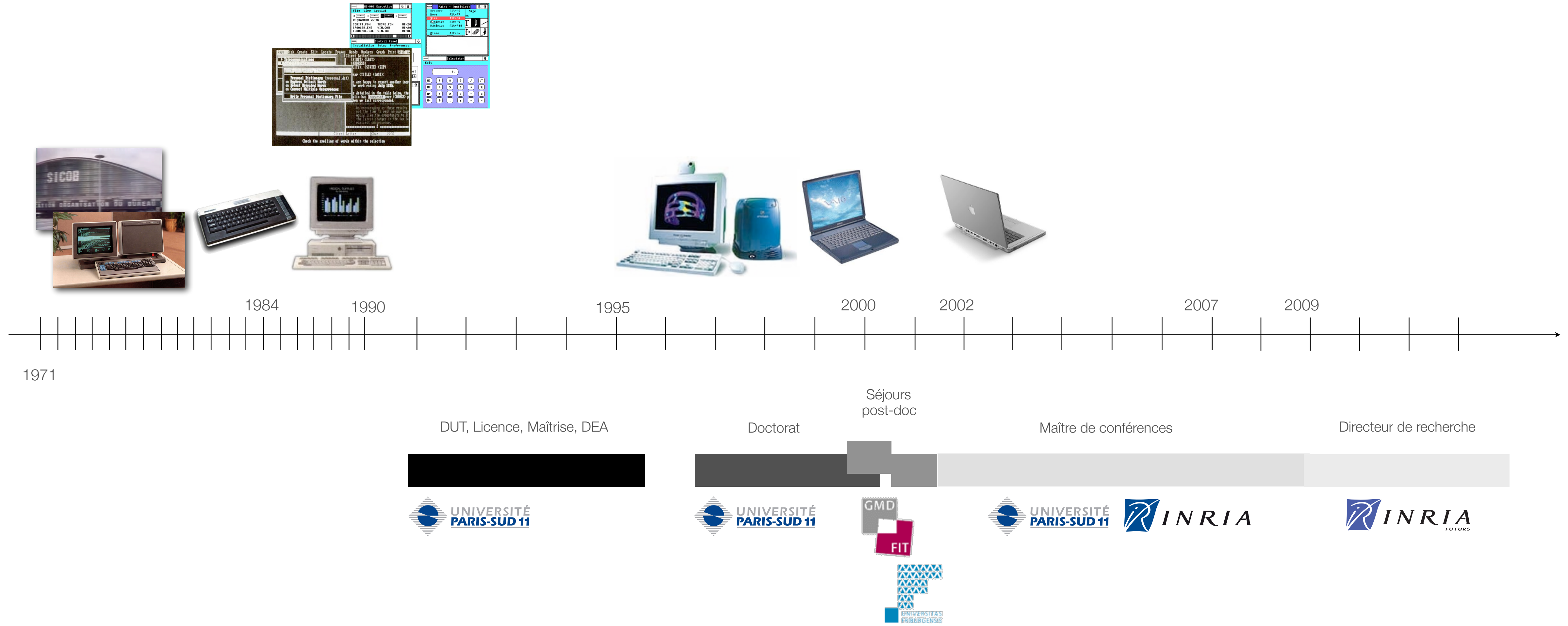


**Les systèmes autonomes
sont des outils informatiques
comme les autres**

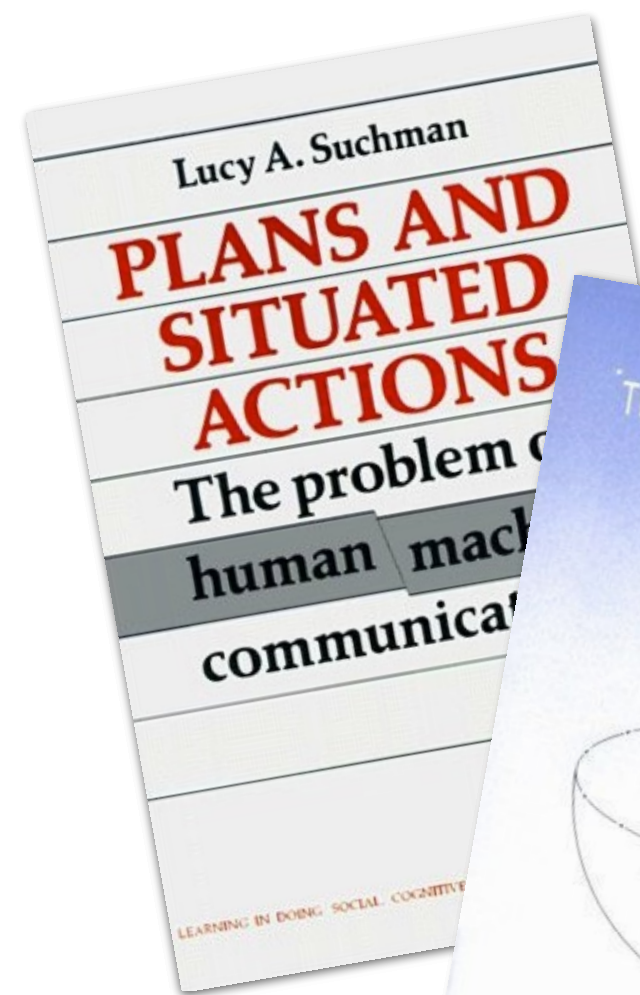
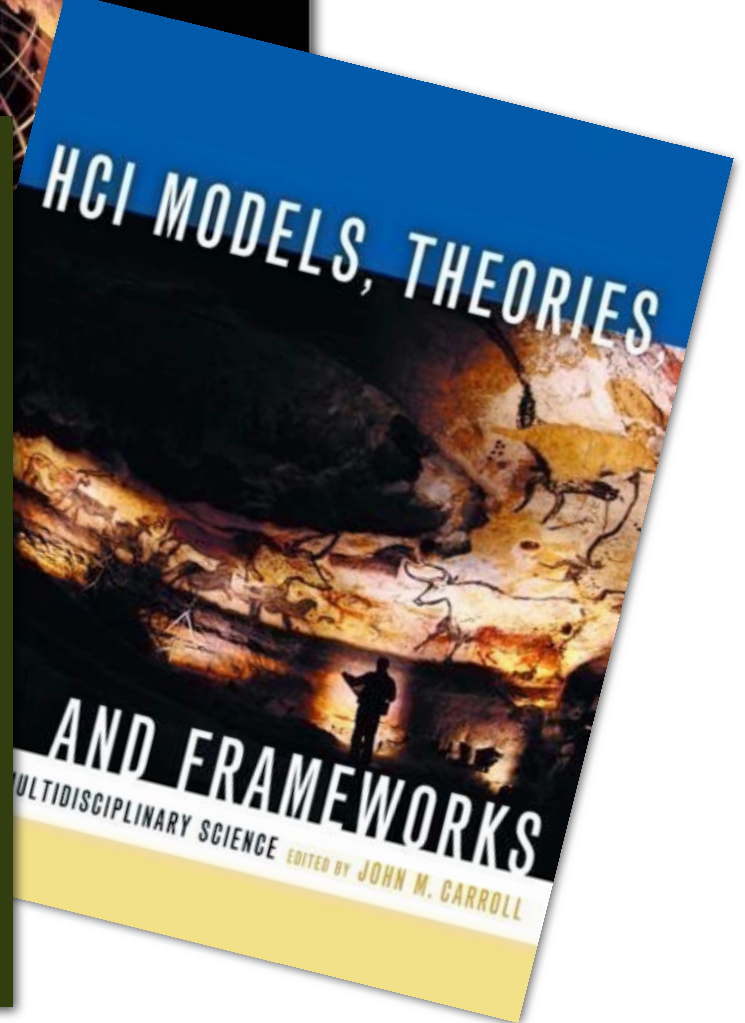
