

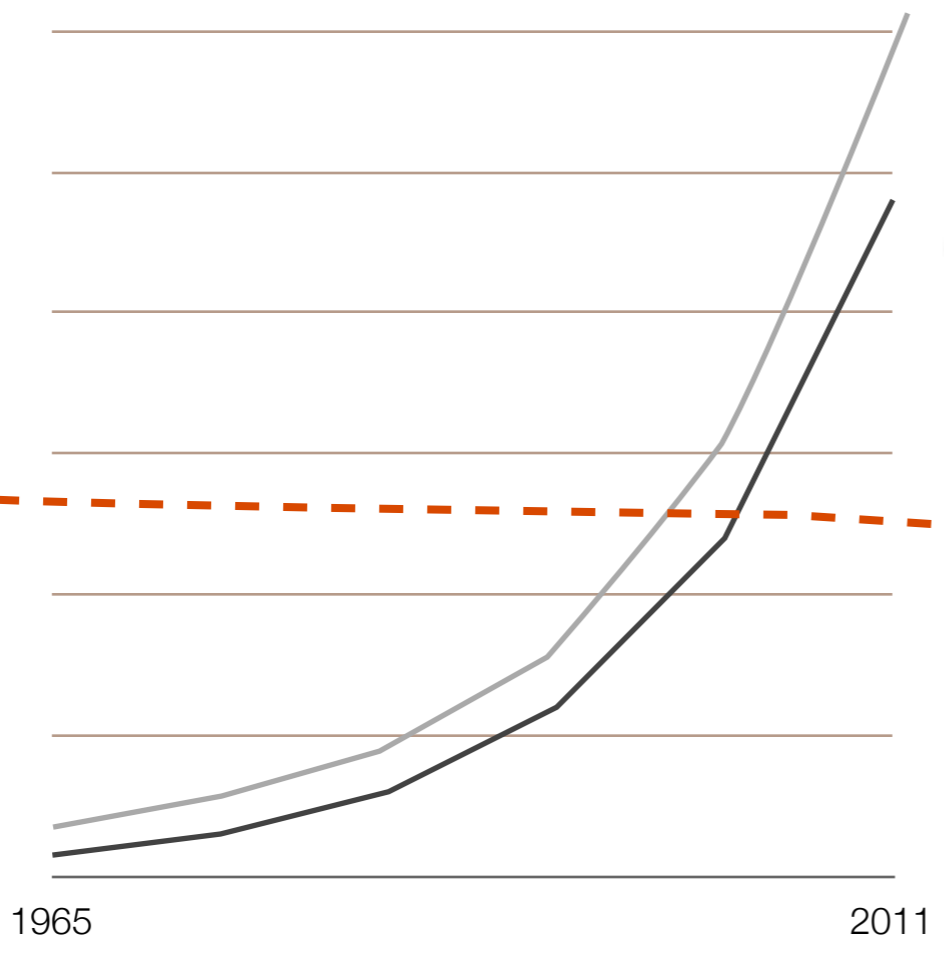
# Interaction Homme-Machine : quels grands objectifs ?

Nicolas Roussel

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Equipe MINT, INRIA Lille - Nord Europe

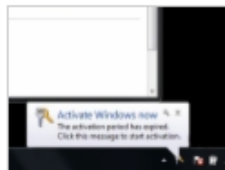
<http://interaction.lille.inria.fr/~rousseau/>  
<mailto:nicolas.rousseau@inria.fr>



**La productivité n'attend plus que vous**

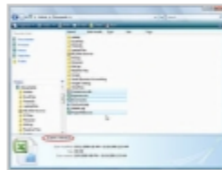
En plus des processeurs Core™ 2 Duo ou Celeron M, les portables C200 bénéficient de composants intégrés évolués, grâce au circuit graphique intégré des chipsets 945GM et 945GM. Les C200 offrent d'excellentes performances : jusqu'à 2 Go de mémoire DDR2 à 553 MHz et des capacités multimédias exceptionnelles grâce aux contrôleurs audio et graphique Intel intégrés. Et leur écran large XGA de 15" garantit un confort visuel exceptionnel, aussi bien pour vos loisirs que pour travailler.





### How to Activate Windows 7

When you buy a copy of Windows 7 in a shrink-wrapped box, you're allowed to install it on one — and *only* one — PC. To ensure that you stick to that guideline, you're required to activate Windows 7 within [MORE...]

