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How computing is likely to have developed by 2030

Emma James · Thursday, March 18th, 2021

The history of computing is a story of constant innovation and progress. Yet today's computer still runs along broadly the same principles as those outlined by Charles Babbage in 1822, and later Alan Turing in 1936. What has changed is the capability of the computer, in terms of power, speed and connectivity. While working on principles that were essentially understood over a hundred years ago, computers now have a processing ability and functionality unimaginable by those early pioneers.

Looking at a timeline of computer history, we can see that the density of significant events becomes greater as we go along. This is in contrast to most inventions, where all of the really innovative work is done early on, and later additions are merely cosmetic refinements. The difference is that computers enable their own evolution: the more powerful they become, the more problems they can solve relating to their own design, and so technical progress is constantly speeding up. With this in mind, it's possible to anticipate major changes in computer capability as soon as 2030 or earlier.

The great catch-up

Back in 2008, the futurologist Ray Kurzweill suggested that computers would be as intelligent as humans by some time in the 2020s. He further explained that once this milestone is reached, they will quickly overtake us due to their ability to instantly share knowledge between different devices, their perfect logic and recall, huge memory capacity and the fact that they are designed to be rapidly self-improving.

In many ways, computers can already "think better" than human beings, which of course is why we use them for complex calculations. In other ways though, getting computers to respond and understand with the range and subtlety of the human mind has proved more difficult than anticipated.

We may not yet be on the cusp of the "post-human" world that Kurzweill predicted, where computers would have to be recognized as an intelligent entity at least equal to ourselves and would be capable of solving our most pressing and intractable problems. But Artificial intelligence and machine learning are the areas in which computers are expected to make the most progress over the next decade.

AI for all

Artificial intelligence (AI) is already widely used in computer software and hardware, and the next few years should see it become ubiquitous. We may hear less about it because it will be taken for granted, even as it continues to improve, and our everyday devices become capable of more accurate responses and more subtle distinctions. Smartphones will get both smarter and simpler, closer to pocket computers as well as a central hub for the 'Internet of Things,' interacting with the smart technology throughout our homes, workplaces and public infrastructure.

A new kind of computer

Some are predicting even more radical developments that may completely change the way we understand computer technology. Rodrigo Liang, co-founder and CEO of computing start-up SambaNova, envisions an entirely new type of computer, one that continuously adapts to the flow of data rather than merely responding to instructions.

Rather than having fixed logic gates that direct and filter information as it's received, the physical processor will rearrange its circuits periodically in response to the data flow it encounters. Imagine a machine capable of reconfiguring its own software and hardware in real time to meet changing situations, requirements and new information. SambaNova suggests that, over the next 5-30 years, this will increasingly become the norm.

The same but better

Whether this happens or not, it's a safe bet that over the next decade, our personal computers will become better at doing the same jobs they do now. Tomorrow's PCs will almost certainly be faster, flatter, thinner, lighter and more powerful. We will see foldable displays in the form of flexible screens that can be unpacked, while portable devices like laptops and new tablets will become more like phones with better battery life. They will be designed to stay on and connected to the 5g network wherever you are.

Indeed, while Mac and Windows PCs may continue to develop along the same lines as today, more radical changes are likely to happen at lower price points. We'll see Apple's iPad OS become more of a fully-fledged computing platform, with Google further merging its Android, Chrome and Fuchsia systems to provide a similarly high level of performance.

Smart and secure

We can look forward to more future intelligence, as our computers become better at predicting our needs and actions and knowing what tasks we want to perform almost before we do. We'll be talking to our computers more as speech and natural language recognition improve. Alongside this, however, will come the need for greater security, with biometric identification used to log in and more data stored securely on the cloud.

Technology moves so fast that it's impossible to accurately predict what computers will be like even as close as five to ten years into the future. What is certain is that, by 2030, they will be even more ubiquitous and even more a part of our daily life. From the Internet of Things to quantum and biological computing, radical changes are definitely coming.

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