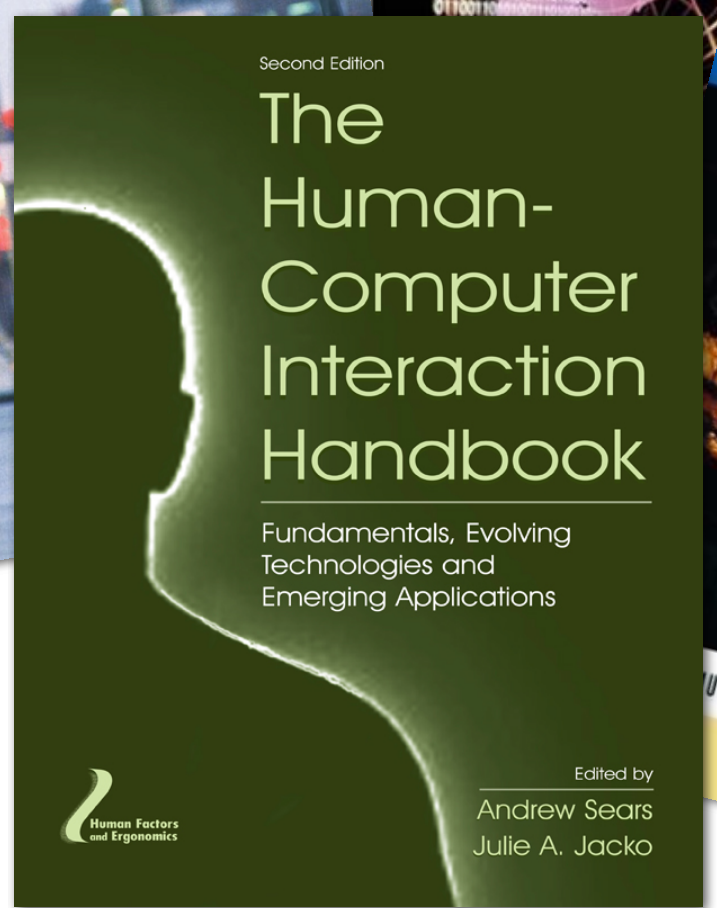
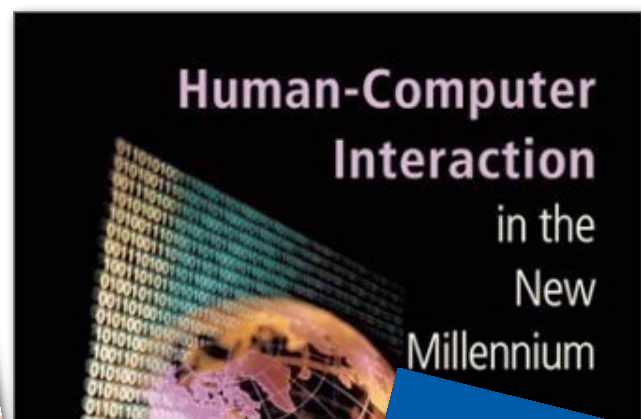
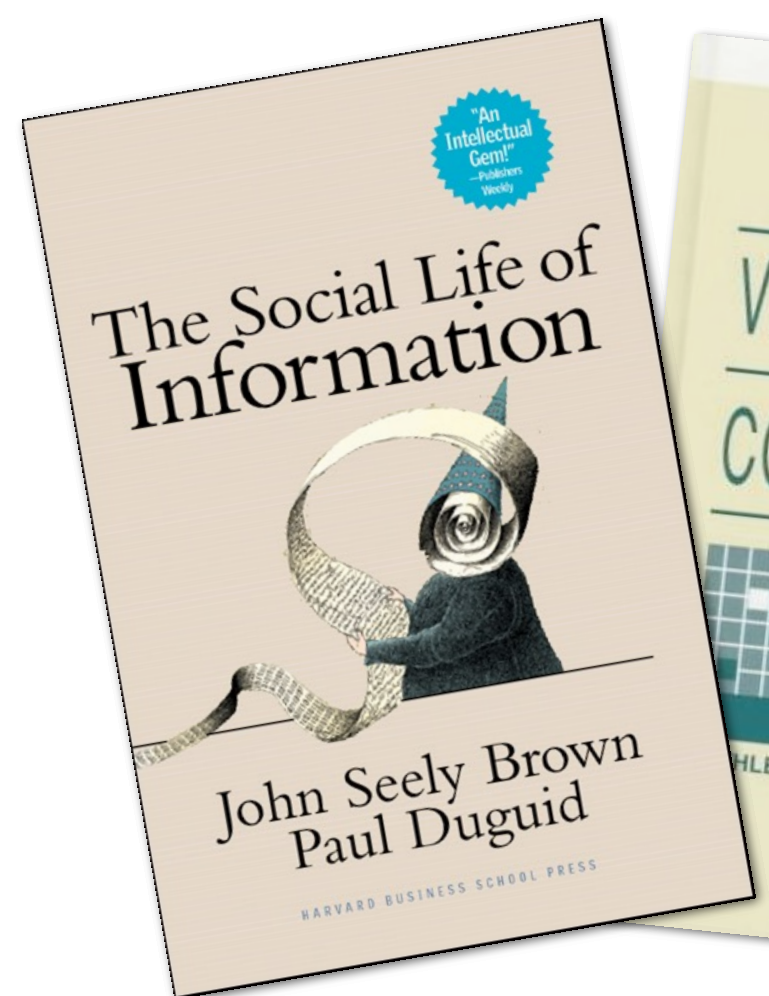
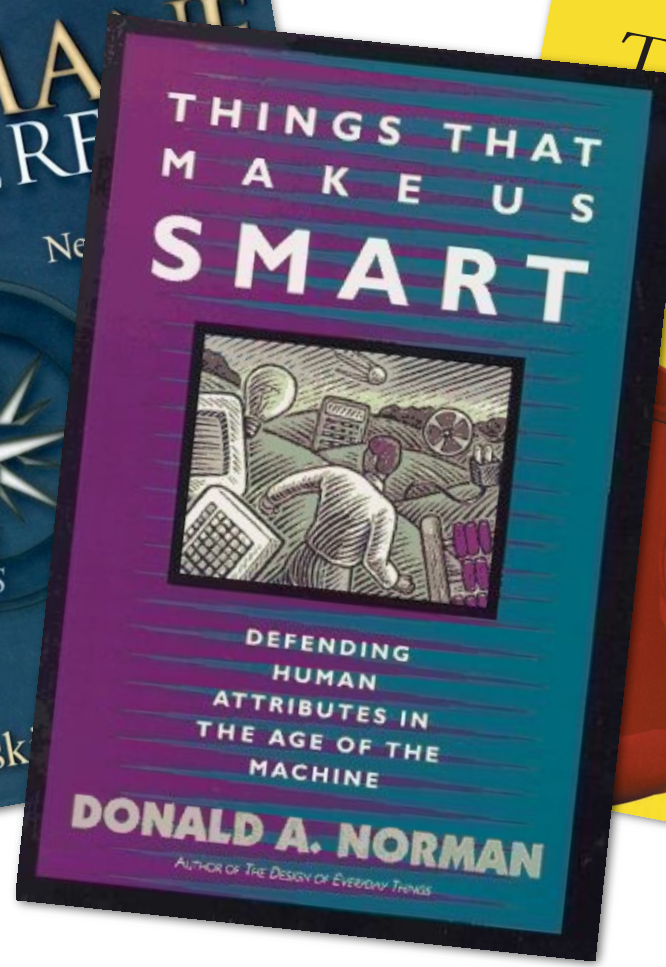
