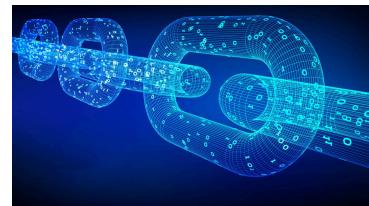
If you would like to support the web.. [Support](#)

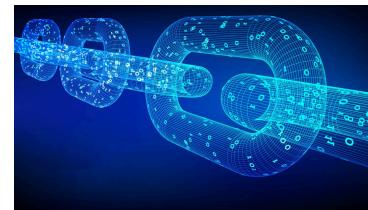
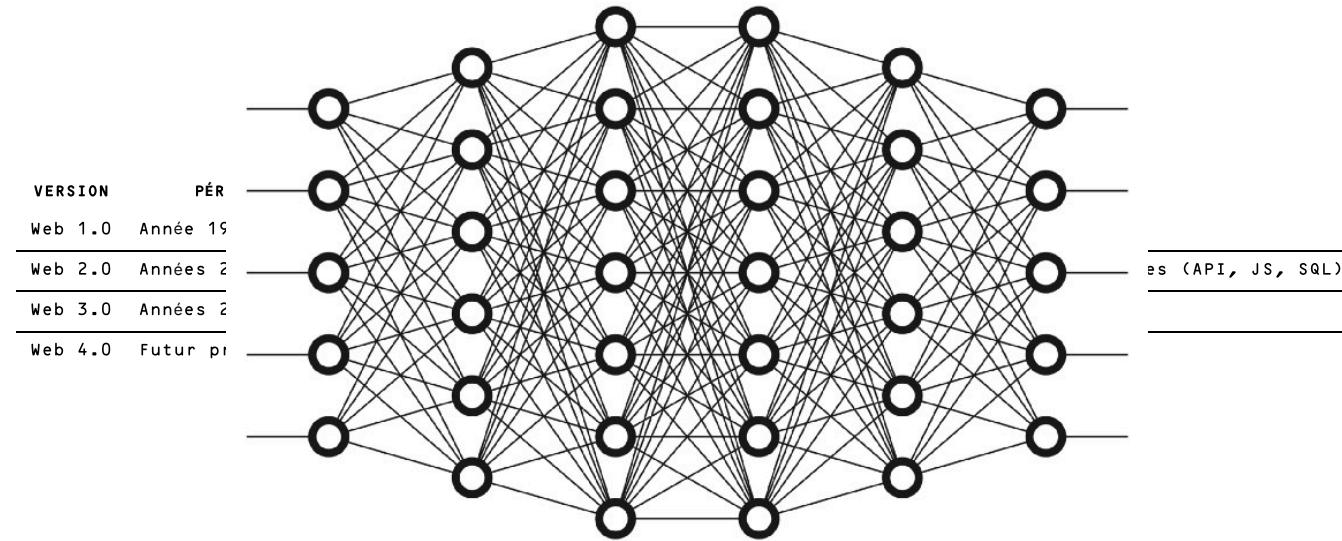
### Getting code

Getting the code by [anonymous FTP](#) , etc. [Code](#)



VERSION	PÉRIODE	CARACTÉRISTIQUE PRINCIPALS
Web 1.0	Année 1990-2000	Statique, lecture seule, peu interactif (HTML, CSS)
Web 2.0	Années 2000-2010	Social, interactif, participatif, centralisé, monétisation des données (API, JS, SQL)
Web 3.0	Années 2020	Sémantique, décentralisé, centrée sur les données (RDF, OWL)
Web 4.0	Futur proche	Intelligent, ubiquitaire, immersif (AR/VR, IoT, BCI)





## Internet VS World Wide Web



## Internet VS World Wide Web



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# L'EXPÉRIENCE UTILISATEUR

*Sur les interfaces Web*



## Le GUI et le début de l'UX

- En novembre 1979 l'équipe d'Apple (S. Jobs) visite le XEROX PARC.
- Des trois techniques présentées (Ethernet, smalltalk et GUI), Jobs retient l'interface graphique.
- Il vient de trouver la pièce manquante : l'OS doit être masqué pour l'utilisateur, via une interface graphique



Xerox Parc • Démonstration de l'interface graphique (1982)



## Amazon (1995)



### Welcome to Amazon.com Books!

*One million titles,  
consistently low prices.*

(If you explore just one thing, make it our personal notification service. We think it's very cool!)

#### SPOTLIGHT! -- AUGUST 16TH

These are the books we love, offered at Amazon.com low prices. The spotlight moves EVERY day so please come often.

#### ONE MILLION TITLES

A quoi res semblaient les sites ?

The screenshot shows the Amazon.ca homepage with a dark header bar. At the top left is the 'amazon.ca' logo and a 'Hello Select your address' dropdown. On the right are language ('EN'), account ('Account & Lists'), returns ('Returns & Orders'), and a shopping cart icon with '0' items. The main navigation menu below includes 'All', 'Best Sellers', 'Deals Store', 'New Releases', 'Customer Service', 'Prime', 'Gift Ideas', 'Electronics', 'Home', 'Books', 'Coupons', 'Sell', 'Gift Cards', and 'Kindle Books'. A large banner on the right says 'New Year, now you'.

**Save up to 30% with Amazon Coupons**

**Today's deals**

Up to 33% off **Top deal**  
TESSAN Power Bars and Surge Protectors

[Shop all deals](#)

**Save with Subscribe & Save**

Cascade Complete Dishwasher Detergent and Tide detergent

[Shop now](#)

**New year, new workout**

Cardio, Yoga, Weights, Pilates

[Shop now](#)

**Ring in the new year with a gift card**

[Shop gift cards](#)

**HAPPY NEW YEAR**

**prime video**  
TOM CLANCY'S **JACK RYAN**  
**WATCH NOW**

**Men's fashion**

**Shop easy smart home updates**

**Shop our Home décor store**

**Save big with coupons**

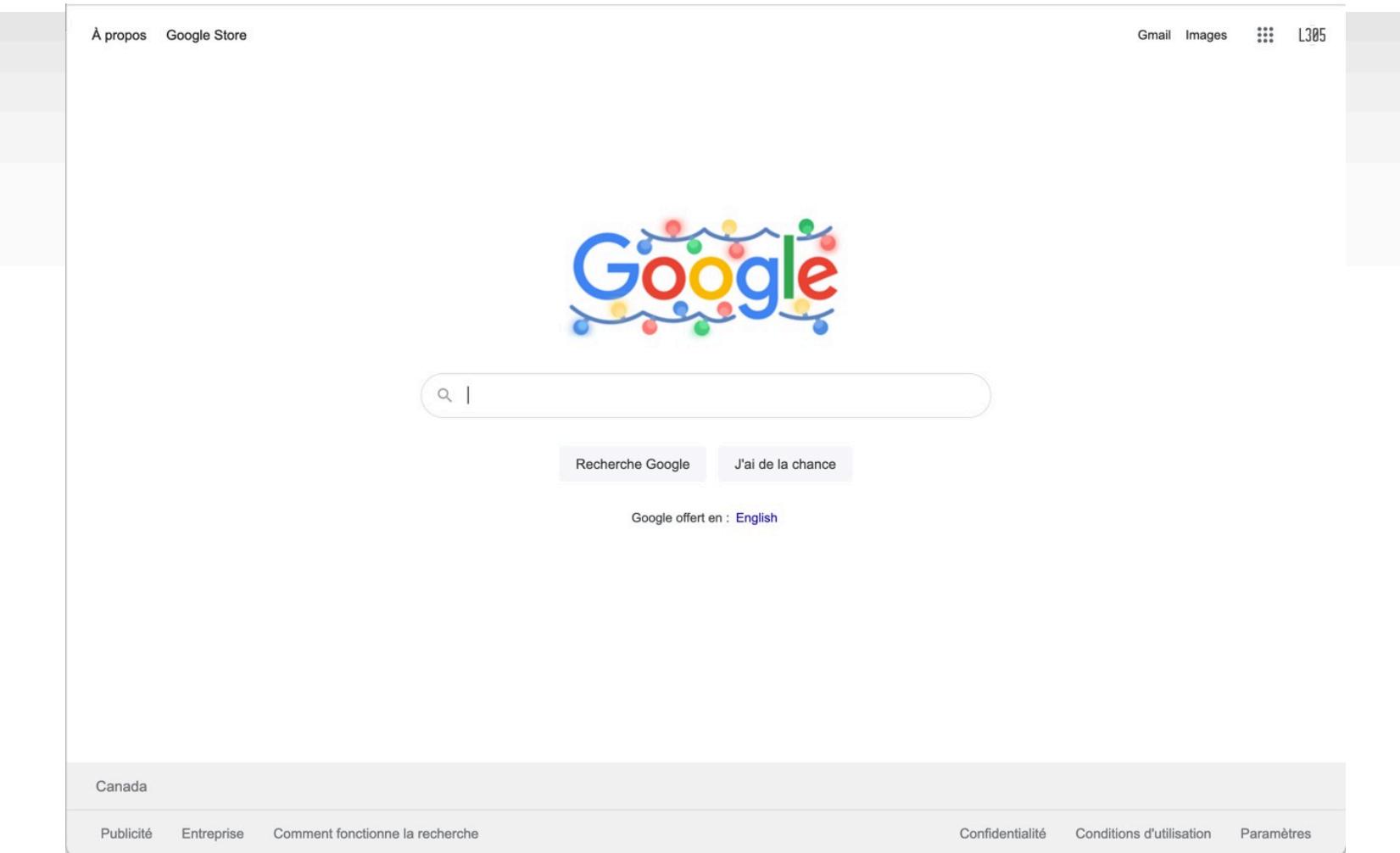
A quoi ressemblaient les sites ?

