Fundamentals of Computer Engineering

Module I - Unit 2
The current context of Computer Sciences.

Teachers: Moisés Martínez (1ºA English)

Year: 2022 - 2023

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What do you want to be when you finish?

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Some important question.

Some important questions ….

Thinking about

What is Computer Science?

What is Computer Engineering?

What does a computer engineer do?

What does he or she need to do?

What is the work like today?

Some important questions ….

Thinking about

What is Computer Science?

The study of **computers** and **computing**, including their theoretical and algorithmic foundations, hardware and software, and their uses for processing information. The discipline of computer science includes the study of algorithms and data structures, computer and network design, modeling data and information processes, and artificial intelligence.

Thinking about

What is Computer Engineering?

Computer engineering is a branch of electrical engineering that integrates several fields of **computer science** and electronic engineering required to develop computer hardware and software.

Thinking about

What does a Computer Engineer do?

Computer engineers are involved in many hardware and software aspects of computing, from the design of individual microcontrollers, microprocessors, personal computers, and supercomputers, to circuit design. Computer engineers write **software** and **firmware** for embedded **microcontrollers**, designing **chips**, designing **analog sensors**, designing mixed signal circuit boards, designing **operating systems**, **robotic systems**, **control systems** and **AI systems**.

Why we are here?

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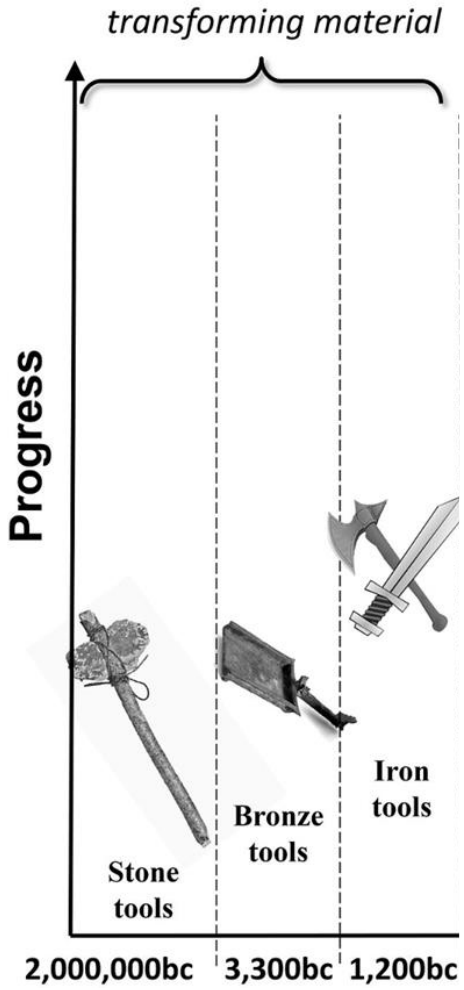

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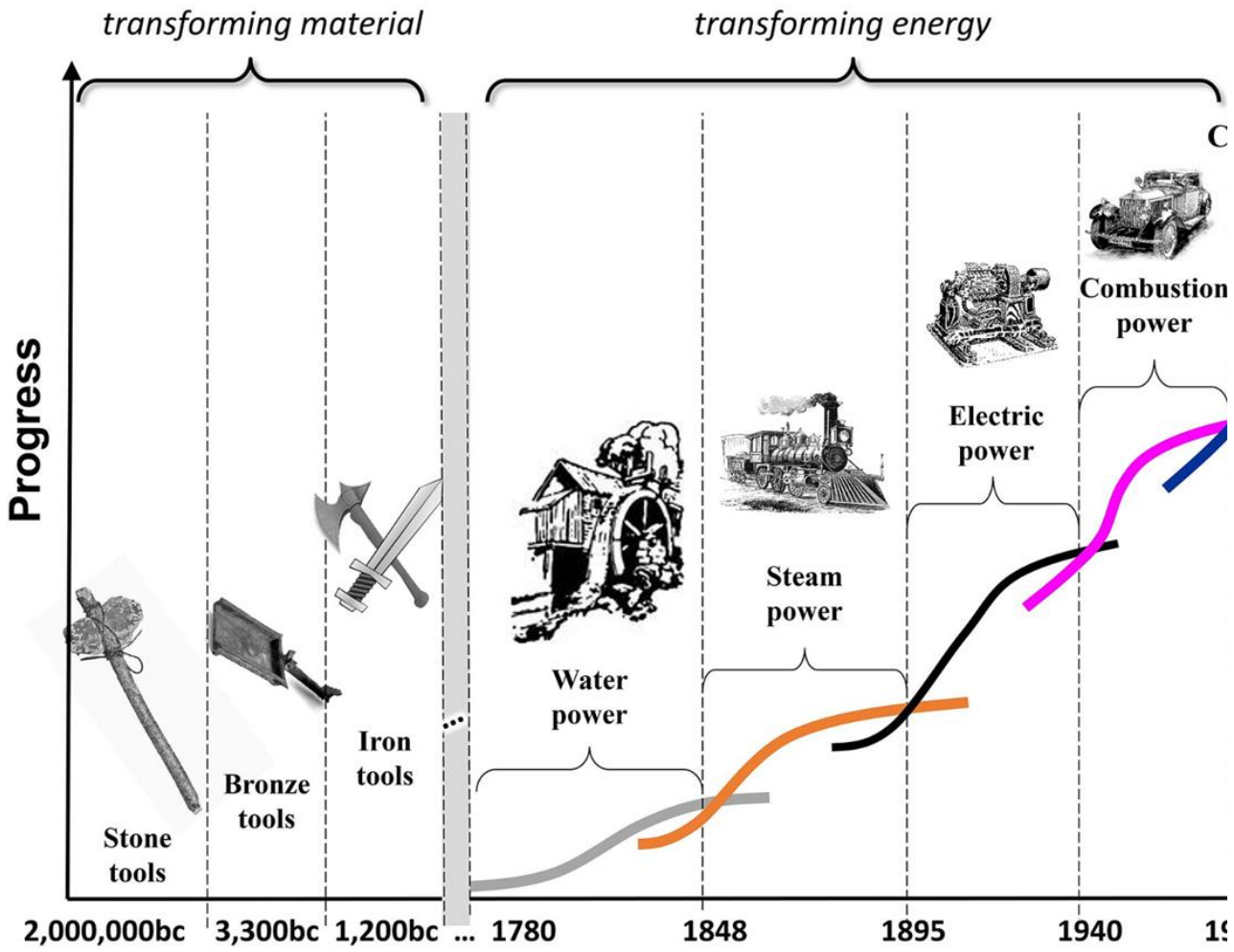