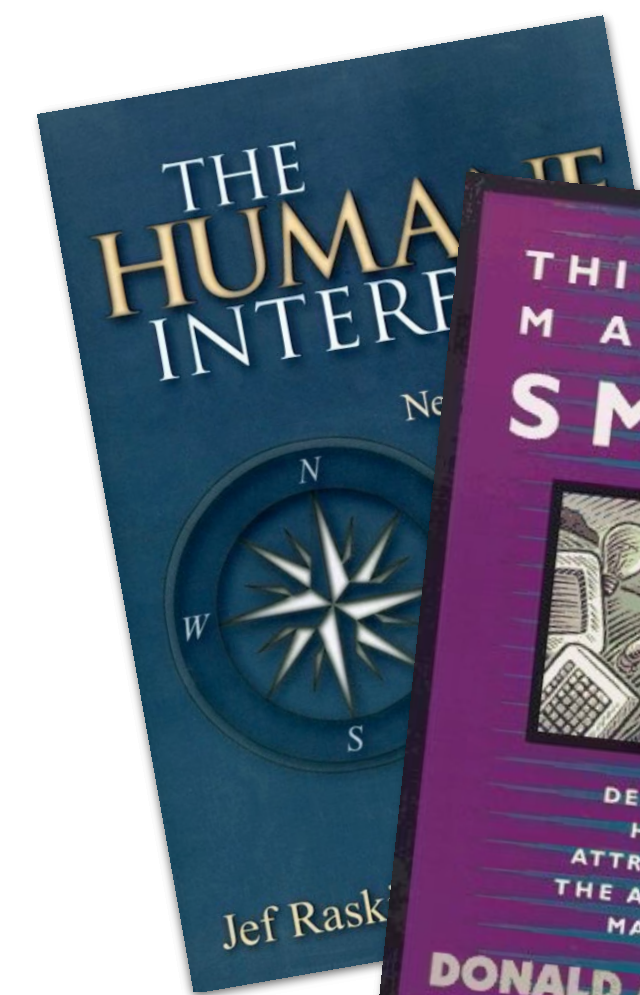
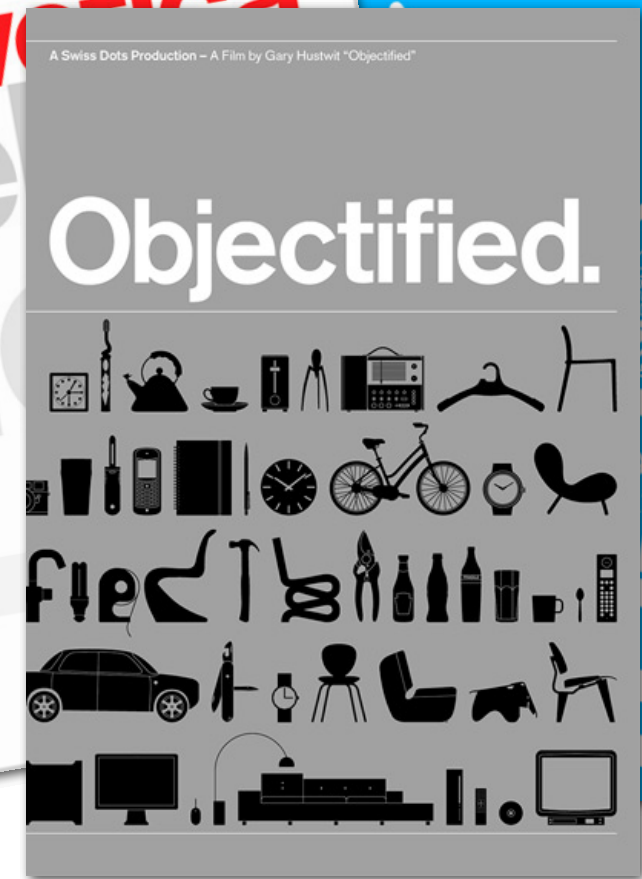
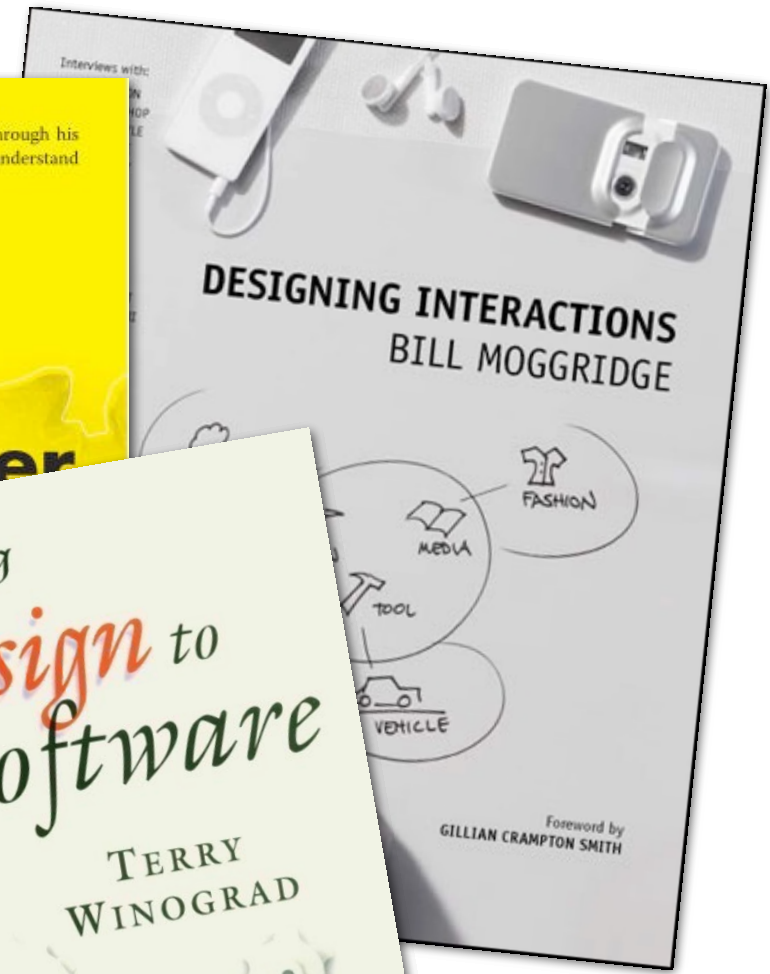
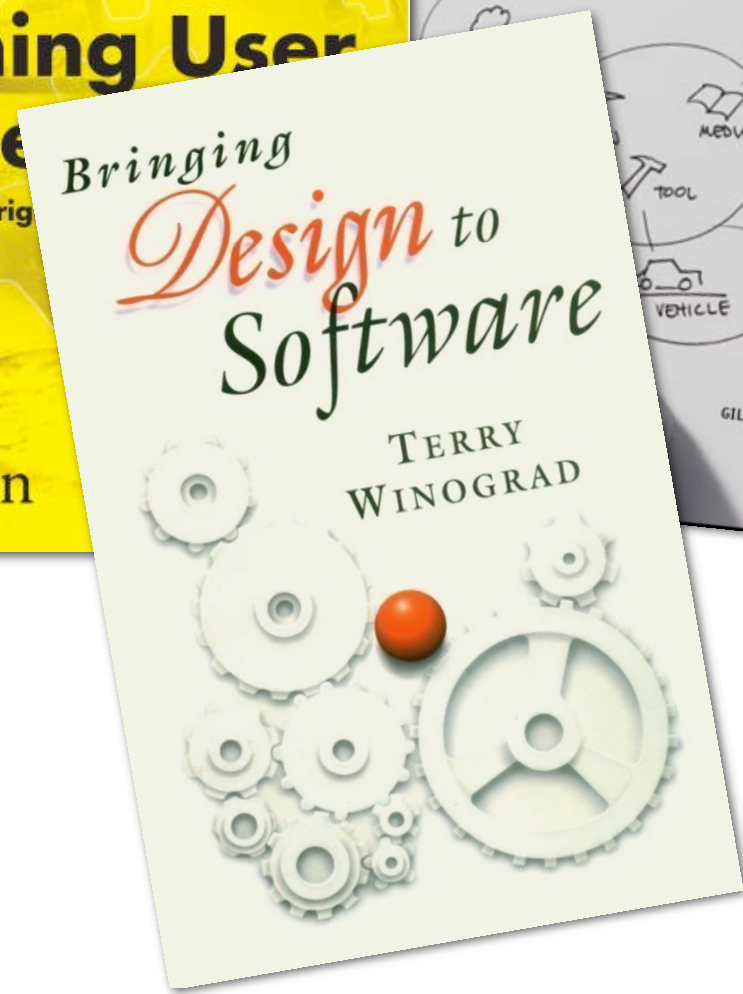
Nicolas Roussel