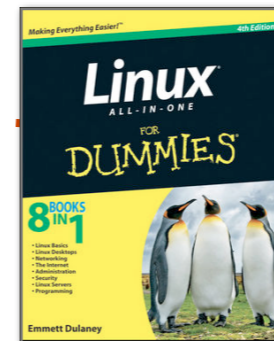
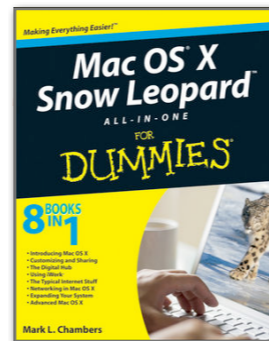
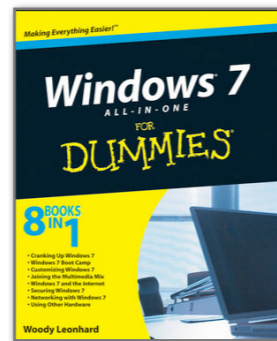


### How to Move or Copy Files to Another Folder

Moving files and copying files to another folder are straightforward operations. When moving a file, you delete it from its original location. When you copy a file, you duplicate it in another location [MORE...]

### Understanding the Windows 7 Easy Transfer Feature

The Windows 7 Easy Transfer feature makes transferring settings and data files between two computers easy. You can use the Windows 7 Easy Transfer feature to send files from one computer to another or even [MORE...]



### How to Start Up Your Mac

Before you can use your Mac, you obviously have to start it up. Here's the simple way to start up your Mac — the way you'll probably do it 99 percent of the time: Press the power button. [MORE...]

### Knowing What You Can Do with iMovie

iMovie provides the basic, no-frills editing tools you need to put together a movie from a set of video clips. You can navigate freely from scene to scene, and save your edits and changes in digital format [MORE...]

### Figuring Out What iDVD Is All About

DVD is the medium of choice for movies, having replaced videotape in the last few years. DVD stands for *Digital Versatile Disc* (not digital video disc, which is an older medium that has since bought the [MORE...])



*Science finds, Industry applies, Man adapts*



# *A software design manifesto*

M. Kapor, 1990

The great and rapid success of the personal computer industry over the past decade is not without its unexpected ironies. What began as a revolution of individual empowerment has ended with the personal computer industry not only joining the computing mainstream, but in fact defining it. Despite the enormous outward success of personal computers, the daily experience of using computers far too often is still fraught with difficulty, pain, and barriers for most people, which means that the revolution, measured by its original goals, has not as yet succeeded.

(...)

There is a conspiracy of silence on this issue. It's not splashed all over the front pages of the industry trade press, but we all know it's true. Users are largely silent about this. There is no uproar, no outrage. Scratch the surface and you'll find that people are embarrassed to say they find these devices hard to use. They think the fault is their own. So users learn a bare minimum to get by. They underuse the products we work so hard to make and so don't help themselves or us as much as we would like. They're afraid to try anything else. In sum, everyone I know (including me) feels the urge to throw that infuriating machine through the window at least once a week. (And now, thanks to recent advances in miniaturization, this is now possible.)

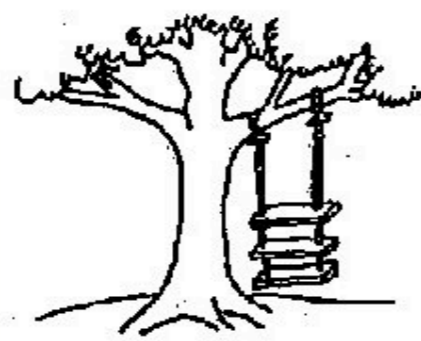
The lack of usability of software and the poor design of programs are the secret shame of the industry. Given a choice, no one would want it to be this way. What is to be done? Computing professionals themselves should take responsibility for creating a positive user experience. Perhaps the most important conceptual move to be taken is to recognize the critical role of design, as a counterpart to programming, in the creation of computer artifacts. And the most important social evolution within the computing professions would be to create a role for the software designer as a champion of the user experience.

By training and inclination, people who develop programs haven't been oriented to design issues. This is not to fault the vital work of programmers. It is simply to say that the perspective and skills that are critical to good design are typically absent from the development process, or, if present, exist only in an underground fashion. We need to take a fresh look at the entire process of creating software—what I call the software design viewpoint. We need to rethink the fundamentals of how software is made.