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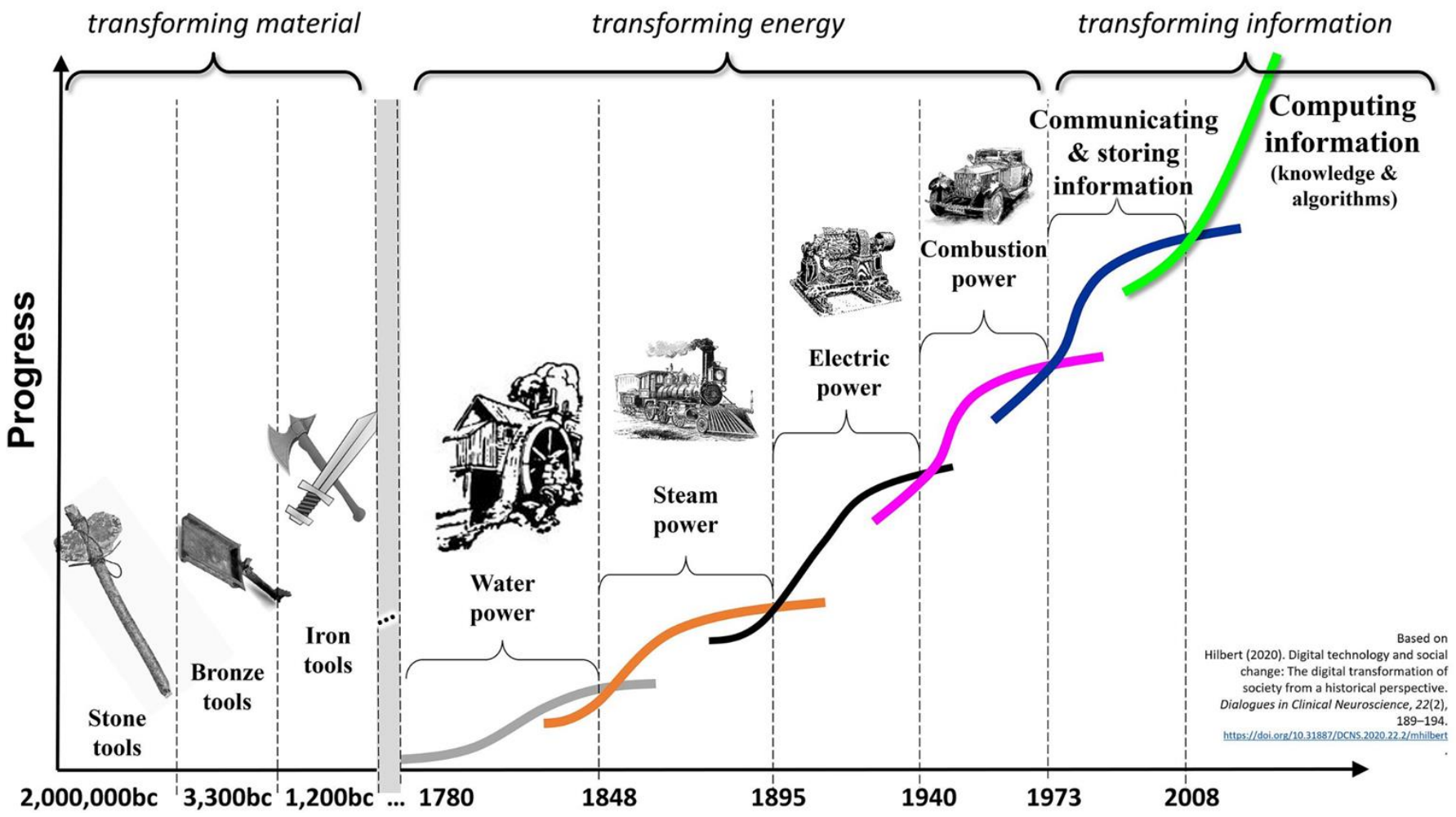