## Google (1996)



Source : [Telegraph - How 20 popular websites looked when they launched](#)

## A quoi ressemblaient les sites ?



Source : [Telegraph - How 20 popular websites looked when they launched](#)

A quoi ressemblaient les sites ?



Source : Telegraph - How 20 popular websites looked when they launched

A quoi ressemblaient les sites ?

The screenshot shows the Yahoo homepage from 2010. At the top, the Yahoo logo is displayed in its signature purple color. A search bar is positioned next to it, along with a blue search button and user account links for "Sign in", a bell icon for notifications, and an envelope icon for "Mail". Below the header, a navigation menu includes "Mail", "COVID-19", "Boxing Day Deals", "News", "Finance", "Sports", "Lifestyle", "Entertainment", and "More...". A prominent yellow banner spans the width of the page, advertising the "Boxing Day Sale" with the "BEST BUY" logo. A "Shop Now" button is located on the right side of the banner. To the right of the banner, there's a decorative graphic of blue snowflakes. Below the banner, a large photograph shows two people walking down a street decorated with Christmas lights. To the right of the photo, a news article headline reads: "'Isn't this ludicrous?': Canada smashes troubling COVID record". It includes a paragraph about daily COVID-19 cases in Canada and a link to "Experts weigh in". On the far right, a "Trending Now" sidebar lists ten topics, each accompanied by a small thumbnail image. The topics are: 1. COVID Québec, 2. Desmond Tutu, 3. Stock Trading, 4. Dont Look Up, 5. Green Bay Packers, 6. Huma Abedin, 7. Zapier, 8. Queen Elizabeth II, 9. Biohazard Cleaning C..., and 10. Toronto Maple Leafs. At the bottom of the page, there are several smaller news snippets with accompanying images and headlines, such as "Amazon's epic Boxing Day sale is on now: Best deals", "40 Boxing Day deals you won't want to miss out on", "Man finds bargain of his life in Whitehorse thrift store", "Parents of actor Alicia Witt found dead in their home", and "Server blasts low tipping customer". The overall design is characteristic of early web design from the mid-2000s.

Source : Telegraph - How 20 popular websites looked when they launched



## eBay - aka Auction Web (1997)

Auction Web

[Menu] [Listings] [Buyers] [Sellers] [Search] [Contact/Help] [Site Map]

Welcome to today's online  
marketplace...

...the market that brings  
buyers and sellers together  
in an honest and open  
environment...

Welcome to our community. I'm glad you found us.  
AuctionWeb is dedicated to bringing together buyers and  
sellers in an honest and open marketplace. Here, thanks to our  
auction format, merchandise will always fetch its market value.  
And there are plenty of great deals to be found!

Take a look at the listings. There are always several  
hundred auctions underway, so you're bound to find  
something interesting.

If you don't find what you like, take a look at our **Personal  
Shopper**. It can help you search all the listings. Or, it can  
keep an eye on new items as they are posted and let you  
know when something you want appears. If you want to let

## A quoi res semblaient les sites ?

Bonjour! [Ouvrir une session](#) ou [S'inscrire](#)   [Aubaines eBay](#)   [Nous joindre](#)

[Français](#)   [Vendre](#)   [Liste Objets à suivre](#)   [Mon eBay](#)     

**eBay** Magasiner par catégorie      [Toutes les catég...](#)   [Rechercher](#)   [Recherche approfondie](#)

Accueil    Favoris   Mode   Auto-Moto   Électronique   Sports & loisirs   Jeux et jouets   Maison & jardin   Objets de collection   Affaires et industrie   Remis à neuf   Aubaines

**Les meilleures aubaines sont ici, c'est garanti!**

Meilleur prix garanti sur l'électronique, la mode et les articles pour la maison

[Magasiner →](#)



**Aubaines du jour**   [Tout afficher →](#)

 399,00 \$C	 409,97 \$C	 34,99 \$C 80,00 \$C · 56 % de rabais	 119,95 \$C	 1 019,00 \$C	 201,44 \$C
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Acheter   Vendre   Restez informé   À Propos D'eBay   Nous joindre

[En attente de level3-static.ebaycdn.net...](#)

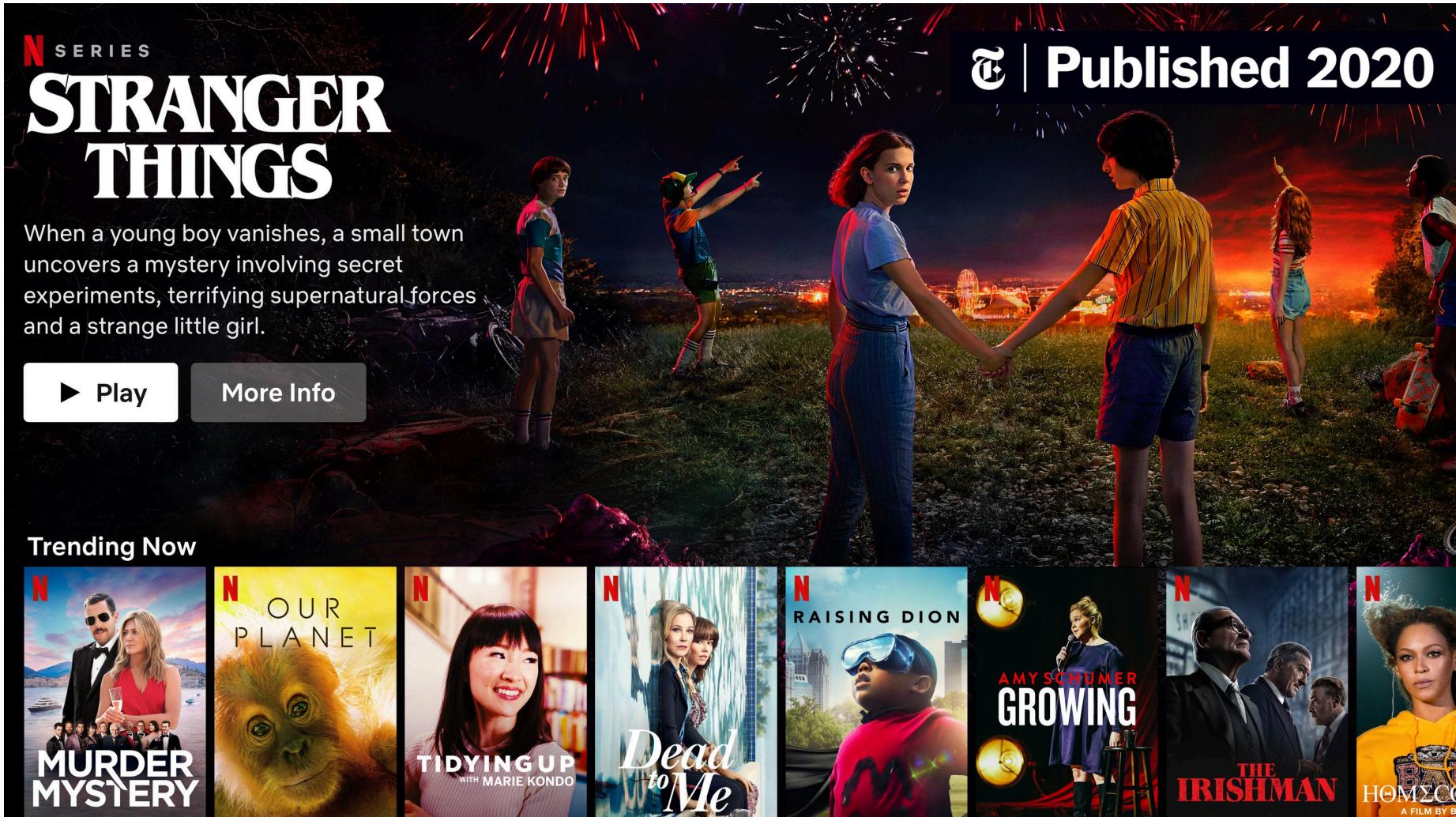
A quoi ressemblaient les sites ?