<http://tmpnam.org/~rousseau/>
<mailto:nicolas.rousseau@inria.fr>

Mon parcours



Interaction Homme-Machine



Communication médiatisée (1995 - 2009)

Interaction graphique "desktop" (depuis 2000)

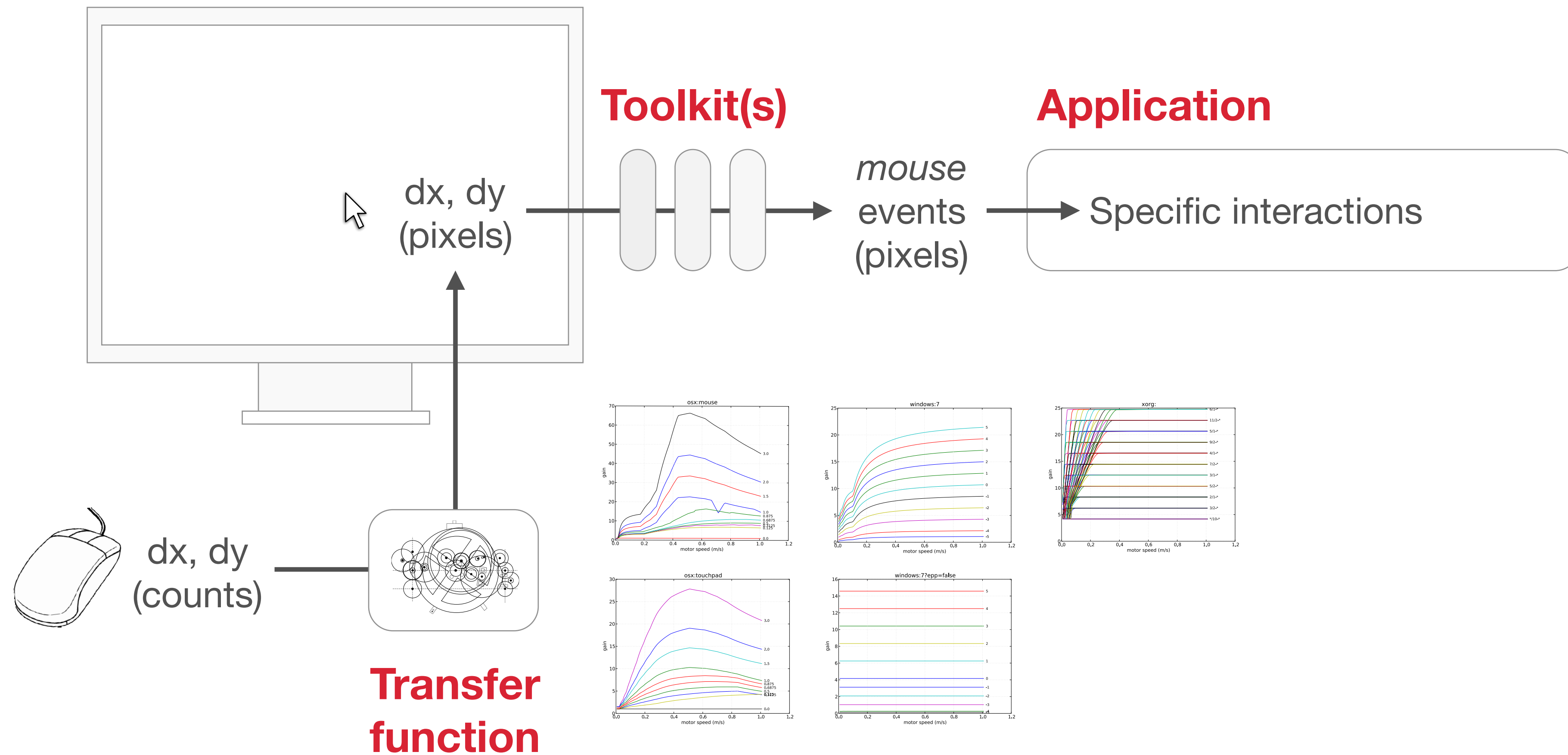
Pré-traitement des données d'entrée (depuis 2010)

Interaction tactile et gestuelle (depuis 2010)

Interaction cerveau-ordinateur (depuis 2013)

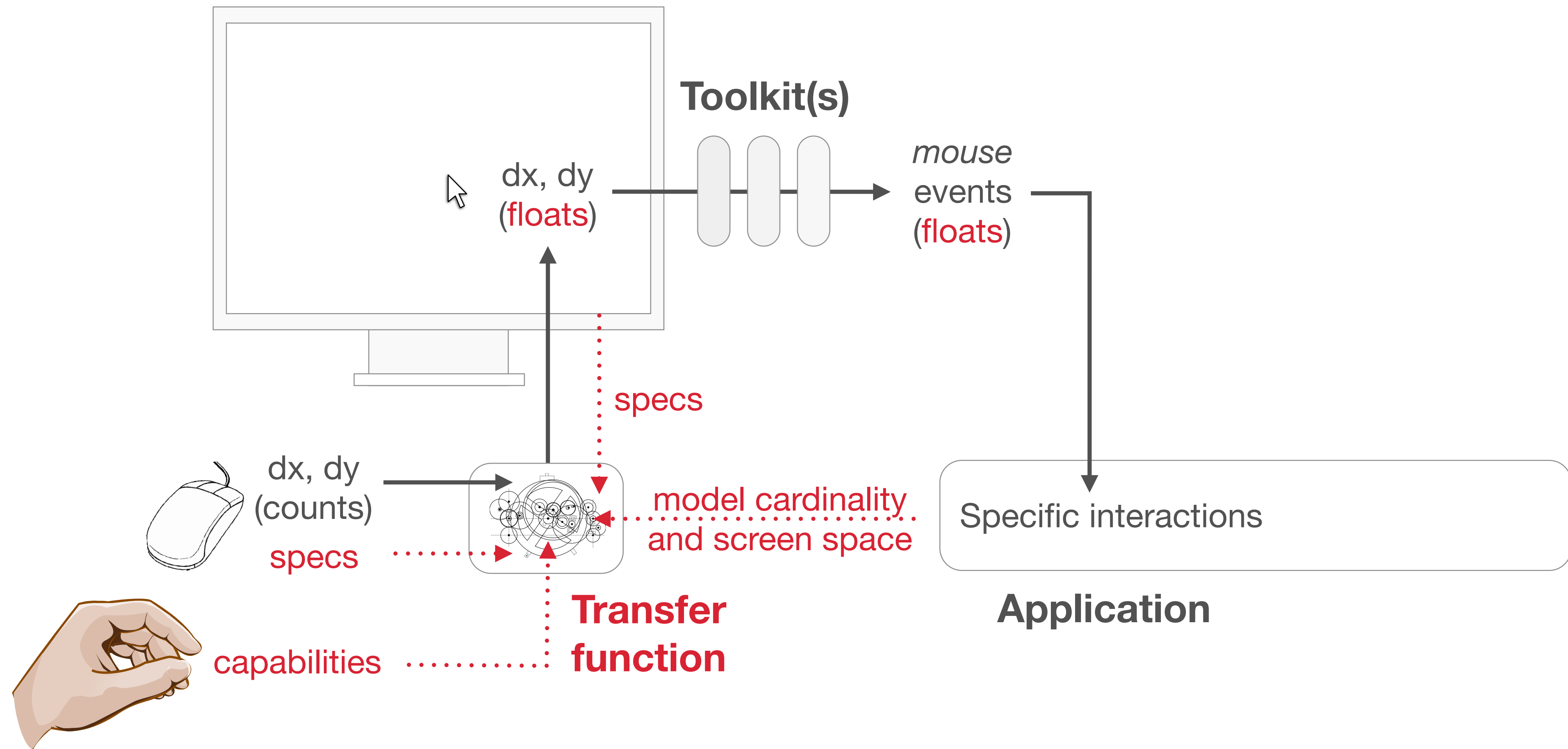
Transitions animées (depuis 2014)

