Three Wishes for the Future of Devices

Within the last 80 years (if we take the first digital computers in the late 1930s as a starting point), we have gone from poorly performing, huge machines spread over entire rooms to high-performing, almost weightless devices not much bigger than a human adult's hand.

The last 40 years have been particularly eventful: from the digital computers using punch cards that my parents worked with during their higher education to my current flat, super-light laptop. By the way, do I even still need a laptop?

UPCOMING ISSUES

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Changing Health Care

Article deadline: December 1, 2019

Nowadays laptops are being discarded in favor of tablets. Most of them are usually lighter, have a longer battery life, and have a screen that is bigger than many laptops. Then there is the smartphone, on which I can now perform almost all my work tasks while on the move (or discreetly during a lecture). My smartphone does not quite replace my laptop (I still prefer my laptop's 13-inch screen to carry out the bulk of my work) and it does not (yet) replace my iPod (I am not yet on Spotify), but it provides me with incredible flexibility and freedom.

Having reached this unprecedented level of comfort—constantly having the entire world at our fingertips—what does the future of devices still hold for us? In spite of the incredible technological achievements that have taken place, I have a three wishes for the future.

LONGER AUTONOMY

My first wish for the future of devices is longer autonomy. I am looking forward to the day when I will not need to walk around with my charger in my backpack. I was

ridiculously happy to have found a laptop weighing one kilogram (or 2.2 pounds). As it happens however, I seldom have the opportunity to enjoy this weightlessness because my comparatively heavy charger almost always has to follow. If only I could leave it behind without fearing to be out of battery power in the midst of my work. This would also mean I would be freed from the need to find an available power socket everywhere I go. I am sometimes afraid of the extent to which this dependence on power sockets dictates my behavior in public places: It determines where and how I sit, often making me choose spots I would normally disregard had I not had to worry about battery life.

My smartphone is a bit better in this regard. It can go for several days without being recharged, but I still need to drag my charger around with me when I am going away for longer than a workday. This is also true for my iPod and my tablet. As such, when going away to a conference, for example, I always have to make sure I have packed (1) my laptop charger, (2) my smartphone charger, (3) my iPod charger, and (4) my tablet charger. So, using these devices is easy, enjoyable, even empowering at times, but ensuring they remain functional can be quite cumbersome. In the future, I hope to be able to leave my cables home, and stop worrying about seeing the “battery level critically low” warning sign popping up onto my screen(s).

INCREASED SECURITY

Cloud computing, internet of things, self-driving cars...these trendy topics have, from my perspective, at least one thing in common. They can potentially cause huge security, safety, and privacy issues. For instance, the data I have stored on the cloud could be stolen or made public. The digital devices I have at home could be used to spy on me (e.g., laptop camera) or create chaos in my home and for my neighbors if all smart devices are switched on at the same time. Cyber attackers could invade our digital space and take control of our devices. Self-driving cars could be made to cause damage to other cars or other people.

As such, while we are currently us-

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ing an increasing number of “connected” devices in our everyday life to make things easier, it seems we are more and more vulnerable to potentially serious negative effects—not only for ourselves, but society at large. Another troubling aspect is that of skills and competence. By handing over more and more tasks to machines, we are losing the ability to carry out these tasks ourselves. Once we have stopped learning how to drive, what will happen if some day our self-driving cars stop responding?

In light of these issues, my second wish is increased security, with a broad understanding of the term. I do not only want access to our data and devices to be better protected, but I also want to see the development of devices that assist us instead of simply “taking over” our daily tasks. Technology should enable us to achieve more, not less.

BETTER SUSTAINABILITY

At the beginning of this text, I gave a quick overview over the fast-paced evolution of computing technology and devices. Although I consider this technological (r)evolution as globally positive—it has, after all, greatly increased our quality of life, at least

in developed countries—it seems indisputable that its environmental track record is far from satisfactory. The downside of our insatiable consumption of new technological gadgets has been the over-exploitation of some natural resources, as well as the production of a huge amount of material waste that our earth cannot absorb. There is also a range of ethical issues regarding the making of technological devices, specifically the working conditions and health of the workers assembling them.

Therefore, my third wish for the future of devices is better sustainability. I want the (near) future to bring us eco-friendly and ethical ways to produce and consume technology. There already are some attempts at producing “fair” devices (such as the Fairphone), but more is needed, especially when it comes to the recycling of old (or obsolete) digital tools.

Will my three wishes—longer autonomy, increased security, and better sustainability—come to realization in the near future? This issue should provide us with the beginning of an answer. What aspects of computing technology are researchers within academia and industry currently trying to develop further? What are the technological challenges that need to be overcome in order to develop a new generation of devices?

Our guest editor Zengwen Yuan, a Ph.D. candidate in computer networking at UCLA, and XRDS feature editors Apoorva Bhalla and Henri Maxime Demoulin have done fantastic work in bringing together a rich set of feature articles addressing these questions and more. Maybe you will become inspired to contribute to the devices of tomorrow?

—Diane Golay

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