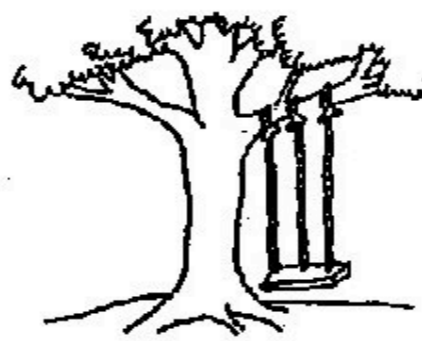
## *The Case for Design*

What is design? What makes something a design problem? It's where you stand with a foot in two worlds—the world of technology and the world of people and human purposes—and you try to bring the two together. Consider an example.

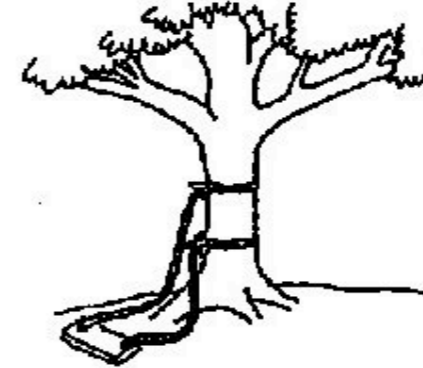
Architects, not construction engineers, are the professionals who have overall responsibility for creating buildings. Architecture and engineering are, as disciplines, peers to each other, but in the actual process of designing and implementing the building, the engineers take direction from the architects. The engineers play a vital and crucial role in the process, but they take their essential direction from the design of the building as established by the architect.



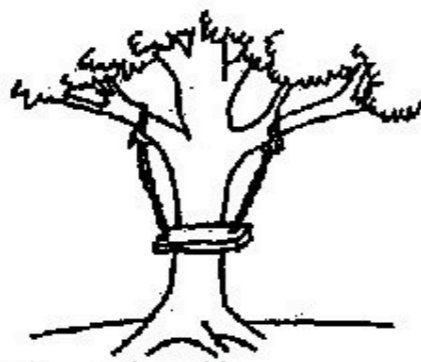
As proposed by the project sponsor.



As specified in the project request.



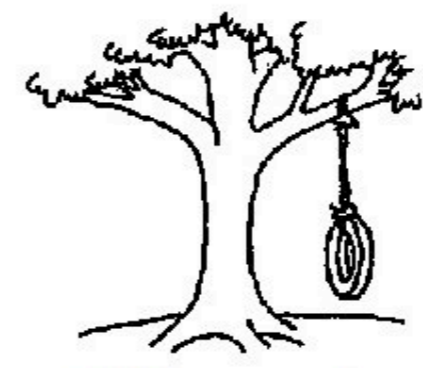
As designed by the senior analyst.



As produced by the programmers.



As installed at the user's site.



What the user wanted.

*Building systems which are correct with respect to given requirements is the main challenge for all engineering disciplines*

J. Sifakis, 2008

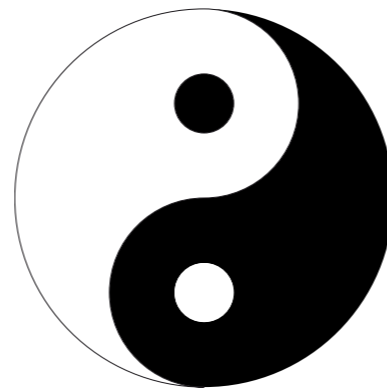


**dmonniaux** David Monniaux

Et d'un point de vue philosophique, le problème de l'informatique c'est souvent que l'utilisateur ne sait pas ce qu'il veut.

L'homme est  
imprécis,  
désorganisé,  
inattentif, émotif,  
illogique

La machine est  
précise, ordonnée,  
imperturbable,  
sans émotion,  
logique



L'homme est  
créatif, flexible,  
attentif au  
changement,  
imaginatif, capable  
de s'adapter au  
contexte

La machine est  
stupide, rigide,  
insensible au  
changement, sans  
imagination,  
contrainte au  
respect de  
procédures figées

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

Don Norman, 1993





# *L'Interaction Homme-Machine (IHM)*

## La science de l'interaction

- ▶ pas la science des interfaces
- ▶ l'interaction en tant que phénomène socio-technique
- ▶ l'interaction en tant que phénomène co-adaptatif
- ▶ une approche pluridisciplinaire (e.g. informatique, psychologie, sociologie, design, art, électronique, automatique)