Déconstruction du pointage indirect



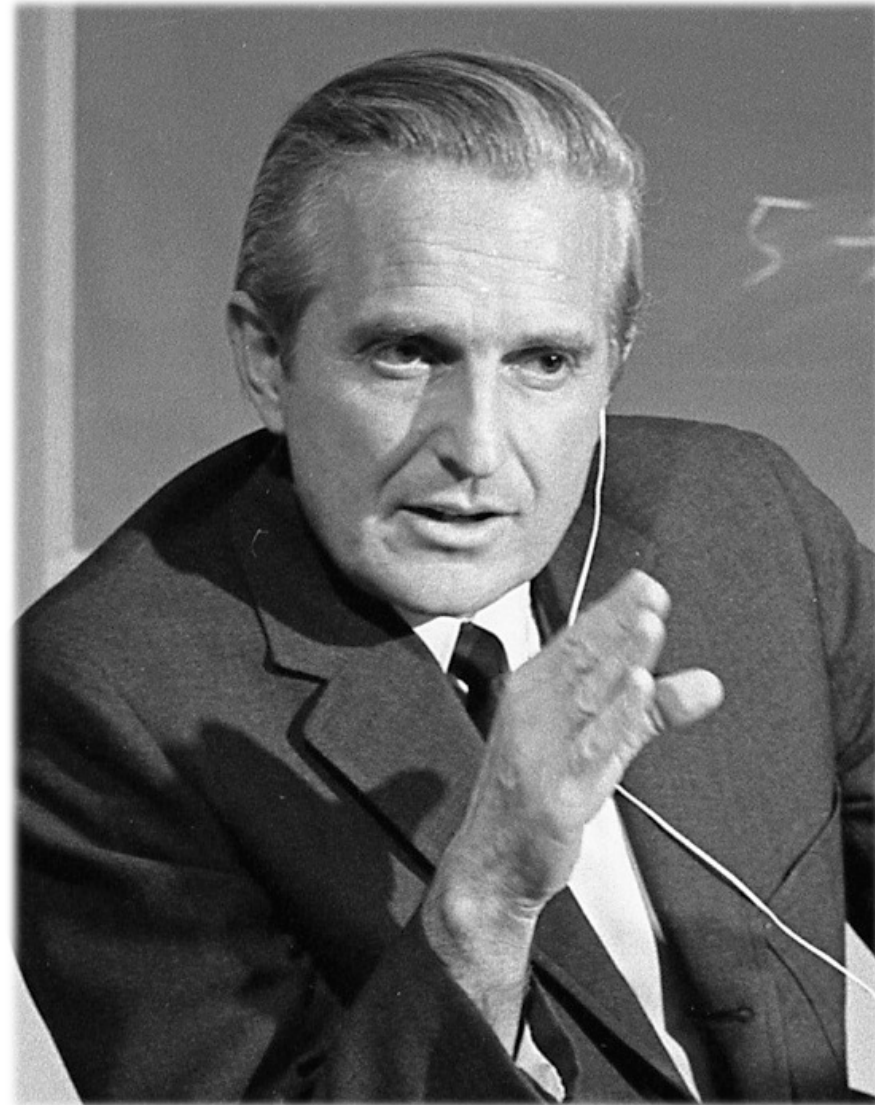
G. Casiez and N. Roussel. "No more bricolage! Methods and tools to characterize, replicate and compare pointing transfer functions". In *Proceedings of UIST'11*, p. 603-614, October 2011. ACM.

Déconstruction du pointage indirect



N. Roussel, G. Casiez, J. Aceituno and D. Vogel. "Giving a hand to the eyes: leveraging input accuracy for subpixel interaction". In *Proceedings of UIST'12*, p. 351-358, October 2012. ACM.

J. Aceituno, G. Casiez and N. Roussel. "How low can you go? Human limits in small unidirectional mouse movements". In *Proceedings of CHI'13*, p. 1383-1386, April 2013. ACM.



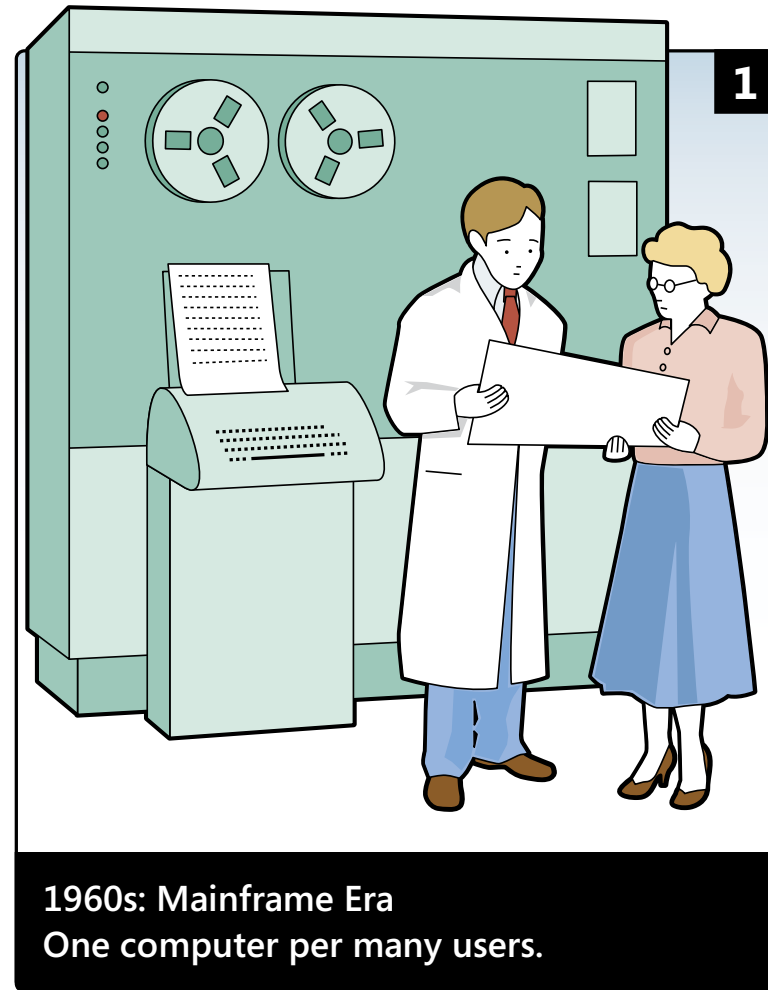
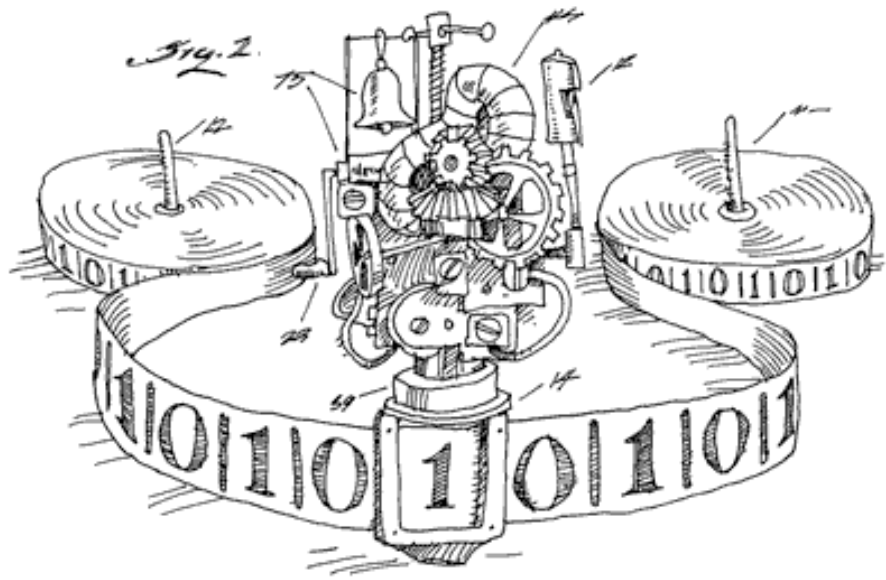
Douglas Engelbart, inventeur et visionnaire

