New Human Computer Interaction Trends

Focus on User Experience

Created by Dr Stavros Asimakopoulos

for the www.forecastingnet.com

July 2012

Dr Stavros Asimakopoulos is Director of User Experience at Experience Dynamics, a leading usability consulting firm providing global design research services. Formerly, a Lecturer of UX, he has over 8 years of experience in user research, forecasting software design improvements, and management of UX projects. He is an active member of the British Human-Computer Interaction group and regularly presents his work at the International Symposium on Forecasting. You can reach him via email at: stavros@experiencedynamics.com

A usual day…

You are walking on the street, en-route for meeting your girlfriend. You are late and should have already made reservations for lunch. Disaster? Not really! Your sunglasses-your latest gadget-takes care of everything: spotting the closest Italian restaurant-your girlfriend loves Italian cuisine, making reservations on-line and giving directions to you and your girlfriend-you both bought the same pair! One more thing to take care of and everything should be in order. You instruct your sunglasses to send a message that you will be a few minutes late. You still haven't used to actually talk to your sunglasses, but heck that might be the normal way of doing things soon. Lunch is over now and you should get back to work. You really like the new screen they set up in your office lately. It's like what Tom Cruise used in Minority Report. Just point and click, but without actually clicking on anything. You just use gestures to control what's happening on screen and talking at the same time instead of typing. It was about time to get rid of that clumsy keyboard. It was a thing of the past…

If you think that all of this is Science Fiction, then welcome to the future of Human Computer Interaction…

The future of HCI

Imagine a world where you can receive information that is relevant to you, your family, and your business, in real-time, based on your interests, activities, or desires. Now, imagine that this could also be filtered by your current location and accessed through your smartphone or tablet PC, your smart TV, your car, or even your glasses.

Science Fiction? Not at all. All the future technologies for smarter, simpler, and better human computer interaction are already here, waiting to get standardized and go mainstream. Most major IT and Digital equipment players are making their first moves, placing themselves strategically on the board.

Three pillars of Human Computer Interaction (HCI) are currently expanding, shaping the future of digital interaction as we speak: v*oice recognition and control*, *gesture-based interaction*, and *augmented reality* (AR). Apple, Microsoft, Google, Samsung, and practically every major high-tech player in the market is either launching or considering new products that make digital equipment, from smartphones to TV sets, smarter and more fun to use. And they go even further by integrating these technologies to our cars or even our glasses…

Voice recognition and control

This is actually two-fold. First, transform the user's voice into workable text (speech to text) and then understand what the user has said. The latter introduces Artificial Intelligence (AI) into the HCI domain, bringing it back to life after so many years. Apple is pioneering this with the introduction of Siri in the new iPhone 4S.

With Siri, you can literally talk to the device and perform various tasks, such as scheduling an appointment or sending an email, by using natural language. Obviously, it cannot fully replace the existing touch interface due to limitations, in terms of functionality and practicality, but it's well on track for initiating the next big thing in HCI, a completely touch-free interaction.

Gesture based interaction

It's safe to say that great attention was brought to this kind of HCI after the launch of Microsoft Xbox Kinect. One of the most successful products of Microsoft, Kinect was soon recognized as perhaps the best wireless remote implementation for games against its rivals PS3 and Nintendo Wii, even though it came in last. As Microsoft says in Kinect's website, all you need is you. It didn't get long to understand that Kinect's applications go further than gaming. The first business applications have started to appear as well and there are many that think that gesture based interaction could soon replace the mouse as the standard pointing device exactly as voice dictation could replace the keyboard. Of course, these HCI implementations, such as Microsoft Kinect, that promote touch-free, gesture-based interaction, with incorporated facial recognition, work well in living room distance. Therefore, they might not be ideal for shorter ranges, for example, in front of your PC or mobile devices. However, the recent *Near Mode* of Microsoft Kinect can open up new possibilities even for closer distances.

Augmented reality

That's a thrilling new area of HCI involving the integration of 'reality view' with digital content and action automations. There are many examples of AR but perhaps the most famous is the Google Glass project.

Google's glasses aim to do what a smartphone does, but without using the phone. Essentially, we can interact with an Android device via hand gestures, voice, or head nodes, and thus use the glasses for answering video calls, checking into places, executing voice searches, taking photos and sharing

them into G+ circles, getting walking directions, listening to music, watching videos, and much more. The Google Glass technology is a very futuristic one, not only because of its incredible capabilities, but because of its small size, compared to early prototypes of similar devices that can augment users' reality.