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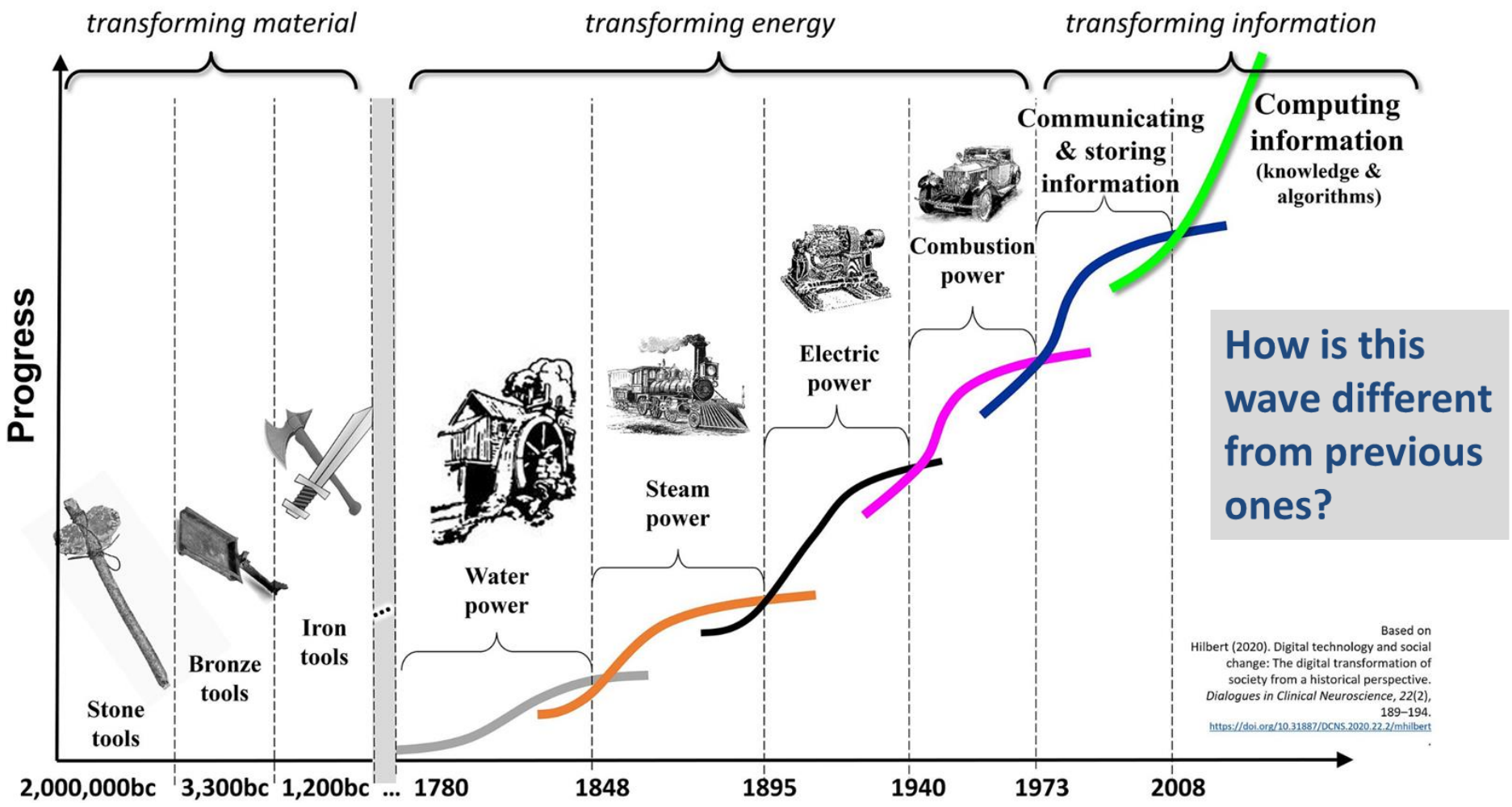