J. Aceituno & N. Roussel, janvier 2014

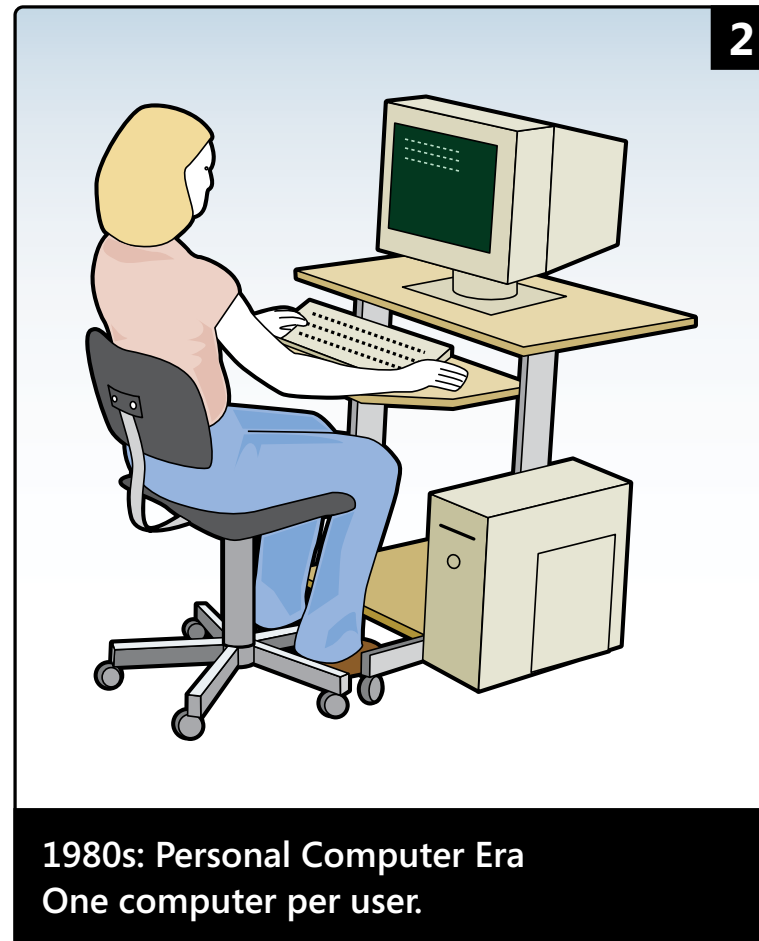
<https://hal.inria.fr/hal-01114381>



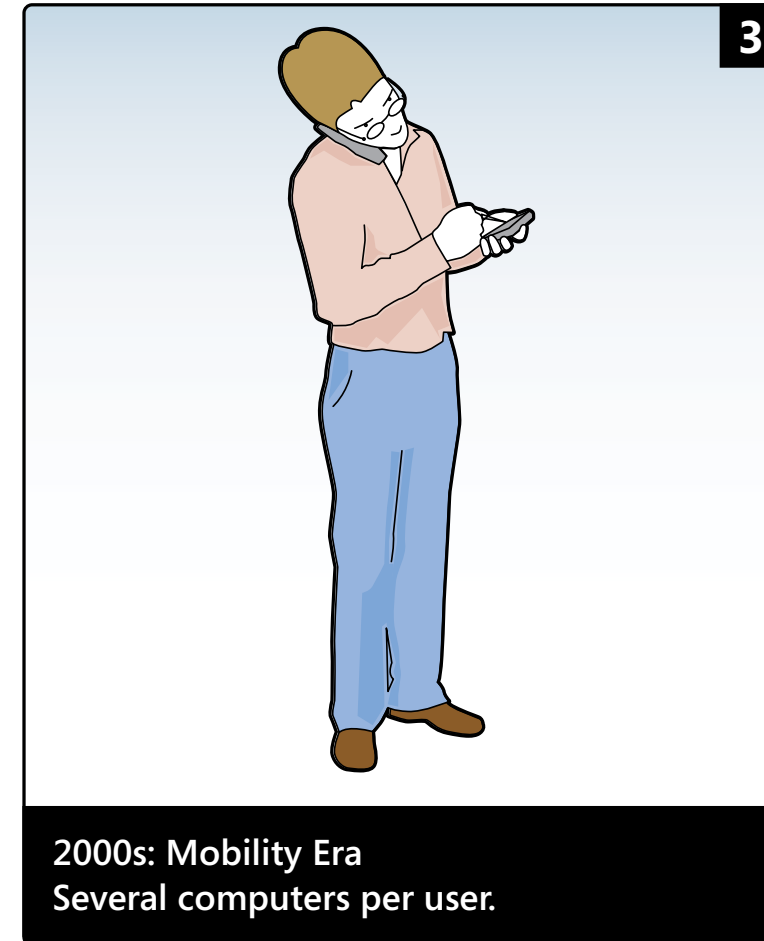
Interaction Homme-Machine



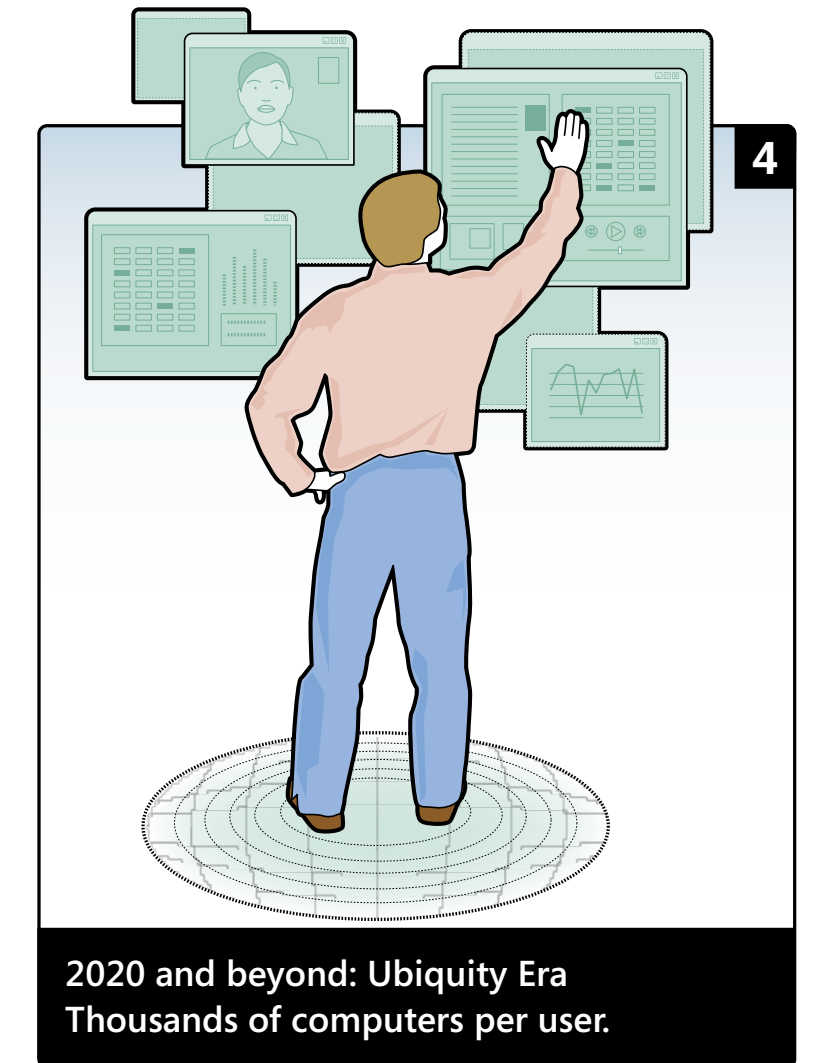
1960s: Mainframe Era
One computer per many users.



1980s: Personal Computer Era
One computer per user.



2000s: Mobility Era
Several computers per user.



2020 and beyond: Ubiquity Era
Thousands of computers per user.

Reconnaissance de geste

Reconnaissance vocale

Reconnaissance d'activité

Reconnaissance de l'environnement

Vers un futur sans écran,
ni clavier, ni souris ?