## Netflix (1997)



Source : [Telegraph - How 20 popular websites looked when they launched](#)

A quoi ressemblaient les sites ?



Source : [Telegraph - How 20 popular websites looked when they launched](#)

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# **ERGONOMIE COGNITIVE ET UX**



**Mais tout d'abord: est-ce vraiment utile ?**

Voyez par vous mêmes : [userinyerface.com](http://userinyerface.com)



<https://www.csfieldguide.org.nz/en/interactives/fitts-law/>

# L'ergonomie cognitive

Les grands thèmes de l'ergonomie cognitive sont :

- La perception
- La mémoire
- La prise de décision
- La performance motrice
- La charge mentale
- La vigilance
- La conscience de la situation
- Les modèles mentaux
- Le stress

## **L'utilisabilité : Une notion centrale en UX**

C'est la mesure du degré de facilité avec laquelle un utilisateur accomplit une tâche donnée.

Souvent exprimé selon 3 grandes dimensions:

- le produit permet à ses utilisateurs d'atteindre le résultat prévu
- atteint le résultat avec un effort moindre ou requiert un temps minimal
- confort et évaluation subjective de l'interaction pour l'utilisateur

## **Le paradoxe en UX**

Simplifier les choses est une tâches **difficile**

- Tout le monde utilise des produits numériques
- La plupart des gens pensent savoir comment les améliorer (c'est du bon sens)
- Un bon design requiert de l'expertise dans de **nombreux**

## **Perception visuelle**

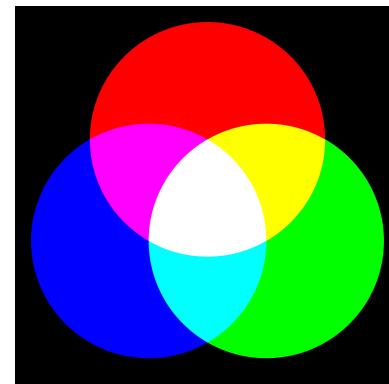
C'est par le sens de la vue que nous percevons:

- La lumière
- Les formes
- Les couleurs

Et que nous distinguons :

- Les détails des objets
- Leur distance
- Leur relief

C'est le sens le plus utilisé lors de l'interaction humain-ordinateur



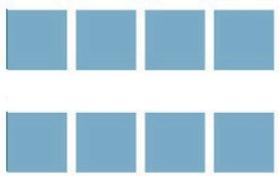
## **Perception visuelle: Les lois de la Gestalt**

Le mot allemand Gestalt est traduit par « forme »

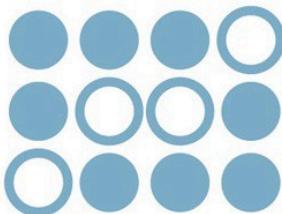
Ce sont des principes de la perception.

Devant la complexité de notre environnement, le cerveau va chercher à mettre en forme, à donner une structure signifiante à ce qu'il perçoit, afin de le simplifier et de l'organiser.