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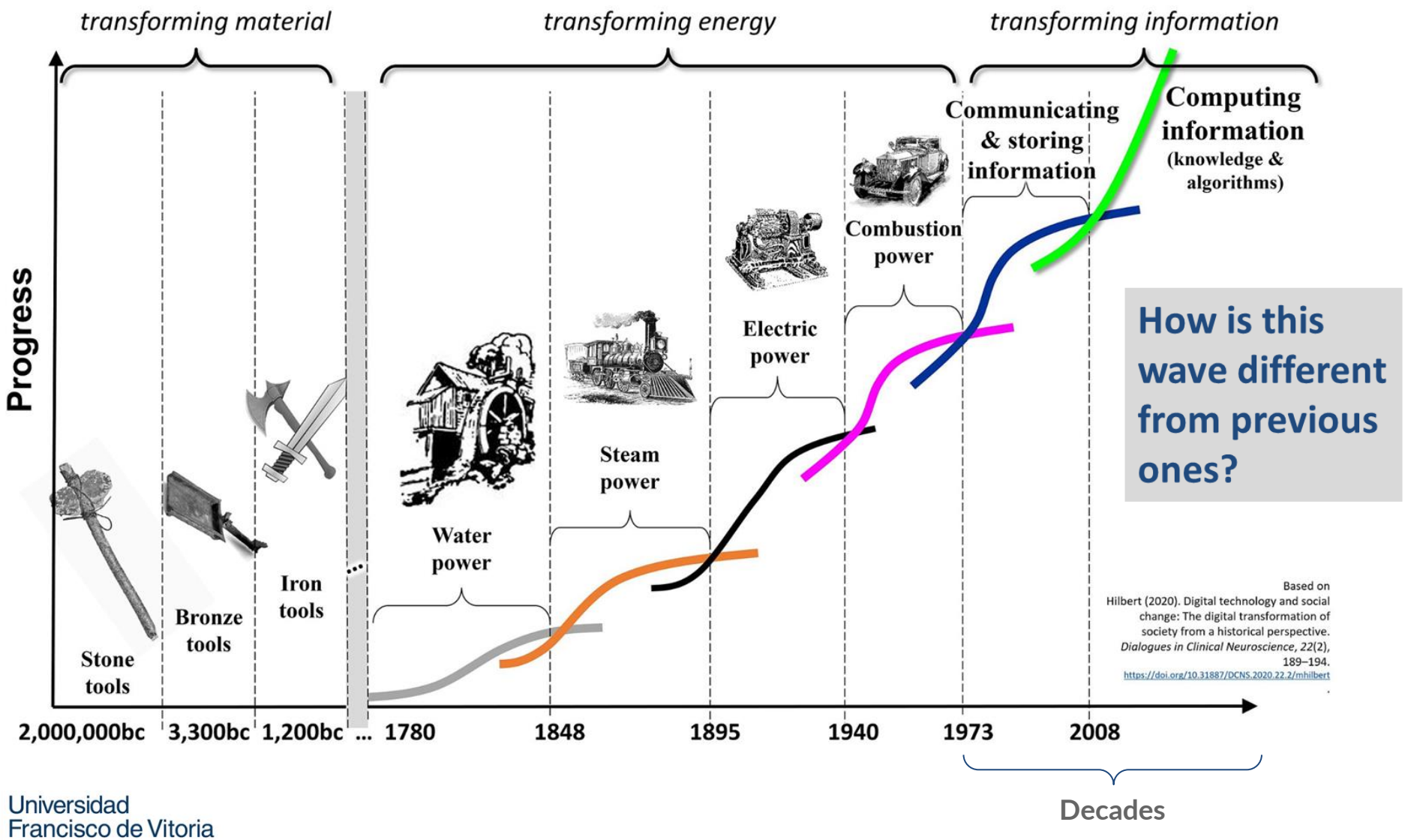

How is this wave different from previous ones?

Based on Hilbert (2020). Digital technology and social change: The digital transformation of society from a historical perspective. *Dialogues in Clinical Neuroscience*, *22*(2), 189–194. https://doi.org/10.31887/DCNS.2020.22.2/mhilbert

https://www.youtube.com/watch?v=u06BXgWbGvA

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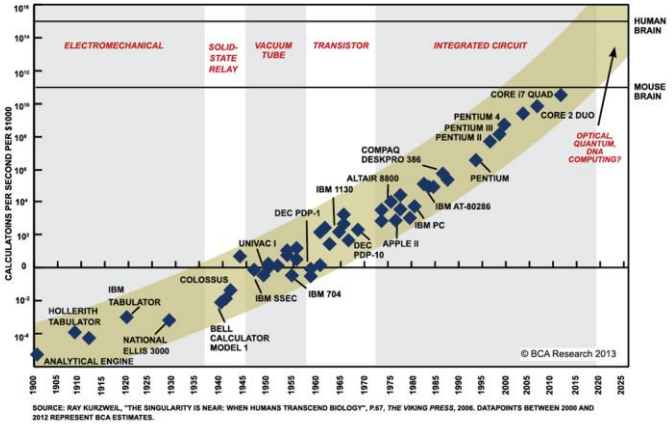
The technology wave

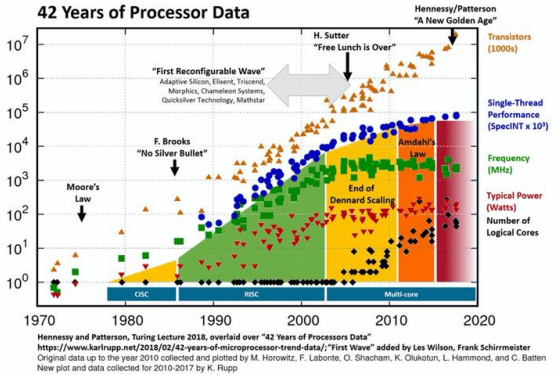
Moore's Law

In 1965, **Gordon Moore** posited that roughly every two years, the number of transistors on microchips will double. Commonly referred to as Moore's Law, this phenomenon suggests that computational progress will become significantly faster, smaller, and more efficient over time.