TDC N°997 - 1 JUIN 2010

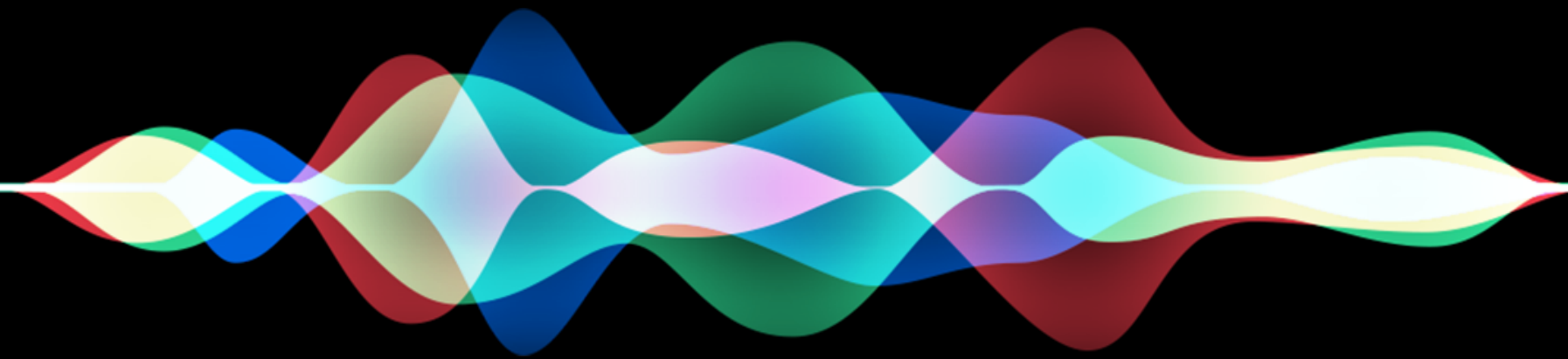
<http://www.reseau-canope.fr/tdc/tous-les-numeros/l'informatique/interview/article/linria.html>

Vers des systèmes autonomes ?



L'invité de 8h20 : le grand entretien (17 mars 2018)

<https://www.franceinter.fr/emissions/l-invite-de-8h20-le-grand-entretien/l-invite-de-8h20-le-grand-entretien-17-mars-2018>



Amazon's Alexa started ordering people dollhouses after hearing its name on TV

Google's Super Bowl ad accidentally set off a lot of Google Homes

Amazon's Echo is bringing the eighties back, and not always in a good way



https://youtu.be/4aGXEJ_9G3Y



<https://youtu.be/gUIKtqyUlo8>



On n'est pas couché (24 mars 2018)

<https://youtu.be/SKLTBrBT4js>



<https://youtu.be/Y3HCTVv3qME>



<https://youtu.be/uCezICQNgJU>

**Comment savoir
ce que sait faire un système autonome ?**

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu'il ne sait pas faire ?

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu'il ne sait pas faire ?

Comment savoir ce qu'il fait ?

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu'il ne sait pas faire ?

Comment savoir ce qu'il fait ?

**Comment comprendre
pourquoi et comment il le fait ?**

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu'il ne sait pas faire ?

Comment savoir ce qu'il fait ?

Comment comprendre
pourquoi et comment il le fait ?

Comment influencer sur ce qu'il fait ?

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu'il ne sait pas faire ?

Comment savoir ce qu'il fait ?

Comment comprendre
pourquoi et comment il le fait ?

Comment influencer sur ce qu'il fait ?

Comment lui (re)prendre le contrôle ?

Comment savoir
ce que sait faire un système autonome ?

Comment savoir ce qu'il ne sait pas faire ?

Comment savoir ce qu'il fait ?

Comment comprendre
pourquoi et comment il le fait ?

Comment influencer sur ce qu'il fait ?

Comment lui (re)prendre le contrôle ?

Veut-on réellement de ce système ?

Les systèmes autonomes sont des outils informatiques comme les autres

The design of everyday things

Don Norman
1988, 1990, 2002, 2013

CHAPTER TWO

THE PSYCHOLOGY OF EVERYDAY ACTIONS

During my family's stay in England, we rented a furnished house while the owners were away. One day, our landlady returned to the house to get some personal papers. She walked over to the old, metal filing cabinet and attempted to open the top drawer. It wouldn't open. She pushed it forward and backward, right and left, up and down, without success. I offered to help. I wiggled the drawer. Then I twisted the front panel, pushed down hard, and banged the front with the palm of one hand. The cabinet drawer slid open. "Oh," she said, "I'm sorry. I am so bad at mechanical things." No, she had it backward. It is the mechanical thing that should be apologizing, perhaps saying, "I'm sorry. I am so bad with people."



My landlady had two problems. First, although she had a clear goal (retrieve some personal papers) and even a plan for achieving that goal (open the top drawer of the filing cabinet, where those papers are kept), once that plan failed, she had no idea of what to do. But she also had a second problem: she thought the problem lay in her own lack of ability: she blamed herself, falsely.

How was I able to help? First, I refused to accept the false accusation that it was the fault of the landlady: to me, it was clearly a fault in the mechanics of the old filing cabinet that prevented the drawer from opening. Second, I had a conceptual model of how the cabinet worked, with an internal mechanism that held the door shut in normal usage, and the belief that the drawer mechanism was probably out of alignment. This conceptual model gave me a plan: wiggle the drawer. That failed. That caused me to modify

my plan: wiggling may have been appropriate but not forceful enough, so I resorted to brute force to try to twist the cabinet back into its proper alignment. This felt good to me—the cabinet drawer moved slightly—but it still didn't open. So I resorted to the most powerful tool employed by experts the world around—I banged on the cabinet. And yes, it opened. In my mind, I decided (without any evidence) that my hit had jarred the mechanism sufficiently to allow the drawer to open.

This example highlights the themes of this chapter. First, how do people do things? It is easy to learn a few basic steps to perform operations with our technologies (and yes, even filing cabinets are technology). But what happens when things go wrong? How do we detect that they aren't working, and then how do we know what to do? To help understand this, I first delve into human psychology and a simple conceptual model of how people select and then evaluate their actions. This leads the discussion to the role of understanding (via a conceptual model) and of emotions: pleasure when things work smoothly and frustration when our plans are thwarted. Finally, I conclude with a summary of how the lessons of this chapter translate into principles of design.

How People Do Things: The Gulfs of Execution and Evaluation

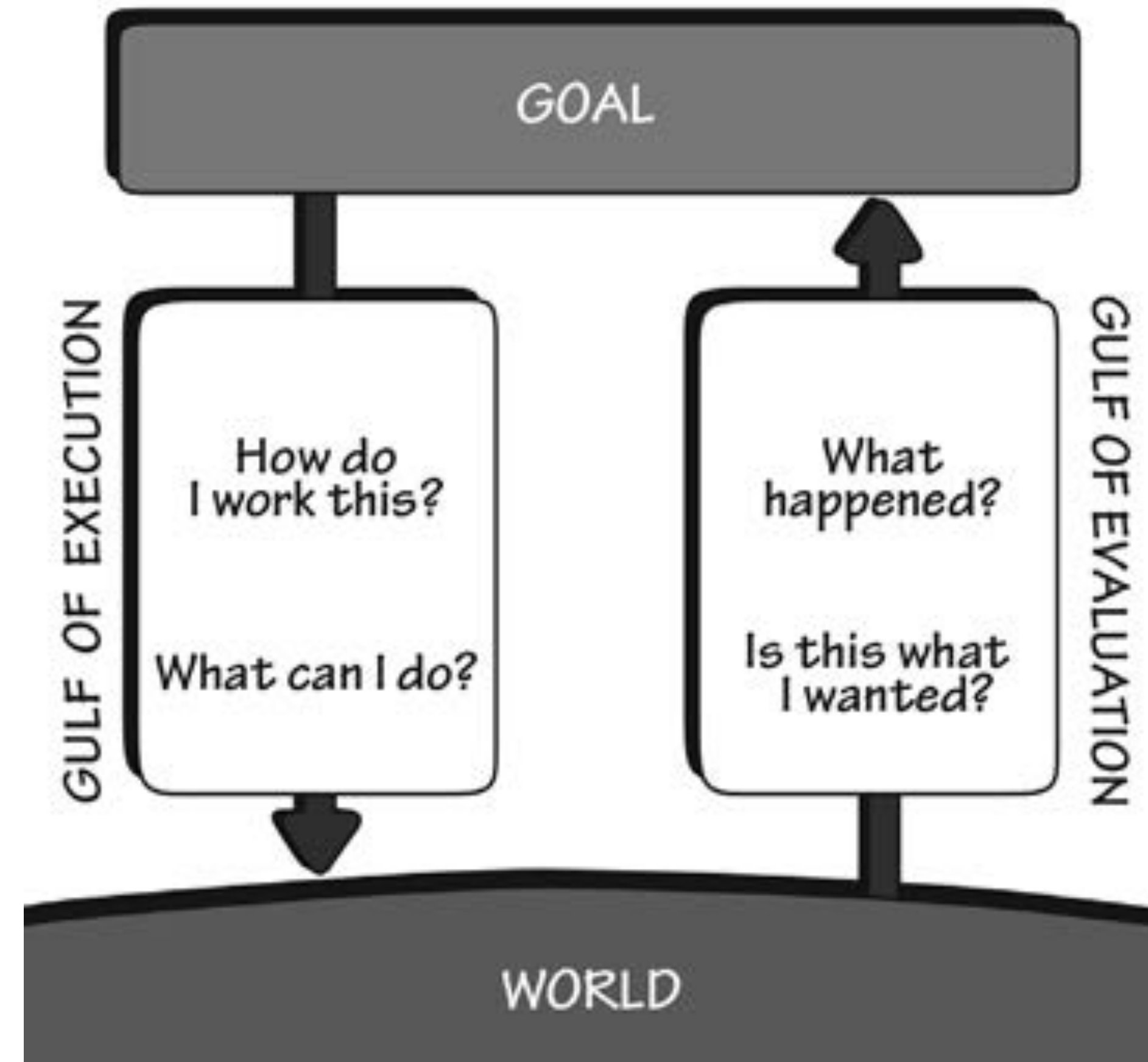
When people use something, they face two gulfs: the Gulf of Execution, where they try to figure out how it operates, and the Gulf of Evaluation, where they try to figure out what happened (Figure 2.1). The role of the designer is to help people bridge the two gulfs.