## Objectifs généraux

- ▶ *comprendre* le phénomène : le décrire, l'expliquer, l'évaluer
- ▶ *innover* : proposer de nouvelles formes d'interaction
- ▶ *guider* : intégrer les connaissances et le savoir-faire dans des théories, méthodes et outils

## *La recherche en IHM en France et dans le monde*

En France : une communauté principalement académique et universitaire

- ▶ Orsay, Grenoble, Toulouse, Lille, Poitiers & Montpellier, entre autres
- ▶ une conférence : IHM, créée en 1989
- ▶ l'Association Francophone d'Interaction Homme-Machine, créée en 1996

Dans le monde : SIGCHI est le deuxième SIG de l'ACM

- ▶ conférence CHI créée en 1982 : 2400 participants, 1540 soumissions
- ▶ une communauté à la fois académique et industrielle

Quelques conférences à venir

- ▶ CSCW (ACM) : Hangzhou (Chine), du 19 au 23 mars 2011
- ▶ CHI (ACM) : Vancouver (Canada), du 7 au 12 mai 2011
- ▶ UIST (ACM) : Santa Barbara (Etats Unis), du 16 au 19 octobre 2011
- ▶ IHM (AFIHM) : Nice - Sophia Antipolis, du 24 au 27 octobre 2011

## *Mes (principaux) thèmes de recherche*

### Communication médiatisée

- ▶ usages de la vidéo pour la coordination, la communication ou la collaboration
- ▶ nouvelles formes de communication

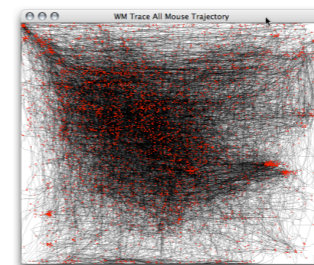
### Environnements graphiques interactifs

- ▶ évolutions, améliorations, extensions de la métaphore du bureau
- ▶ interaction tactile et gestuelle

# Comprendre l'interaction : la décrire, l'expliquer, l'évaluer

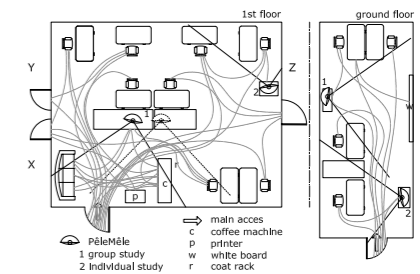
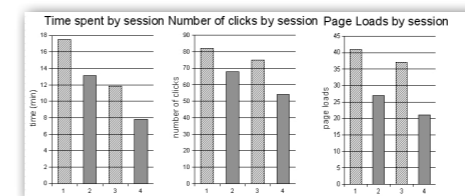
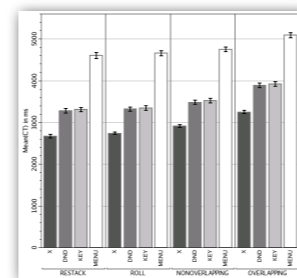
## Décrire l'interaction

- ▶ observation directe
- ▶ instrumentation
- ▶ *sondes technologiques*
- ▶ expositions grand public