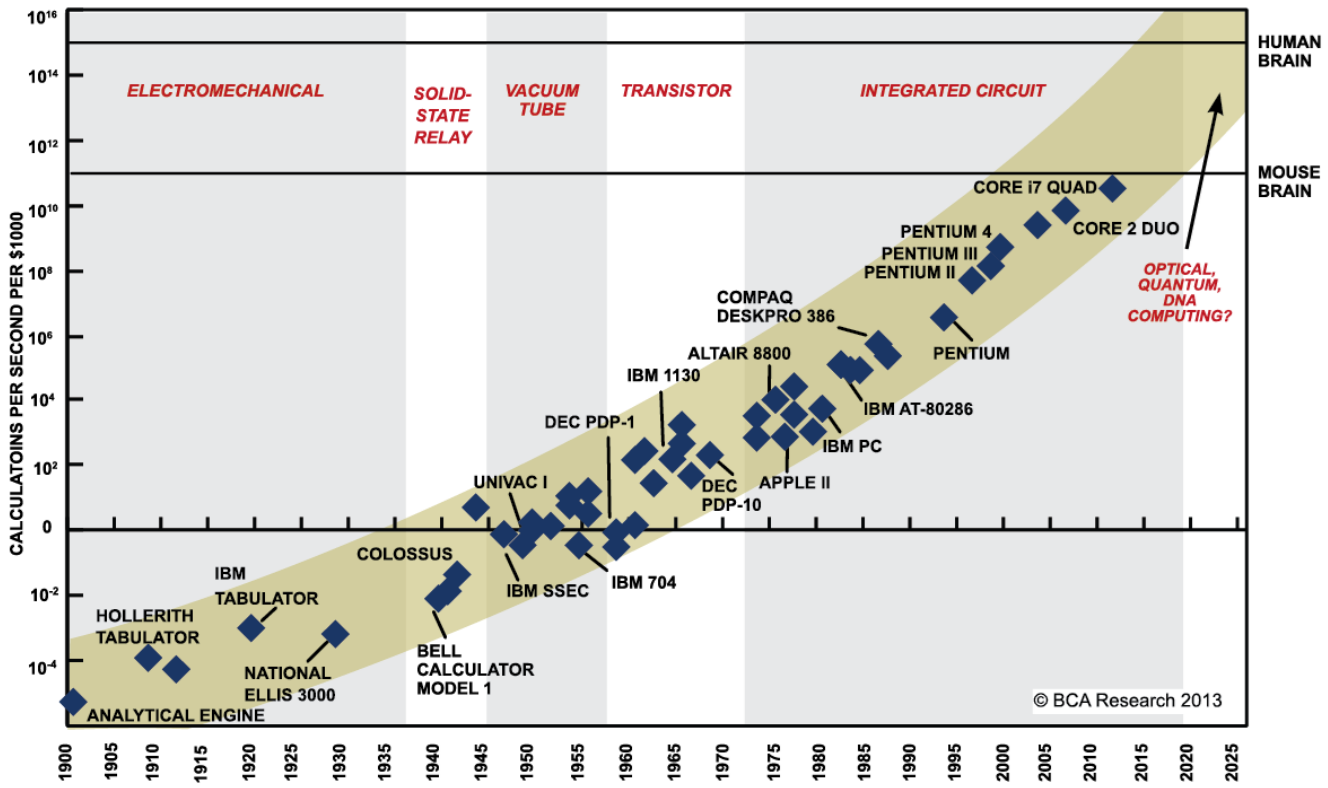
Moore's Law is estimated to end sometime in the 2020s.

Transistors will be unable to operate within smaller circuits at increasingly higher temperatures. This is due to the fact that cooling the transistors will require more energy than the energy that passes through the transistor itself.



The technology wave

Moore's Law



SOURCE: RAY KURZWEIL, "THE SINGULARITY IS NEAR: WHEN HUMANS TRANSCEND BIOLOGY", P.67, *THE VIKING PRESS*, 2006. DATAPOINTS BETWEEN 2000 AND 2012 REPRESENT BCA ESTIMATES.

