Visualizing strategy, or sketching in hardware for the first time

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Abstract

The following text is largely based on an academic project that was realized between November 2008 and January 2009. The theme of the overall project was "Complex interactions in a specialized environment" and it was conducted in partnership with Komatsu Forest AB and IDEO Munich. The goal of the project was to rethink the (very numerous) interactions that are happening between a wood-logging harvester, it's operator and the forest. Through extensive research and a total of three days spent on the field, I chose to mainly work on the operators' visual cognition.

Keywords

simplicity, low-tech, hardware sketching.

The illusion of designing interaction

As much fun as technology is, I think we should of course integrate it throughout the whole design process. However, if we do not want to risk being ourselves drowned in this sea of technology, it is mandatory that it should not be our main focus.

In an era where progress is often measured rather than appreciated—or in other words, judged by the quantity added features versus the quality of the experience—, it is my belief that as interaction designers, we should thrive for easing people's dialogue with technology. This, as I understand it, has much to do with the illusion of designing interaction.

Visualizing strategy—the project

The working environment of wood-logging harvester operators is one that can be qualified as complex if not complicated. As an example that demonstrates that complexity, let's only mention that these operators have in each hand a joystick (on which lie numerous buttons and knobs) that triggers an astounding 35 different functions! And not only are they constantly manipulating these, but within only a few seconds, they have to take an impressive amount of very important decisions concerning numerous things that are not even close to be related to the process of cutting a tree. An experienced operator can cut about three trees per minute; in other words, everything goes fast, extremely fast. In the context of a project concerning a person that works in such an intense environment—namely a wood-logging harvester—, and knowing that the main priority of the whole forestry industry (including the operators), is to increase productivity, one of the interaction designer's duties is to obviously allow that, but furthermore creating a more efficient if not more enjoyable working environment for these operators.

Figure 1. In a Valmet 941.1 wood-logging harvester, the operator looks at two things: the forest and his computer screen. On the computer screen is displayed all sorts of information concerning, amongst others, the trees (length, specie, assortment, etc.), price lists, maps, and machine settings.

The basic idea behind the 'Visualizing strategy' project is to get as much tree-related information into the forest—therefore away from the screen so that the operators can truly focus on their subject: the forest.

Before going into further detail regarding the actual concept, one has to bear in mind that due to limitations in time I have only developed in depth the micro aspects of the project: namely, an 'interface-in-action' that allows the operators to constantly keep their eyes in the forest (whereas actually, they constantly look at their screen to verify, amongst others, measurements, tree quality and specie).

Also, a critical aspect of the development of the project was to thrive for simplicity—which was in fact a self-imposed modus operandi. I tried to apply these "principles of simplicity" in: the interaction effectiveness, the visual language and the technologies I used.

Reducing by augmenting
Even if the above statement seems contradictory, while I was developing my project, it made perfect sense to me. Indeed, I figured that with my simple, low-tech approach that made use of lasers as a means of displaying information, I was if fact truly—even if crudely—augmenting reality.

I was also reducing the quantity of displayed information to the essential: the information regarding the tree specie, quality as well as a number of dots that would indicate (if there would be five of these dots) five different options to cut a log to length.

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All of the above information would be displayed directly on the tree trunks, with a very low-tech technology —the laser— hence my concept of interface-in-action.

Discreet choice
Another interesting thing to mention with the use of true augmented reality by means of projecting lasers beams directly onto the tree trunks (namely, having five 'dots' and a line displayed on the tree trunk) is that, contrary to the actual system which consists in the operator having to move the cutting head of his harvester approximatively to the desired location (with a pressure-sensitve knob), the operator is now discreetly indicating the exact location where the saw will cut the tree. This approximation is completely absent with my approach, for the operators need only to be pressing a single button (x number of times) depending to which 'dot' they want to move the cutting head to, hence providing a discreet input to their machine.

Furthermore, all the information needed to cut the logs to length is, as previously mentioned, displayed directly on the tree. In other words, this means that the operator, once he has set his personal preferences (e.g. the spacing between the dots that are displayed on the tree, the number of dots, etc.) would been able to constantly keep his eyes in the forest. Another interesting aspect of using such a 'low-tech' technology is that while lasers are being projected into the forest and onto the tree trunks, it means by implication that these very lasers are in fact (crudely) augmenting reality. In other words, a rather nice feature (that allows the interface to be displayed where it should be) that is often perceived as futuristic effect is achieved in a very simple manner.

Adding content does not necessarily add meaning

Simplicity... in prototyping
The term sketching, since Bill Buxton published his book , seems to have taken a much broader and more holistic meaning. It does not solely mean sketching with a pencil on a white sheet of paper anymore and that is especially true —and quite recomforting—in interaction design. Sketching, according to Buxton is, simply said, prototyping (traditional sketches, photographs, sculpture, simple electronics, etc.) numerous ideas rapidly in order to give the designer a broad range of possibilities to choose from.

As interaction designers, if we wish to not only design an illusion of interaction, but actually prototype it, it then becomes relevant to dive into the process of programming.

"Code has a major influence on design, and I think it is too important to anonymous engineers"

Building crude physical prototypes that (can) involve programming and electronics proves to indeed be an utmost hands-on method and approach to try out ideas in a relatively rapid manner. Hardware sketching—as opposed to CAD modeling or video compositing—even for a total neophyte like myself, proves to be an utterly tangible way of truly experiencing a 'design'. Not only can one see, touch or hear a prototype of that design, but can also witness, and more importantly, feel the effects and behaviors of their design.
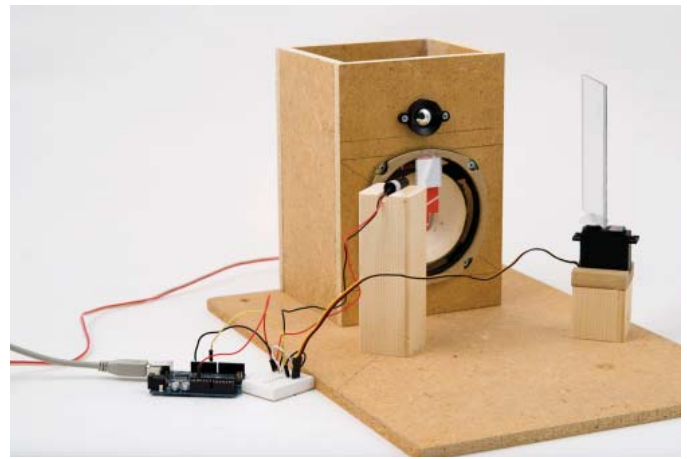
Figure 2. The final prototype of my project. It was used to validate the concept of projecting lasers.

Final words
Interaction design, when considered the other way around—that is, the design of interaction—then has an arguably different meaning. In other words, it becomes more tangible—and intelligible! More intelligible because, at least from a linguistic standpoint, the 'design of interaction' is a more concrete concept than the term 'interaction design'. Moreover, the design of interaction(s) is more revealing as to what it is that an interaction designer does: he or she designs interactions—or to use a more popular term, experiences.The interaction designer needs tools to verify, prototype, test out his or her ideas. It appears that hardware sketching is a great way to do so, partly because of it's efficiency in communicating a better idea and feeling—to the end-user as well as the designer—of the final 'experience' or interaction of what is being designed.

References
Komatsu Forest is the owner of Valmet. At least when compared to head-up displays, multi-touch screens, eye-tracking and other such technologies.

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