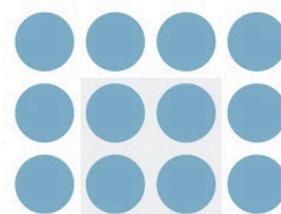
**Proximity**



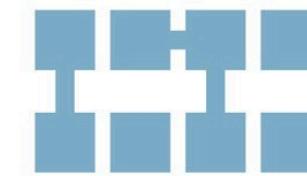
**Similarity**



**Enclosure**



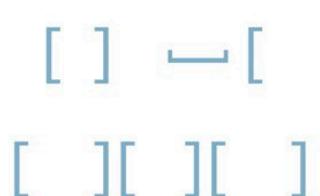
**Connection**



**Continuity**



**Symmetry**



**Figure & Ground**

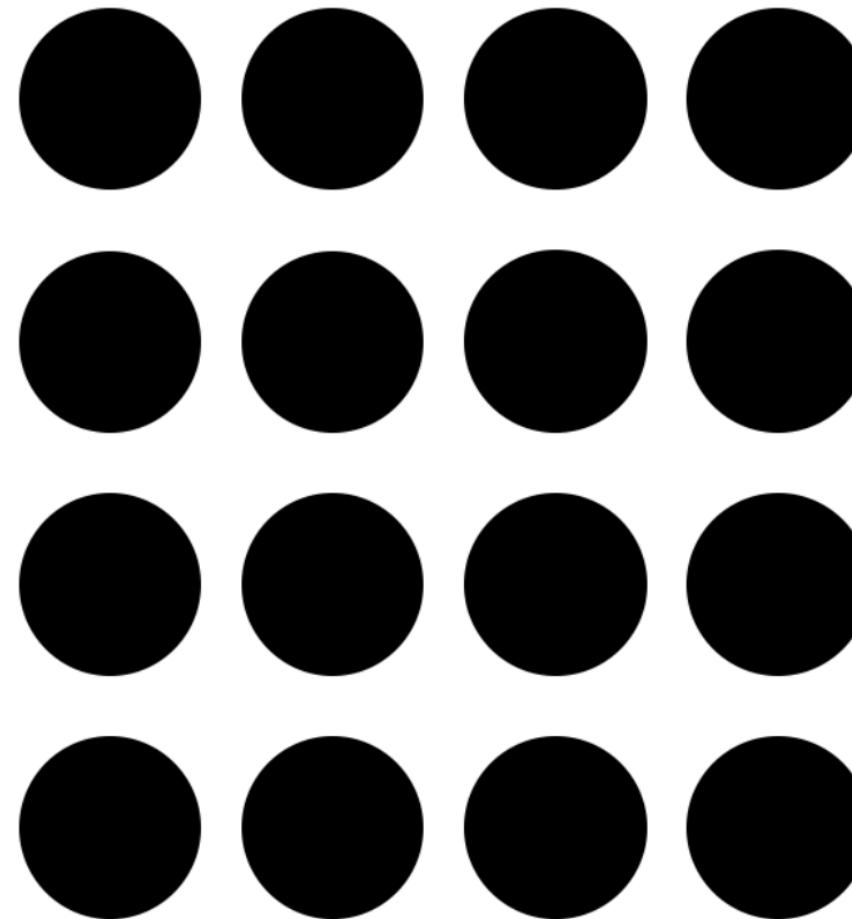


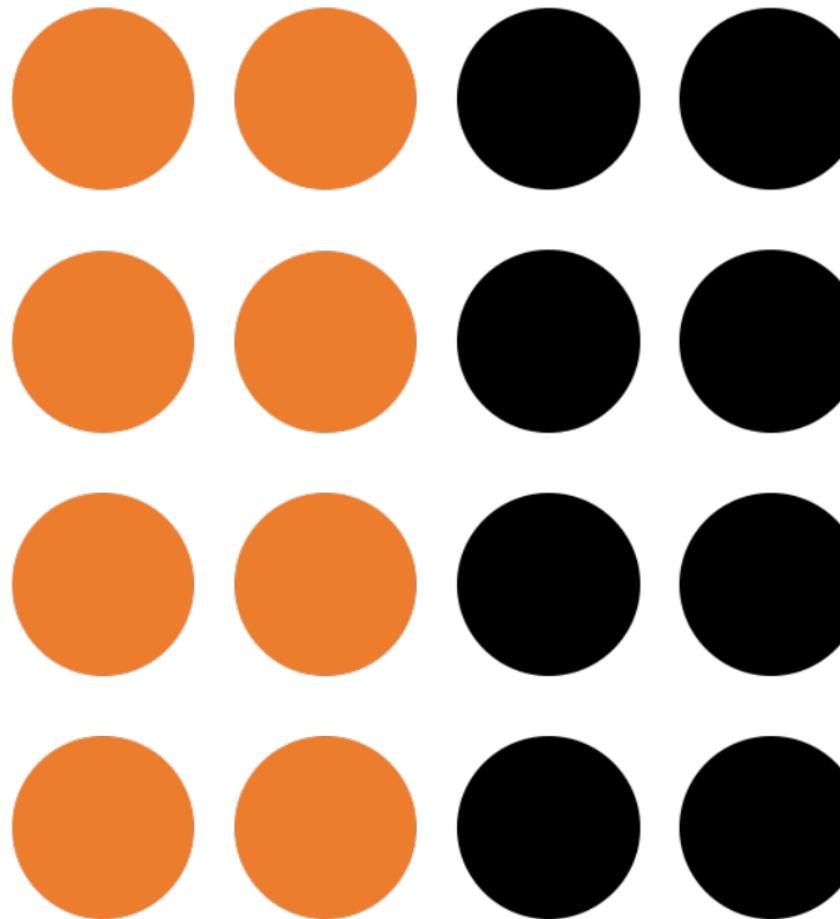