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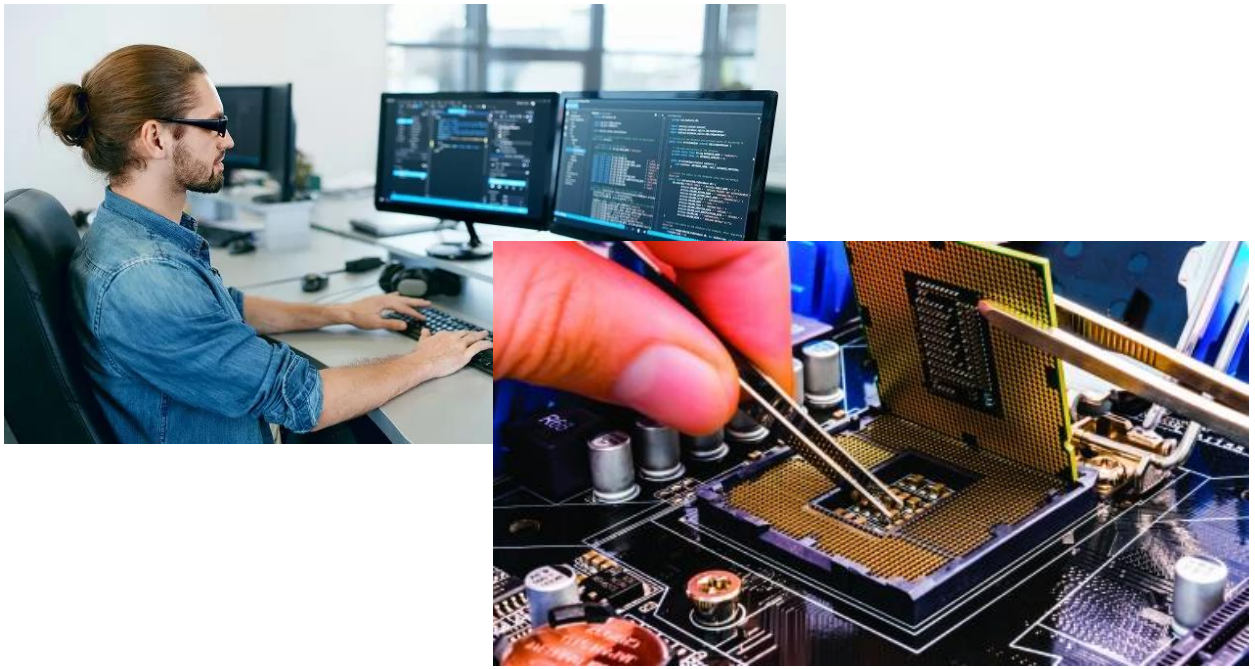
What is a Computer Engineer?

Computer Engineer

What is Computer Engineer?

Computer engineers provide IT solutions (involving digital information) to meet the needs of individuals and organisations based on:

- Hardware
- Software



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Which are the benefits that ICT provides to people?

Computer Engineer - Benefits

Which are the benefits?

Access to information

New ways to understand the world

Security

New technologies to control people

New ways to entertainments

New technologies to help people

New ways of learning

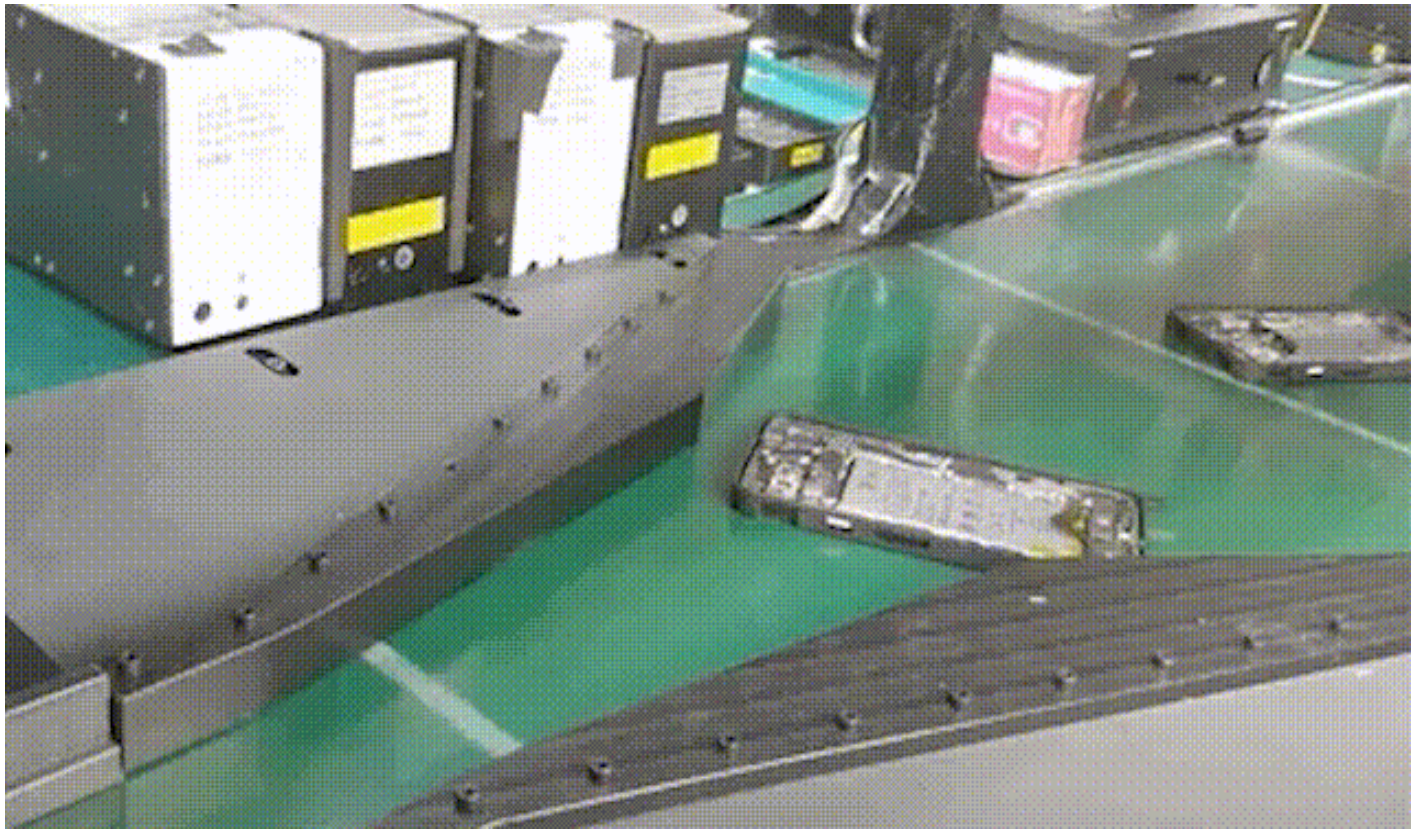
Save time

Computer Engineer - Benefits

Which are the benefits?