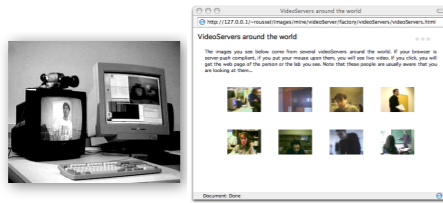


## Expliquer l'interaction, l'évaluer

- ▶ expériences contrôlées
- ▶ quasi-expériences
- ▶ études longitudinales



# Innovate : proposer de nouvelles formes d'interaction



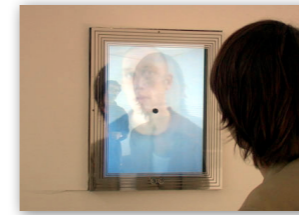
Web-based mediaspaces  
1997 - 2000



Le puits  
1999 - 2002



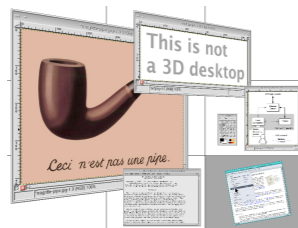
VideoProbe  
2003



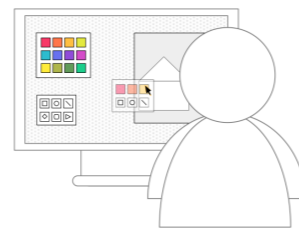
MirrorSpace  
2004



Pêle-Mêle  
2006 - 2008



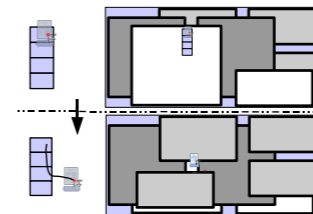
Metisse  
2000 - 2010



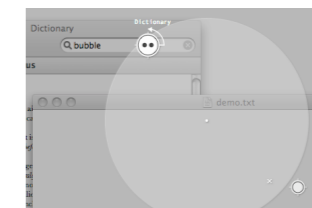
User interface façades  
2006



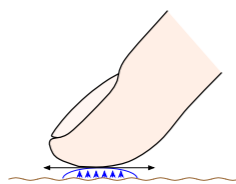
Restack & roll  
2007



PowerTools  
2008



UImarks  
2010



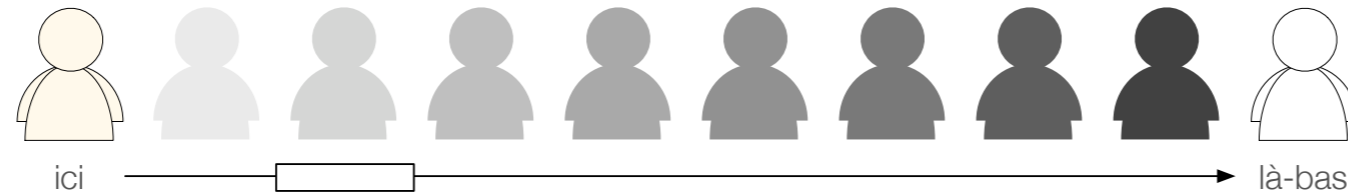
STIMTAC  
2010/11



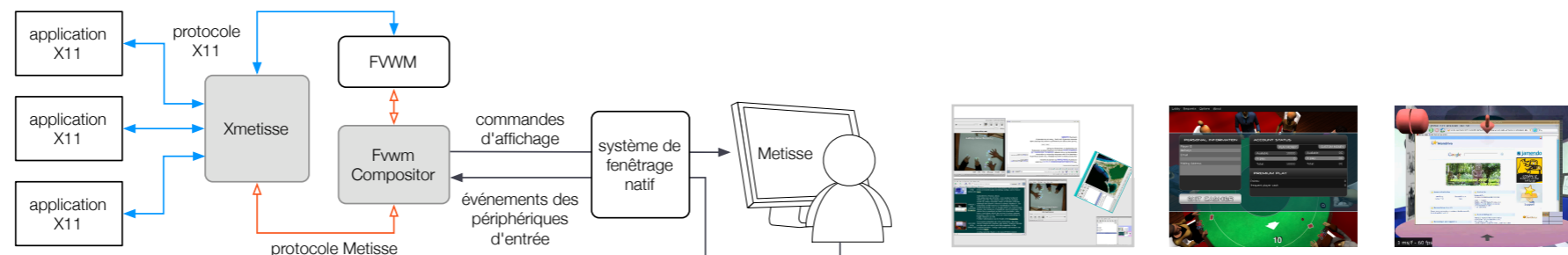
Surfpad  
2010/11

# Guider : intégrer les connaissances et le savoir-faire

La communication multi-échelles : une théorie intégrative et générative



Metisse : un système de fenêtrage dérivé de X Window



# *Interaction tactile et gestuelle*



Wii remote (Nintendo, 2006)



iPhone (Apple, 2007)



Surface (Microsoft, 2008)



iPad (Apple, 2010)



Kinect (Microsoft, 2010)

## *Interaction tactile et gestuelle*

Une nouvelle manière d'interagir ?

Un changement de paradigme ?

Une interaction intuitive, naturelle ?

Une interaction plus directe ?