In the case of the filing cabinet, there were visible elements that helped bridge the Gulf of Execution when everything was working perfectly. The drawer handle clearly signified that it should be pulled and the slider on the handle indicated how to release the catch that normally held the drawer in place. But when these operations failed, there then loomed a big gulf: what other operations could be done to open the drawer?

The design of everyday things

Don Norman

1988, 1990, 2002, 2013

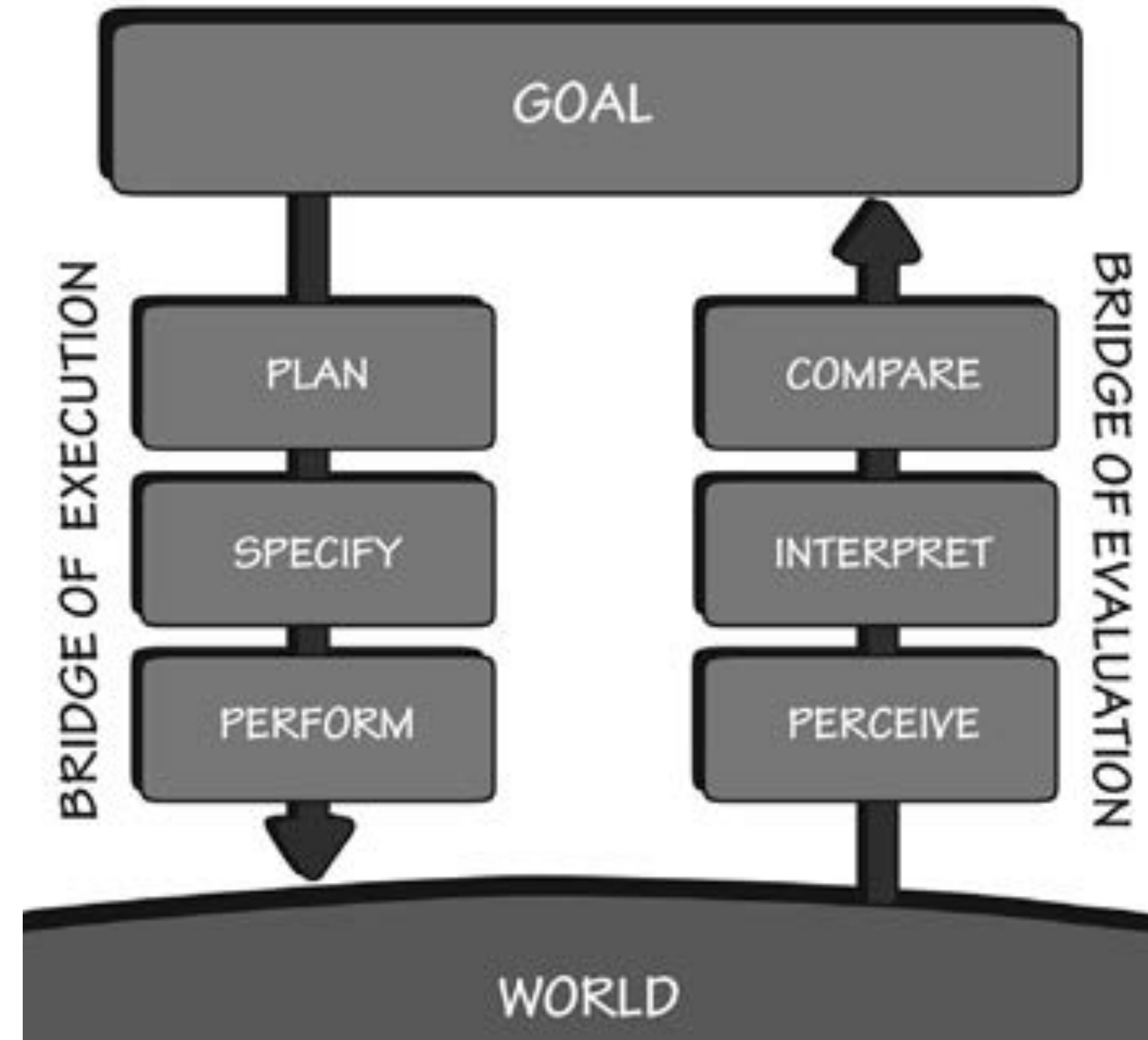


*The gulfs of execution
and evaluation*

The design of everyday things

Don Norman

1988, 1990, 2002, 2013



*The seven stages
of the action cycle*

Modèle conceptuel

Construit sur la base de connaissances
et d'expériences

Ce que nous croyons savoir sur un objet,
une procédure, un système

Non nécessairement complet ou correct,
mais "suffisamment bon" pour être utile

**Le bon outil transparent n'est pas
celui que vous ne pouvez pas voir**



Quand la caméra se cache : la porte sans vitre...

<https://m.ina.fr/video/VDD10007920/la-porte-sans-vitre-video.html>

Le bon outil transparent n'est pas
celui que vous ne pouvez pas voir

**C'est celui qui ne vous gêne pas,
vous laisse vous concentrer sur
votre tâche**

**Le bon outil doit aussi permettre
un usage analytique...**

Rendre les choses visibles

Permettre de déterminer l'état du système

Rendre les choix visibles

Rendre les effets des actions visibles

Permettre l'abduction et le test d'hypothèses

**La technologie n'est pas
une chose qui "arrive"**

La technologie n'est pas
une chose qui "arrive"

**La technologie se décide,
elle se conçoit**

Pourquoi fait-on ces choses ?

Pour quoi fait-on ces choses ?

"Because we can" ?

"Because we can't" ?



So, they've started psi research because they thought we were doing psi research, when in fact we weren't doing psi research?

Yes, sir. But now that they're doing psi research, we're gonna have to do psi research, sir.

Comment fait-on ces choses ?

"[.....] by design" ?

"l'humain dans la boucle" ?

***Science finds,
Industry applies,
Man adapts***

Exposition universelle, 1833

***People propose,
Science studies,
Technology conforms***

Don Norman, 1993

Les systèmes autonomes sont des outils informatiques comme les autres

Ils doivent être conçus en réponse à des besoins ou désirs de leurs utilisateurs

Ils doivent fournir les éléments nécessaires à leur compréhension et utilisation

***Quel droit avons-nous de rejeter un futur
que nous n'avons pas pris la peine de penser ?***

Futur en Seine / Cap Digital, 3 avril 2017

<https://blog.futuresfestivals.com/2017-futur-seine-suivra-piste-nouvelles-intelligences/>

***L'informatique doit être
au service de chaque citoyen***

*Loi n° 78-17 du 6 janvier 1978
relative à l'informatique, aux
fichiers et aux libertés*