Computer Engineer - Benefits

Which are the benefits?



Computer Engineer - Benefits

Which are the benefits?

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Computer Engineer - Benefits

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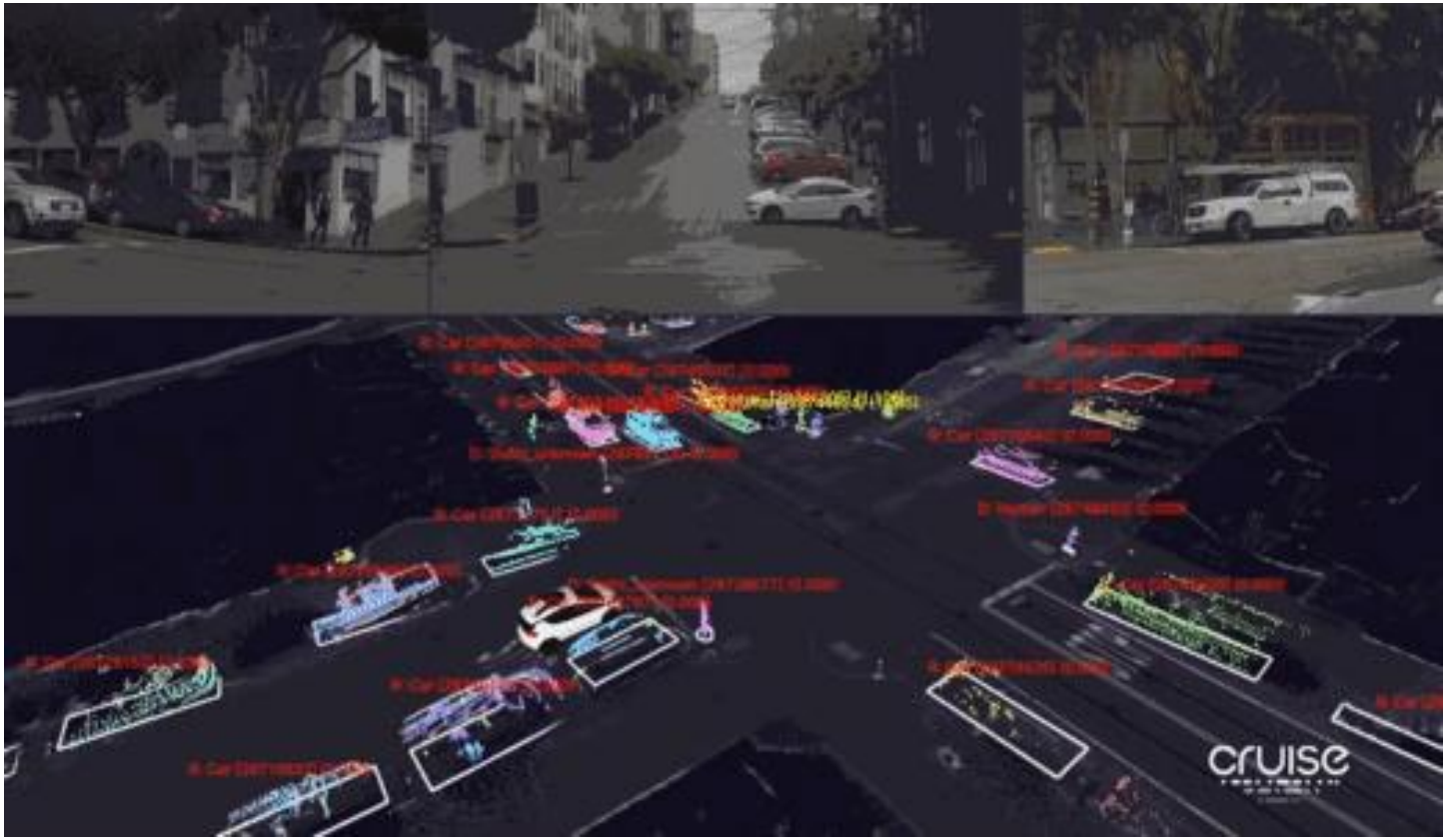