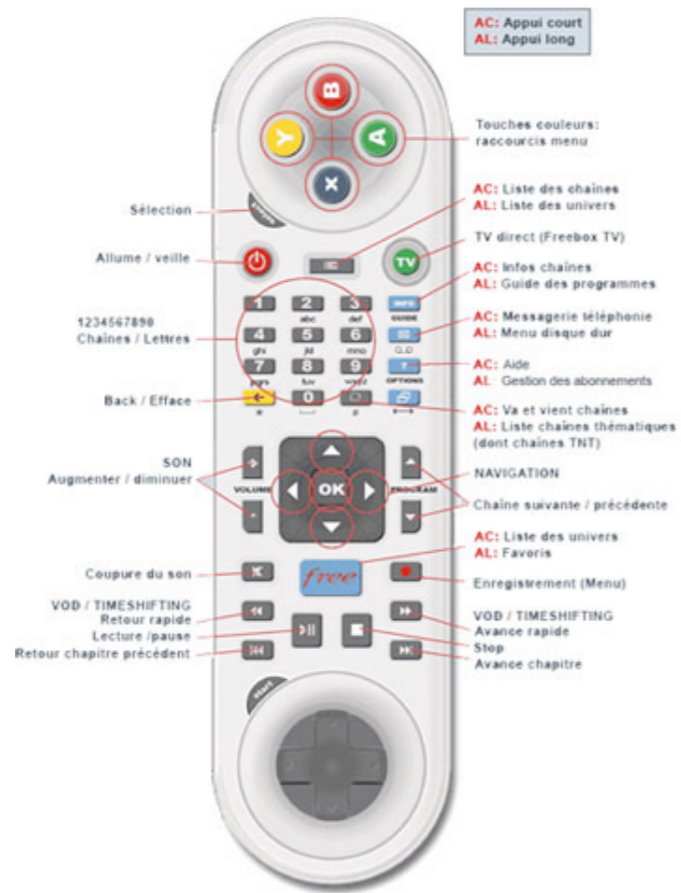
Une interaction plus simple



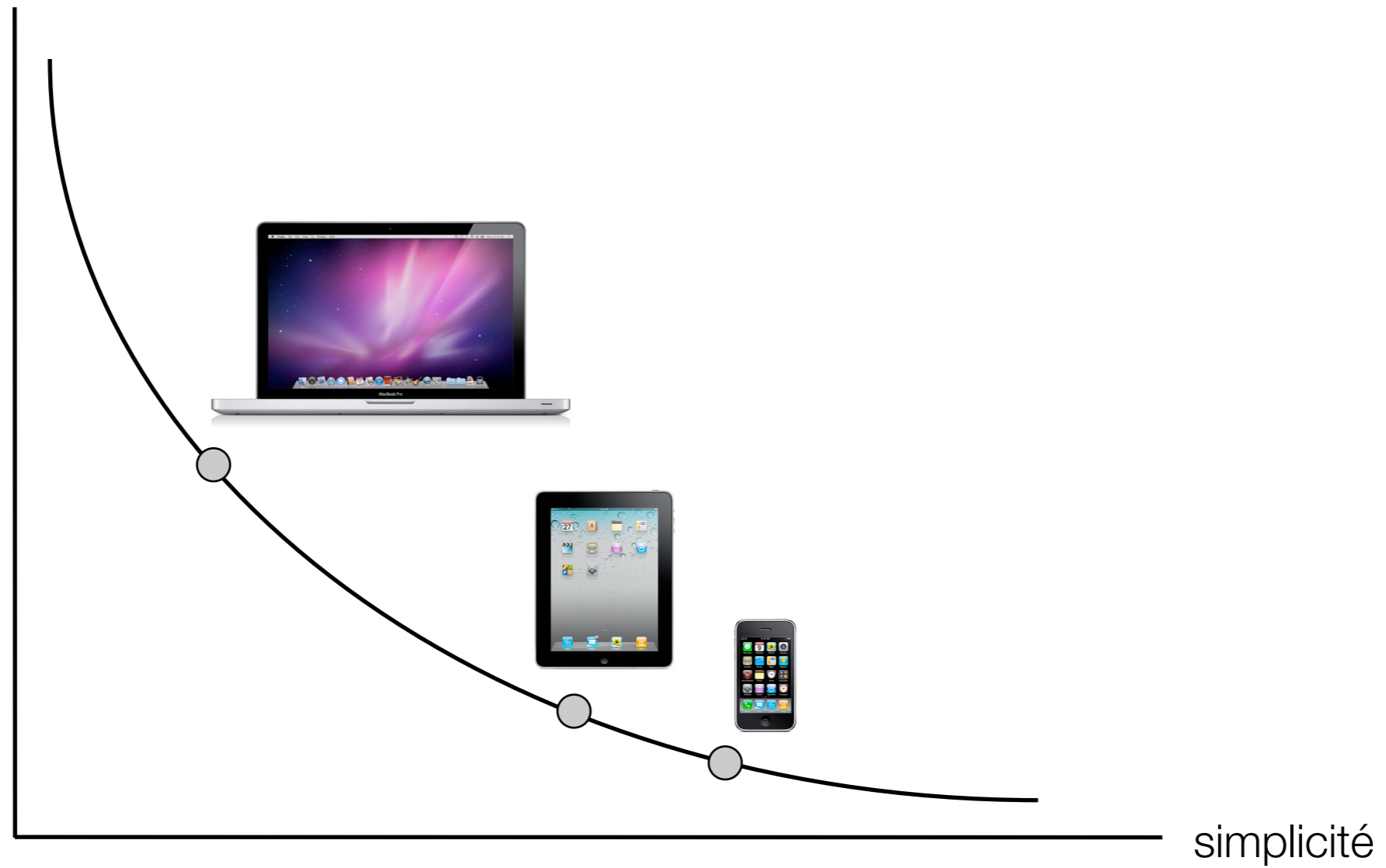


74 000 mails  
26 000 documents texte  
90 000 images  
3 300 vidéos  
1 000 présentations