**Closure**

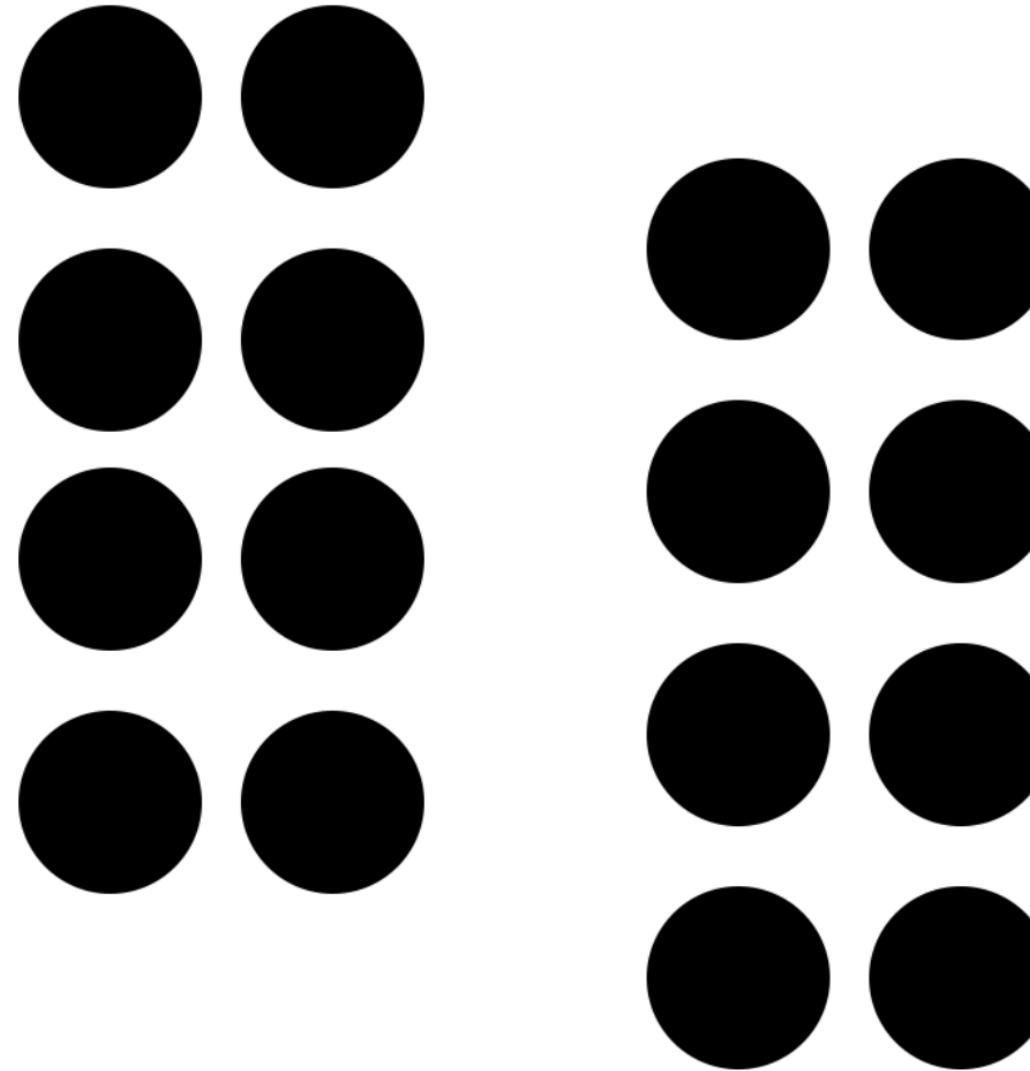


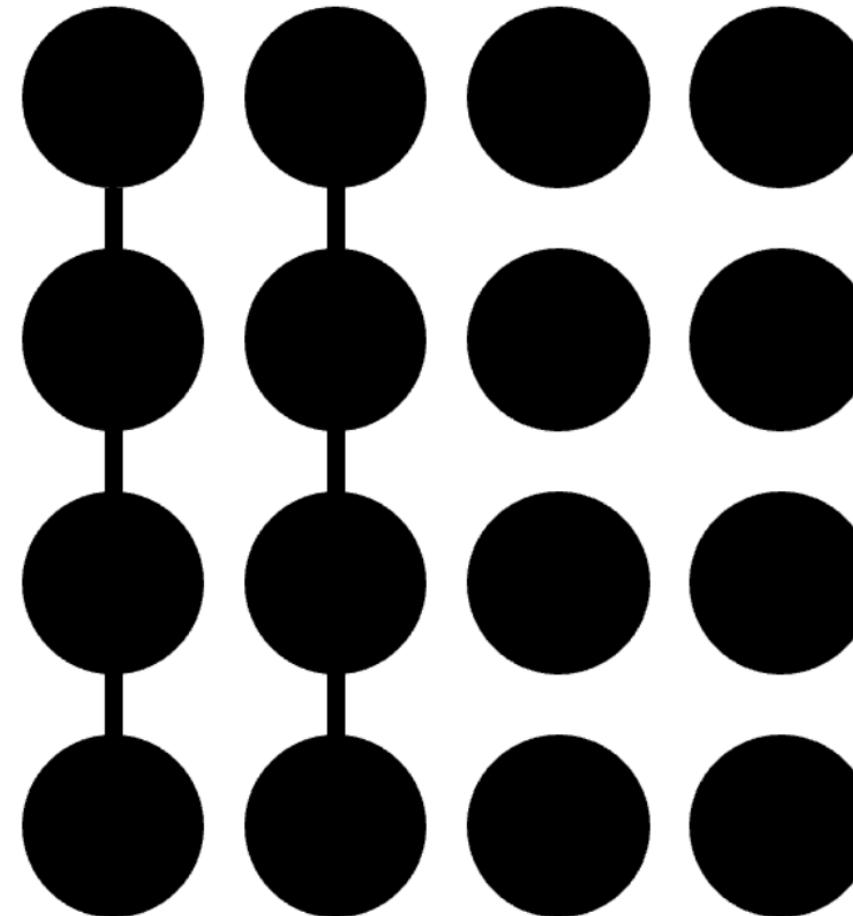
**Common Fate**

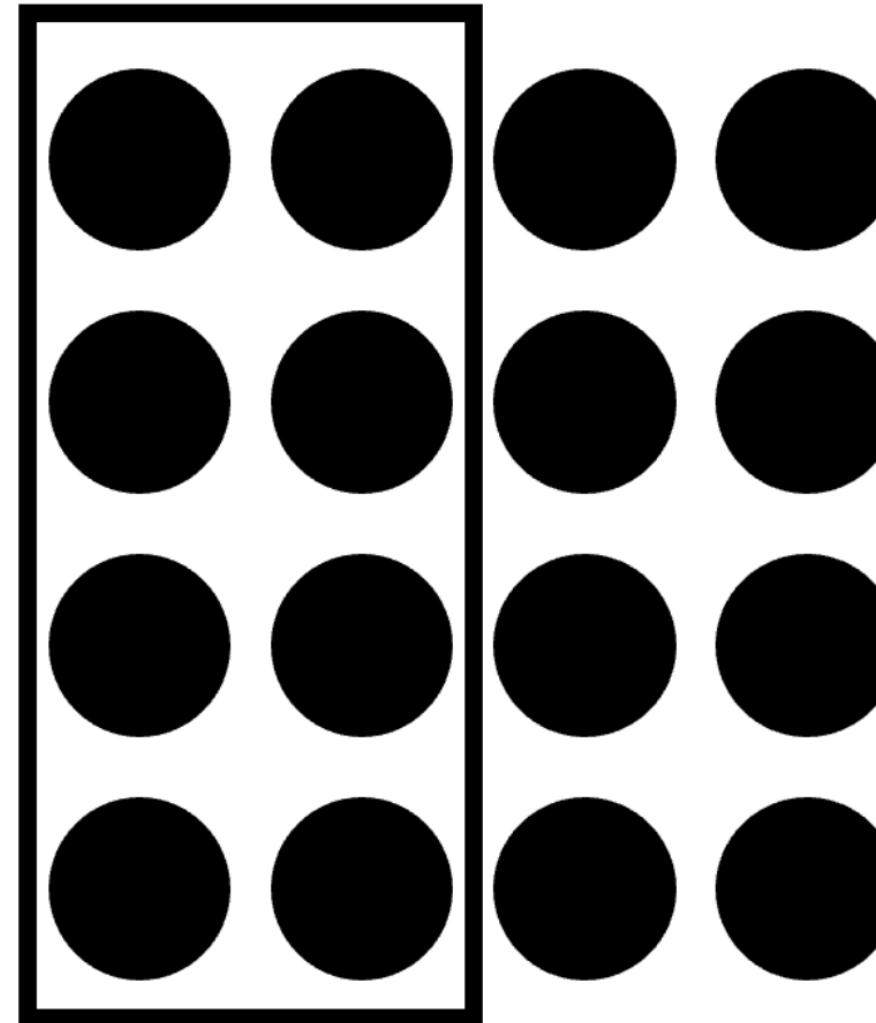


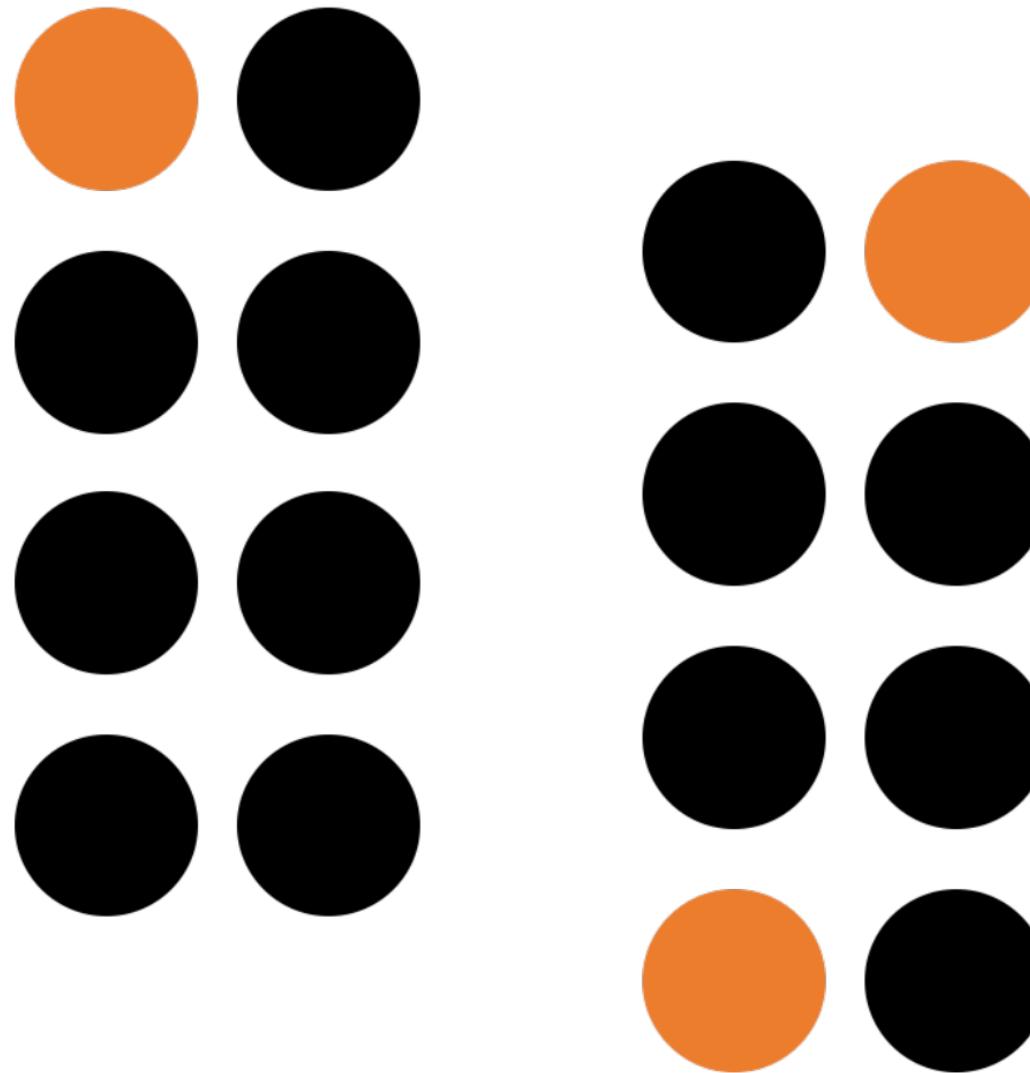


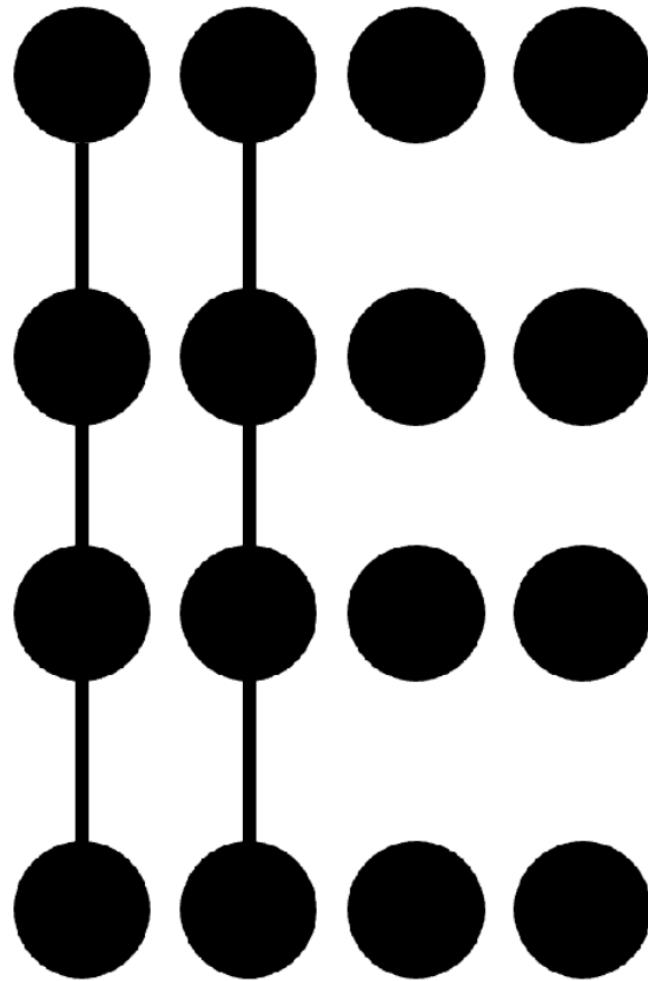


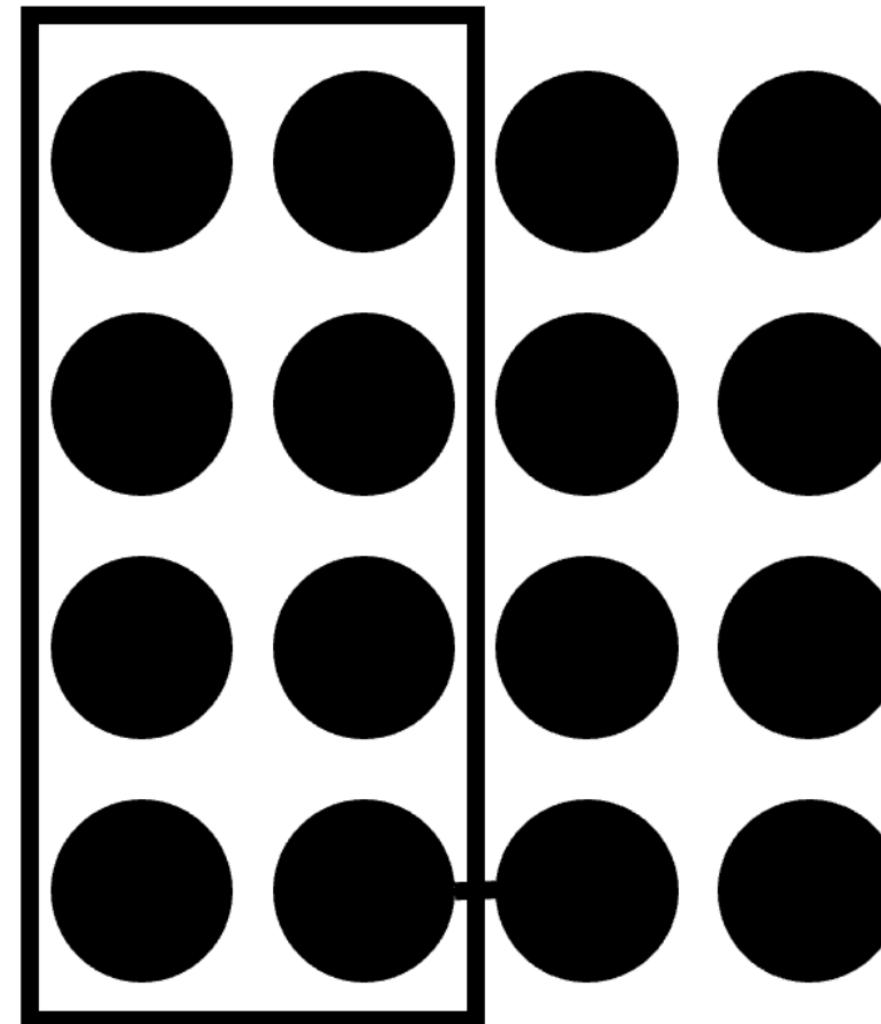


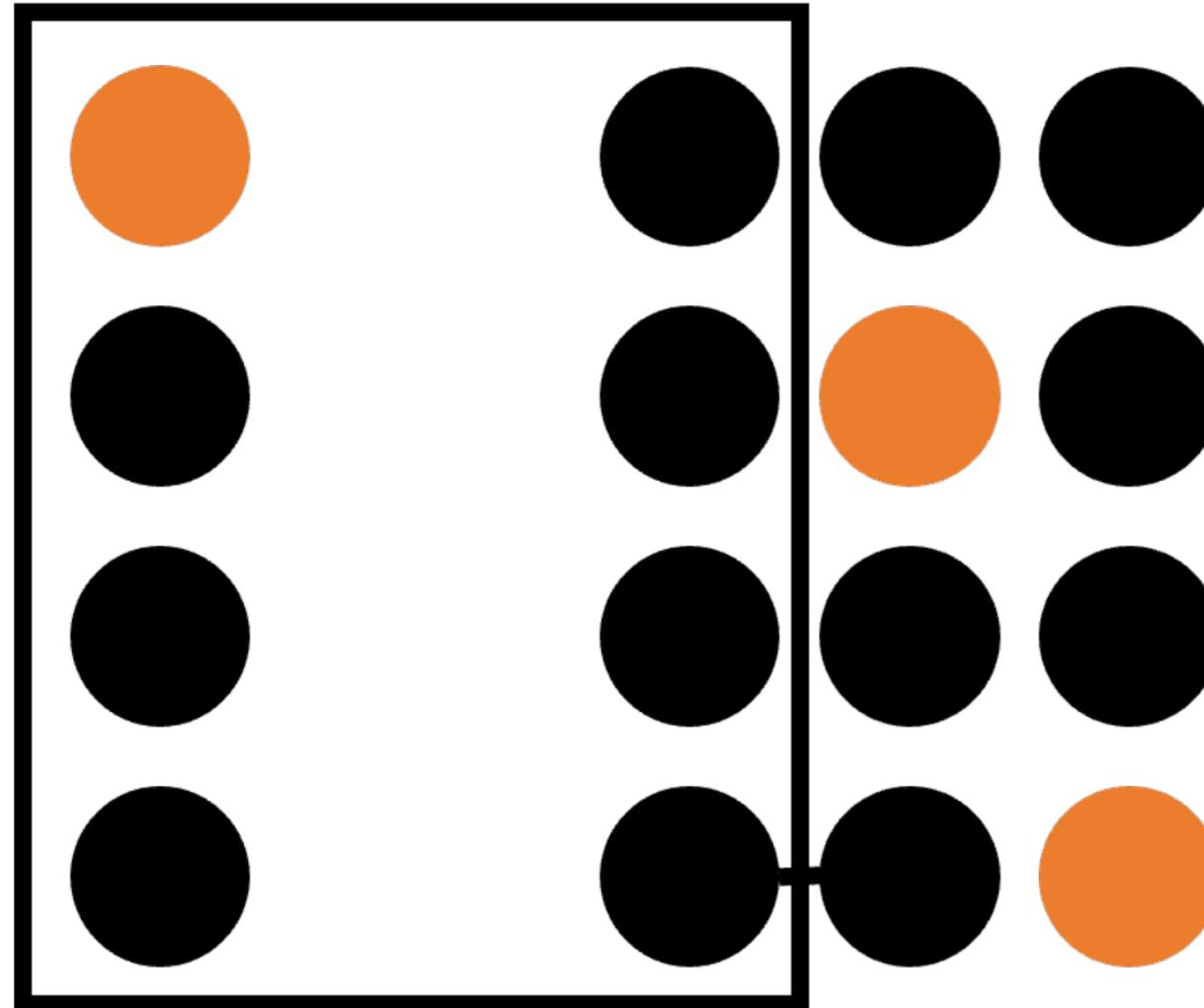












# Event Registration Form

**About This Event**

Event Name	Digital Marketing Masterclass
Date	October 15, 2028
Time	2:00 PM - 4:00 PM
Speaker	Sarah Johnson (Digital Marketing Expert)

**Participant Information**

Full Name  Date of Birth  mm/dd/yyyy

Gender  Male  Female Phone Number  Email

Where did you hear about this virtual event?  
 Facebook  Youtube  Instagram  Twitter  Other:

