

Our brave new world

The visionaries

It all started 50 years ago.

Gordon Moore formulated the conjecture that the new technology of photolithography on silicon would allow increasing the component density exponentially for an indefinite number of years.

At Stanford University, two Computer Science research laboratories were opened: at one end, Douglas Engelbart devised to augment human mind by computer tools; at the other end, John McCarthy foresaw an artificial intelligence that exceeds the human one.

The gurus of the DARPA Information Processing Technology Office (J. C. R. Licklider first, Lawrence Roberts later) envisioned a global computer network that could be connected one day, wirelessly, also to personal devices.

Only a few years later, in 1973, our Stefano Rodotà published for Il Mulino "Electronic computers and social control", where he reasoned about the dangers that accumulation of personal data by computers could have represented in the future.

Back in Stanford, in the same 1973, at the Xerox Palo Alto Research Center (PARC), Alan Kay envisioned a personal device large as a book, with a graphical interface, connected to a wireless network... actually a tablet, even if the personal computer did not yet exist.

In 1974 the first World Chess Championship for computers took place, but the level of play was still mediocre. Less than 25 years later Deep Blue, a specialized supercomputer made by IBM, would have defeated the World Champion Garry Kasparov for the first time at the best of 6 matches.

50 years later...

Fast-forward to today.

Moore's law still seems to hold: everything has changed, but we are still observing an exponential growth of the power of computer systems. In addition, along with the speed increase and consumption reduction made possible by the progressive shrinking of chips, the emergence of Cloud computing systems adds further exponentially growing dimensions (number of servers, memory size, storage volume), building technological plants which rival in size with the large factories that until the last century were typical of other manufacturing industries.

The ten largest companies by capitalization all belong to the ICT sector, and each of them has its areas of competence where it has a quasi-monopoly position and is often at odds with some countries.

Not only the best chess player is a computer system since some time, but in 2017 a new system, based on neural networks, has been built which can learn chess by itself (as well as Japanese chess, shogi, and Go), starting from basic rules and nothing else. Within a few hours, it achieves the competence for beating both humans and the best chess-dedicated computers. AlphaZero, this is its name, has a very aggressive style of play, somehow "alien" according to its developer, Demis Hassabis.

Over one and a half billion humans live symbiotically with a personal computer, called "smartphone", which has a multimedia interface and a permanent connection to a global network. They depend on it for communicating with other humans, expressing their emotions or experiences, choosing where to go, eat, sleep, shop and pay, for being informed about the world

and their own community, deciding who to vote for. Most of these humans have no idea how that mysterious object works, they are surprised by its speed and ability to answer questions, and they accept uncritically everything they got from the device.

In the world of Big Data, the term “it cannot be done” to indicate a technological impossibility does not exist anymore: every datum is available in digital form, every sifting of digital data can be completed within a reasonable time, every useful correlation can be extracted sooner or later. The technological impossibility is replaced by: “it is not lawful,” “it is not [yet] economically sustainable,” “there is a law that forbids it [in some country].”

Large computer platforms are distributed in all corners of the world. They are interconnected for ensuring that the services they provide are always operating even in case of power or network outages. They consume a good 5% of the whole electricity production of the world. They are more and more a kind of autonomic systems, able to adapt independently to different circumstances (increase in load, breaking of components, catastrophic events, etc.) without human intervention, as this would inevitably be slower and less appropriate.

Artificial Intelligence (AI) systems have autonomous roles in many contexts, but even when the last decision is delegated to a human, our incompetence and slowness lead us not to question the choice given by the machine.

From autonomous vehicles to planes in the critical phases of flight, from medicine to finance, it is the law and even ethics that have more and more to do with the outcomes of AI.

The future

The visionaries' eyes sparkled, envisioning a future where we would have lived more thoroughly, where, with the help of computer science, we would have augmented our intellectual abilities.

The world we have created seems to be marginalizing a large part of humankind and to usurp our capacity of judgment. We no longer know whether we are demigods with powers never attained by previous generations, or we are ourselves goods, managed by immaterial autonomous systems more intelligent than of most of humankind.

We do not know where this world, midway between being physical or immaterial, will go; we only perceive it is going faster and faster.

This is a fundamental issue for the future; to talk about it, we would like to gather at the MIX Salon as many viewpoints as possible: we would like to compare the opinions of humanists, philosophers, historians, political experts, jurists, economists.

Rephrasing Clemenceau: [the digital world] “is too serious a matter to entrust to technologists”.



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