

Keynote Talk

Are Gesture-based Interfaces the Future of Human Computer Interaction?

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Abstract

The historical evolution of human machine interfaces shows a continuous tendency towards more physical interactions with computers. Nevertheless, the mouse and keyboard paradigm is still the dominant one and it is not yet clear whether there is among recent innovative interaction techniques any real challenger to this supremacy. To discuss the future of gesture-based interfaces, I shall build on my own experience in conceiving and launching QB1, probably the first computer delivered with no mouse or keyboard but equipped with a depth-perceiving camera enabling interaction with gestures. The ambition of this talk is to define more precisely how gestures change the way we can interact with computers, discuss how to design robust interfaces adapted to this new medium and review what kind of applications benefit the most from this type of interaction. Through a series of examples, we will see that it is important to consider gestures *not* as a way of emulating a mouse pointer at a distance or as elements of a “vocabulary” of commands, but as a new interaction paradigm where the interface components are organized in the user’s physical space. This is a shift of reference frame, from a metaphorical virtual space (e.g. the desktop) where the user controls a representation of himself (e.g. the mouse pointer) to a truly user-centered augmented reality interface where the user directly touches and manipulates interface components positioned around his body. To achieve this kind of interactivity, depth-perceiving cameras can be relevantly associated with robotic techniques and machine vision algorithms to create a “halo” of interactivity that can literally follow the user while he moves in a room. In return, this new kind of *intimacy* with a computer interface paves the ways for innovative machine learning approaches to context understanding. A computer like QB1 knows more about its user than any other personal computer so far. Gesture-based interaction is not a mean for replacing the mouse with cooler or more intuitive ways of interacting but leads to a fundamentally different approach to the design human-computer interfaces.

Categories & Subject Descriptors: H.5.2 User Interfaces (D.2.2, H.1.2, I.3.6)

General Terms: Design, Human Factors.

Bio

Frédéric Kaplan worked ten years as a researcher in Sony Computer Science Laboratory in Paris. Since 2006, he leads a research group at the CRAFT laboratory at EPFL in Switzerland focusing on interactive furniture, robotic objects and novel interfaces. He also founded OZWE, a spin-off of this laboratory commercializing new kinds of computers. He is the author of about 100 scientific articles and several popular science books. His robots and interfaces have been exhibited in several museums including the Centre Pompidou in Paris and the Museum of Modern Art in New York. His website is <http://www.fkaplan.com>