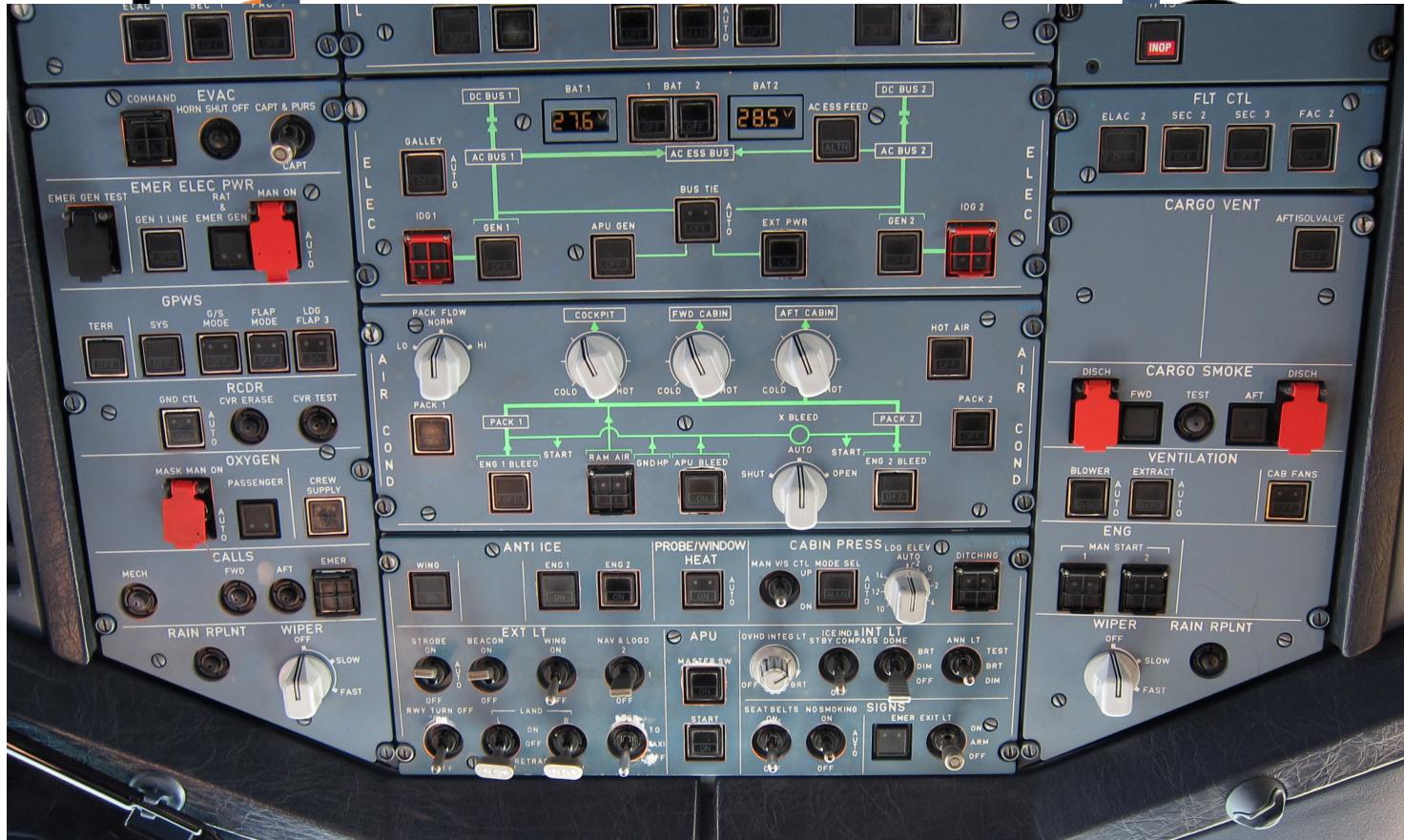
**Payment Information**

Number of Tickets  Payment Method  
 Credit Card  Debit Card  Cash  Check

I understand that participation in this event may involve some degree of risk. I release WebinarPros LLC from any liability for injury, loss, or damage to personal property.  
 Yes, I understand. Signature   
Date Signed  mm/dd/yyyy

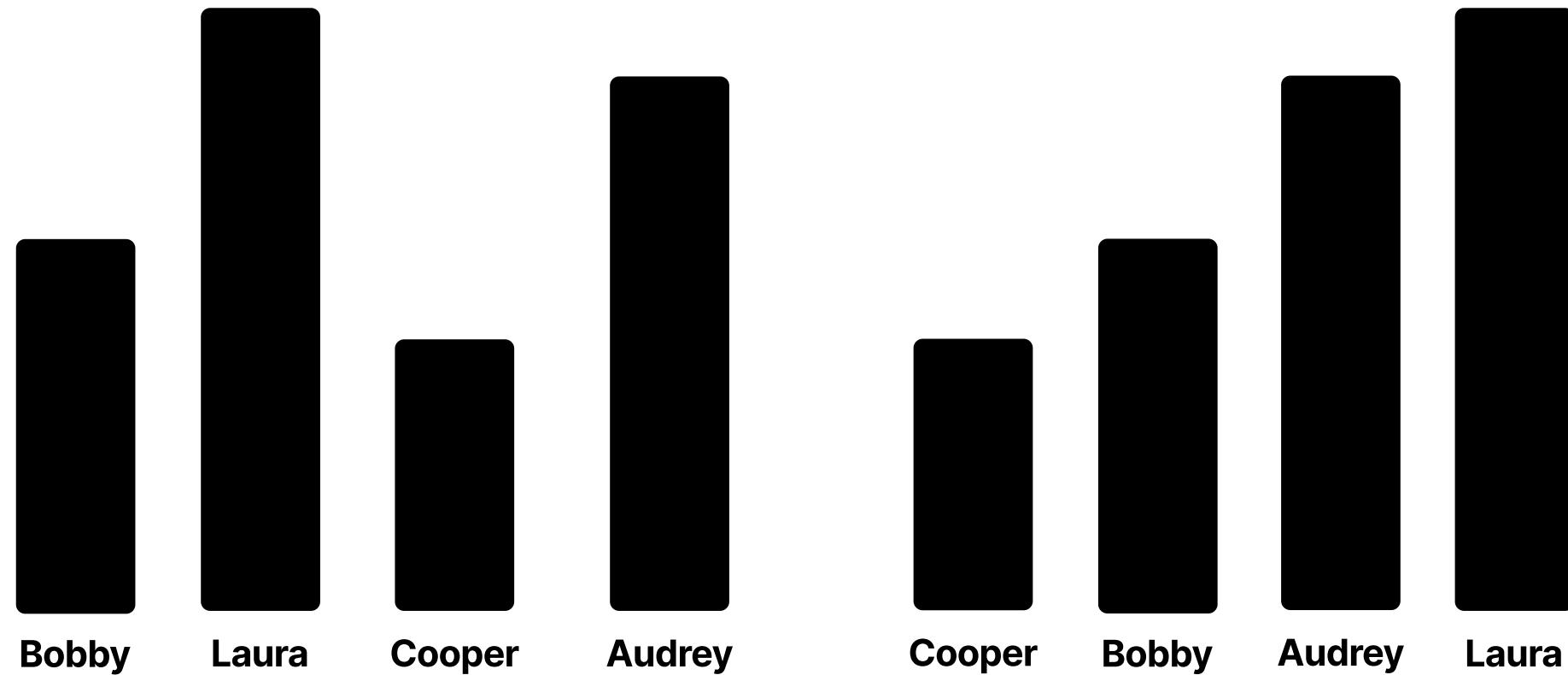
 **Webinar Pros LLC**  Thank you for registering! For inquiries and updates, follow us at @webinarprosLLC on our social media accounts.

## Event Registration Form



Thank you for registering! For inquiries and updates,  
follow us at @webinarprosLLC on our social media accounts.

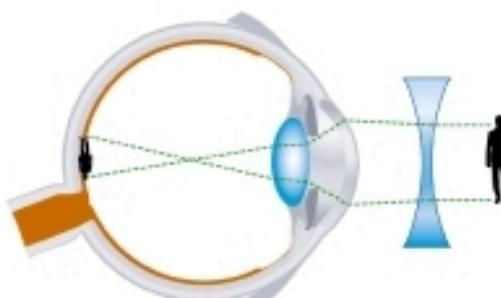
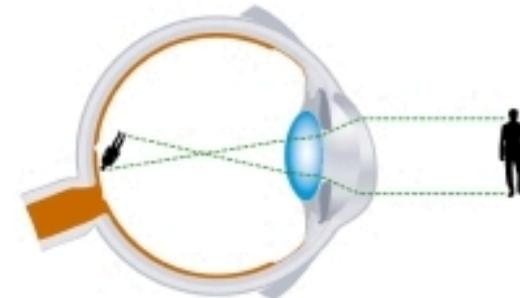
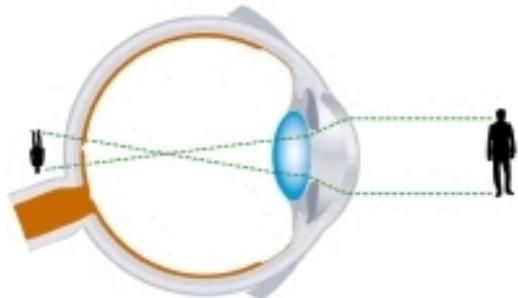
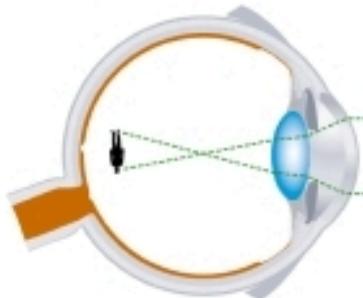
**Perception visuelle: Les lois de la Gestalt - visualisation de données**



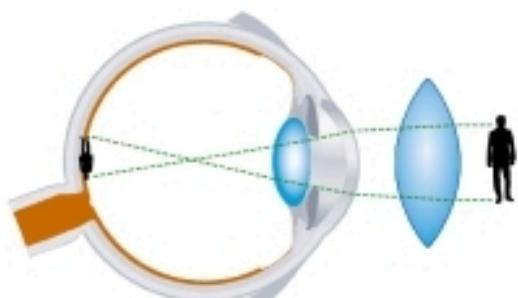
**Perception visuelle: troubles et atteintes**



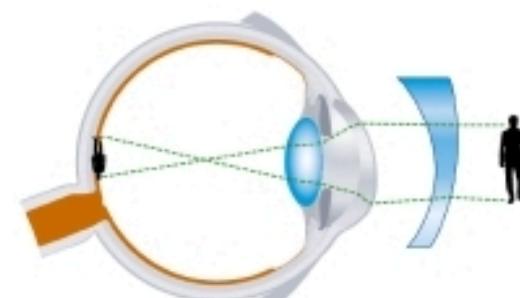
**Perception visuelle: troubles et atteintes**