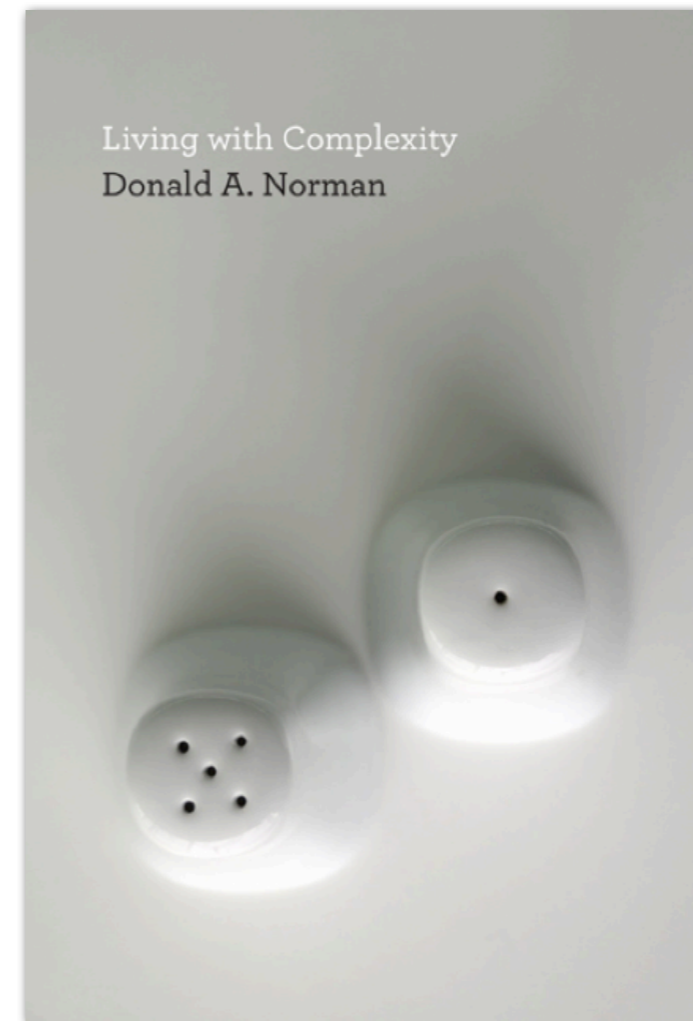
puissance



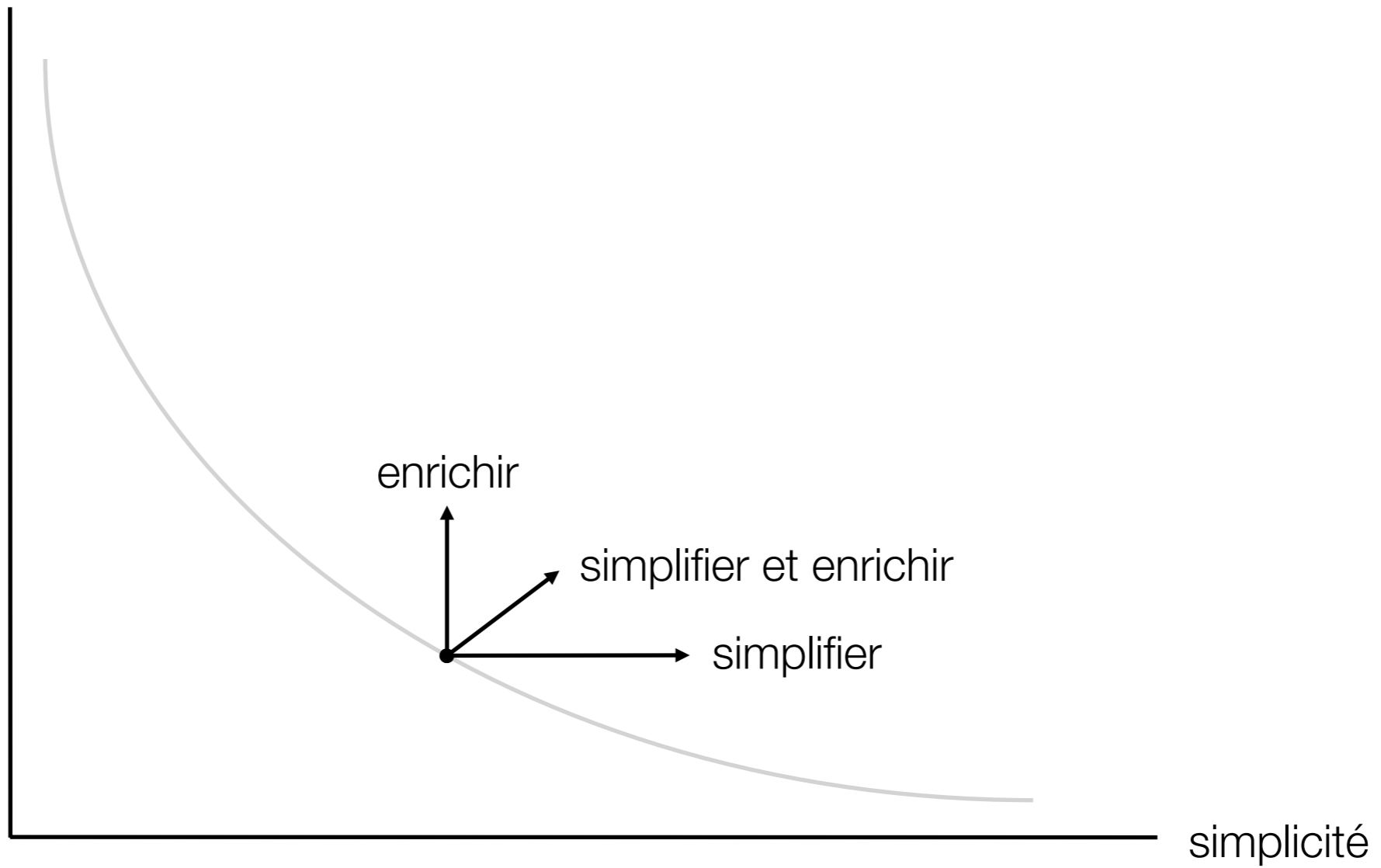
simplicité

I use the word “**complexity**” to describe a state of the world. The word “**complicated**” describes a state of mind. (...) **In attempting to reduce the frustrations caused by the complicated nature of much of today’s technology, many solutions miss the point. It is no great trick to take a simple situation and devise a simple solution. The real problem is that we truly need to have complexity in our lives.** We seek rich, satisfying lives, and richness goes along with complexity.

[http://www.jnd.org/dn.mss/living\\_with\\_complexity.html](http://www.jnd.org/dn.mss/living_with_complexity.html)



puissance



enrichir

simplifier et enrichir

simplifier

simplicité

*L'IHM est la science de l'interaction,  
pas celle des interfaces*

*La loi de Moore s'essouffle, et c'est  
une très bonne nouvelle*

*L'IHM a un rôle important à jouer,  
non pas pour simplifier, mais pour  
embrasser la complexité*

*By augmenting man's intellect we mean increasing the capability of a man to approach a complex problem situation, gain comprehension to suit his particular needs, and to derive solutions to problems*

Doug Engelbart, 1962