Layar, a mobile browser, takes the AR concept into another level by making the print world clickable. Layar accesses multiple layers of AR content through the user's smartphone camera. The Layar browser views the surroundings through an application using the camera and then displays the augmented information to the user as he or she walks around. Thus, the information appears real time-even though it is not-as the software accesses multiple "layers" of data provided by developers, content providers, or printed media creators.

People may not fully depend on smartphones in the future as they have small screens. Hence AR capable contact lenses and glasses (e.g. Google Glasses) are more likely to take up the market sooner or later as they provide users with a better viewing experience. From a user experience point of view, AR coupled with Artificial Intelligence might be able to reduce the barrier between humans and electronic devices by providing additional useful information and improving our perception of the real world.

A special note about Samsung

Samsung is one of the largest manufacturers in the world of digital consumer equipment and the second largest smartphone manufacturer behind Apple. Its brand new Galaxy S III smartphone is considered by many as one of the best Android implementations in the world. S-voice, released by Samsung exclusively on the Samsung Galaxy S III, allows users to do certain tasks through voice that can ordinarily be accomplished by using their fingers.

But Samsung has one particular advantage that Apple doesn't have- at least for now: a huge audience coming from its successful consumer electronics division including home theaters, TVs, and other digital equipment. The new Samsung Smart TVs, incorporate some of the hottest HCI trends mentioned before, including voice, gesture control, and face recognition. It seems that Samsung has all the necessary technologies in place and the right audience, too. On the other hand, Apple, even after Android's successful launch, still has the most applications in its App store and rumor has it that the new Apple TV-a real TV set, not the media player-is under way, and could be launched as early as next year.

User Interfaces trends to watch out in the future

Integrated voice control: Intel has announced a partnership with Nuance, which is expected to bring voice control to laptops. According to reports, the voice control will be built into the computers and will be able to learn users' accents.

Smart cars: New HCI trends-especially augmented reality-will capture the interest of many car manufacturers in their attempt to differentiate their offering. GM is experimenting with AR technology for backseat passengers and other manufacturers are expected to follow with offerings including games, location based services, or even accident prevention systems.

Smart TVs: more and more TV manufacturers will follow Samsung's lead unveiling products featuring voice and motion control. Samsung announced Smart TVs featuring both, along with facial recognition. TV manufacturers Lenovo, LG, and Samsung are all promising gesture and voice interfaces as replacements for TV remotes.

New Apple TV: Apple is also widely expected to unveil a Siri-controlled TV next year. This, unlike the current Apple TV, will be a real TV set-not a media player-that will communicate seamlessly with all Apple appliances and readily access available content. If successful, this will allow Apple to penetrate the consumer electronics market and change it forever.

Microsoft Windows 8: Microsoft sees its Metro UI (tiled visual touchable Windows 8 interface) as a key solution for cross-device user experience. It is also Microsoft's latest attempt to penetrate the mobile devices market after several unsuccessful tries.

3D mobile interfaces: Moreover, in the mobile area, 3D mobile interfaces are heating up. Apple is exploring a motion-based 3D user interface for iPhone as a new UI direction. Down the same road is Samsung's early release of the TouchWiz 3D mobile UI as well as HTC's new Evo 3D interface.

What's next?

These are the early days of natural user interfaces for products and services, and we're going to see a lot of experimentation and more systematic user research invested in it. Technology aside, the factor that will clearly determine success and effectiveness of the new UI approaches will be the actual user experience and the feeling derived from it. The key fundamental design principles that will allow a successful user experience are: ***focus on the user task*** quickly and easily, ***flexibility*** to allow users to have a seamless visual experience as they switch between different devices, ***effortlessness*** by keeping the look simple, clean and consistent, and, finally, ***emotional engagement*****.**

With tons of ideas, experimentation, and technologies going around, it seems that, in the near future, more things around us will slowly be replaced by touch-free interaction. We keep on innovating to create new concepts that help us accomplish tasks in a better, faster, more efficient way, and that's the reason technology is important. UI developed with these design principles and approaches will definitely be able to generate a much broader intelligent class of system responses with a "touch" of AI. Moreover the entire system will assist as cooperative partner to the users in accomplishing their intended tasks.

This future will become even more exciting if UI and relevant products get to the core of human nature, encompassing social and business interaction, through all media of communication, from written or spoken language to gestures and facial or conversational emotions, and respond accordingly.

Which brings to my mind, the famous Aristotle's quote in Politics who argued:

'Man is by nature a social animal; an individual who is unsocial naturally and not accidentally is either beneath our notice or more than human.'

So, once again welcome to the future!