**Myopie**

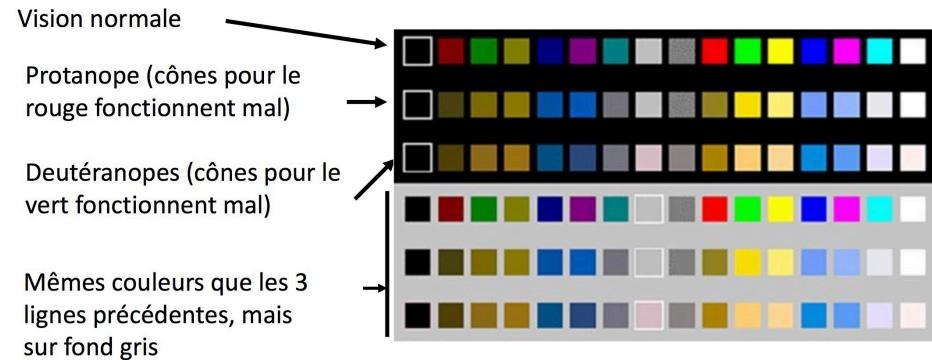


**Hypermétropie**



**Astigmatisme**

## Perception visuelle : daltonisme



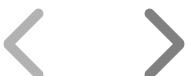
## Perception visuelle et daltonisme : exemples

Source : [colour-blindness.org/guide](http://colour-blindness.org/guide)



## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?



## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

3

## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

6

## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

4

## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

3

## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

2

## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

2



## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

7



## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

5

## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

1



## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

6



## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

Quel est le numéro ?



## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

Quel est le numéro ?

3643227516



## **La mémoire de travail**

Pouvez-vous retenir cette liste de numéro ?

Quel est le numéro ?

3643227516

+ (364) 322-7516 | 36-43-22-75-16



From: <http://psychclassics.yorku.ca/Miller/>

[*Classics Editor's Note: Footnotes are in square brackets; references in round brackets*]

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## **The Magical Number Seven, Plus or Minus Two: Some Limits on our Capacity for Processing Information**[\[1\]](#)

**George A. Miller (1956)**  
*Harvard University*

First published in *Psychological Review*, 63, 81-97.

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My problem is that I have been persecuted by an integer. For seven years this number has followed me around, has intruded in my most private data, and has assaulted me from the pages of our most public journals. This number assumes a variety of disguises, being sometimes a little larger and sometimes a little smaller than usual, but never changing so much as to be unrecognizable. The persistence with which this number plagues me is far more than a random accident. There is, to quote a famous senator, a design behind it, some pattern governing its appearances. Either there really is something unusual about the number or else I am suffering from delusions of persecution.



## **La mémoire: L'effet Zeigarnik**

*« Nos esprits oublient rapidement les tâches finies. Cependant, ils sont programmés pour nous rappeler incessamment celles que nous ne terminons pas. » - Dr. Bluma Zeigarnik*

### **Applications :**

- Au cinéma : l'utilisation d'un cliffhanger (À SUIVRE/ c'est l'équivalent d'une pause)
- Indication de completion de profil
- Visualiser la progression d'un procédé pas à pas
- Limite: il est nécessaire que votre objectif vous passionne un minimum, et que vous ayez vraiment envie de le voir accompli...



## **La prise de décision : La loi de Hick**

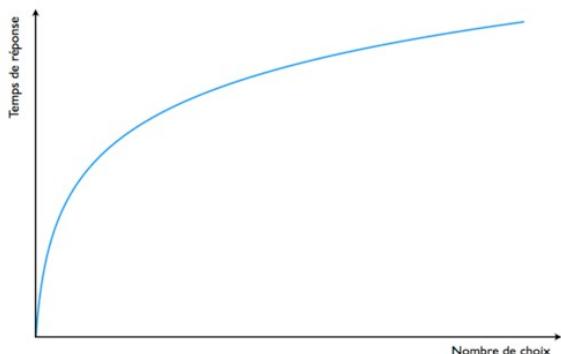
### **Situation**

- Plus l'on donne de choix à un utilisateur, plus la réponse de celui-ci sera longue et différée
- Appliquable aux menus, liens croisés, pages inutiles, boutons redondants et non pertinents



## La prise de décision : La loi de Hick

Loi de Hick, temps de réponse en fonction du nombre de choix



**Hick's Law**

$$RT = a + b \log_2(n)$$

Response time      Time not involved with decision making      Cognitive processing time per option      Number of alternatives

Formule. T : le temps de réponse. a et b : une constante expérimentale en fonction de la situation. n le nombre de choix.

## La prise de décision : La loi de Hick

<https://arngren.net/>

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Teknologi & Gadgets

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(Fra 07.11.2004)  
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**Elektriske-Kjøretøy** - Roboter

**el-ATV**

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**Forbruker Elektronikk**

**el-Sykkel & el-Moped**

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**AMG**

**Gratis Mobiltele-Spill**

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**6,7hk** Gressklipper kr 3.998,-

**John Deere** Sno-kjøring fra kr 14.998,-

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**Ingen aldersgrense. el-scooter-sykkel** 9.998,-

**el-fatbike Sammenleggbar** 12.998,-

**el-sykkel** 750W/48v

**Fatbike-1500w** 16.998,-

**el-bil** kr 79.998,-

**el-bil (Sertifikat-fri)** 3-hjul kr 39.998,-

**Torro**

**el-ATV**

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**Elektrisk-Sykkel**



## Performance motrice: La loi de Fitts (1954)

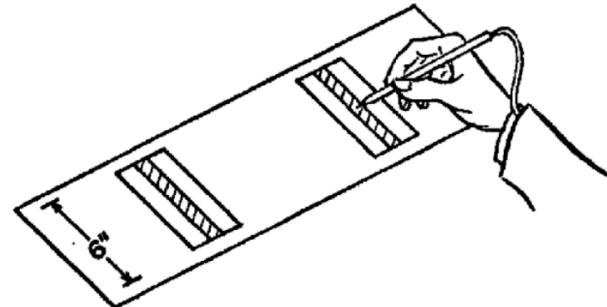


FIG. 1. Reciprocal tapping apparatus. The task was to hit the center plate in each group alternately without touching either side (error) plate.

$$T = a + b \log_2 \left( 1 + \frac{D}{W} \right)$$

T : le temps d'exécution

a : l'ordonnée à l'origine (temps incompressible du temps de réaction + du mouvement + ...)

b : la pente (constante liée à l'utilisateur et au dispositif)

D : la distance à la cible

W : La largeur de la cible

## La loi de Fitts

Source : [Visualizing Fitts's Law](#)



Facilement atteignable



Atteignable

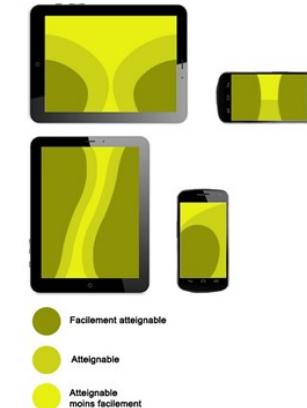
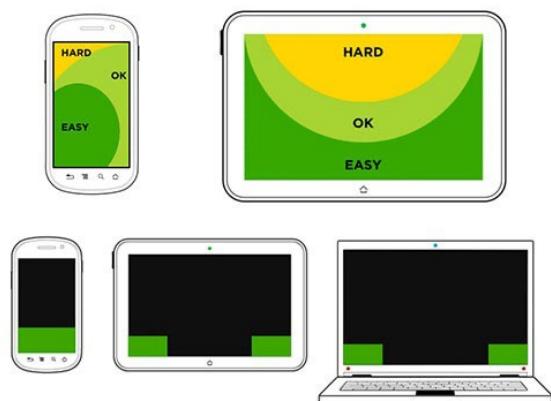


Atteignable  
moins facilement

## La loi de Fitts

Adaptée aux écrans tactiles

Source : [Visualizing Fitt's Law](#)



## Solution de la recherche en interaction humain-ordinateur au problème du pointage



What the user sees



What the system sees

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Bubble cursor.CHI 2005, Tovi Grossman, Ravin Balakrishnan  
Drag & PopProceedings of Interact 2003 Patrick Baudisch, Edward Cutrell, Dan Robbins, Mary Czerwinski, Peter Tandler, Benjamin Bederson, Alex Zierlinger  
Semantic PointingCHI 2004 Renaud Blanch, Yves Guiard, Michel Beaudouin-Lafon

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## QUESTIONS ?

Semaine prochaine:

- Méthodologie de conception centrée sur l'utilisateur