Computer Engineer - Benefits

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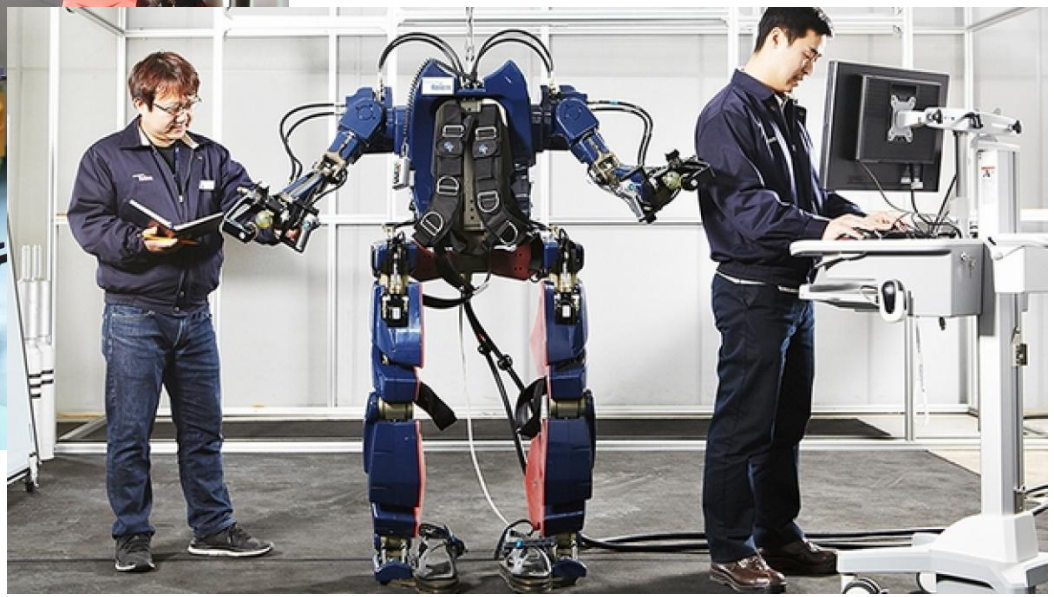

Computer Engineer - Benefits

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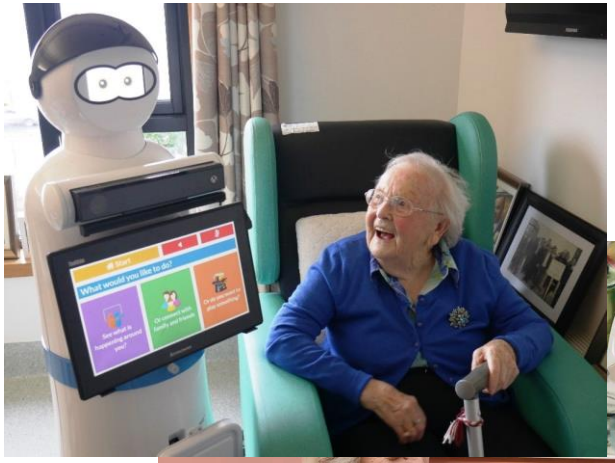

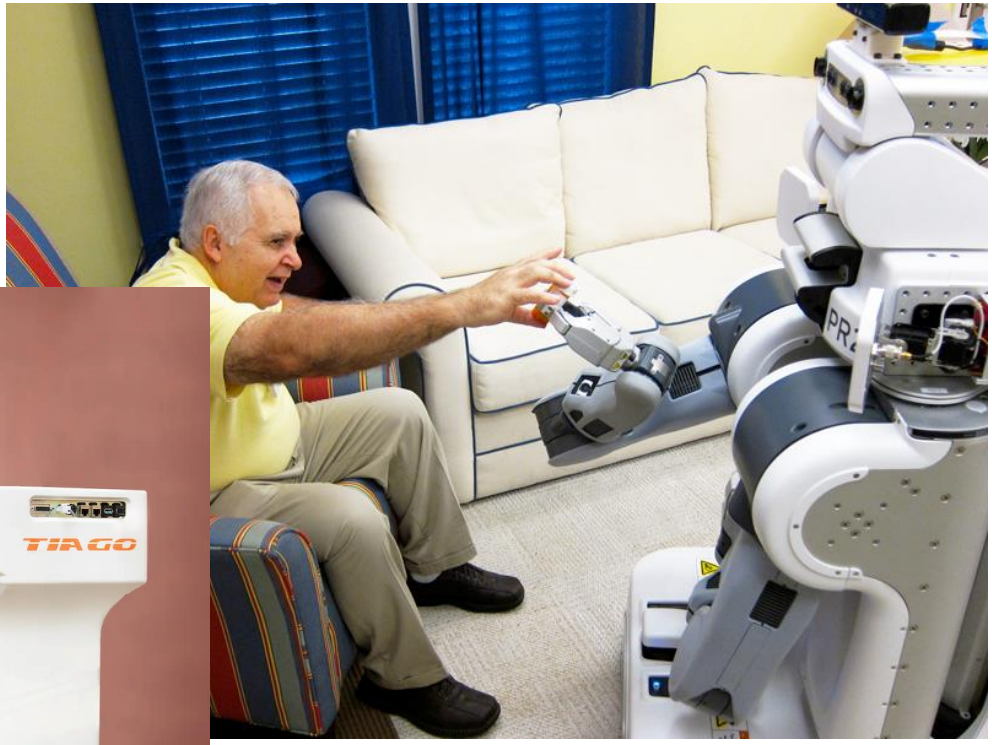

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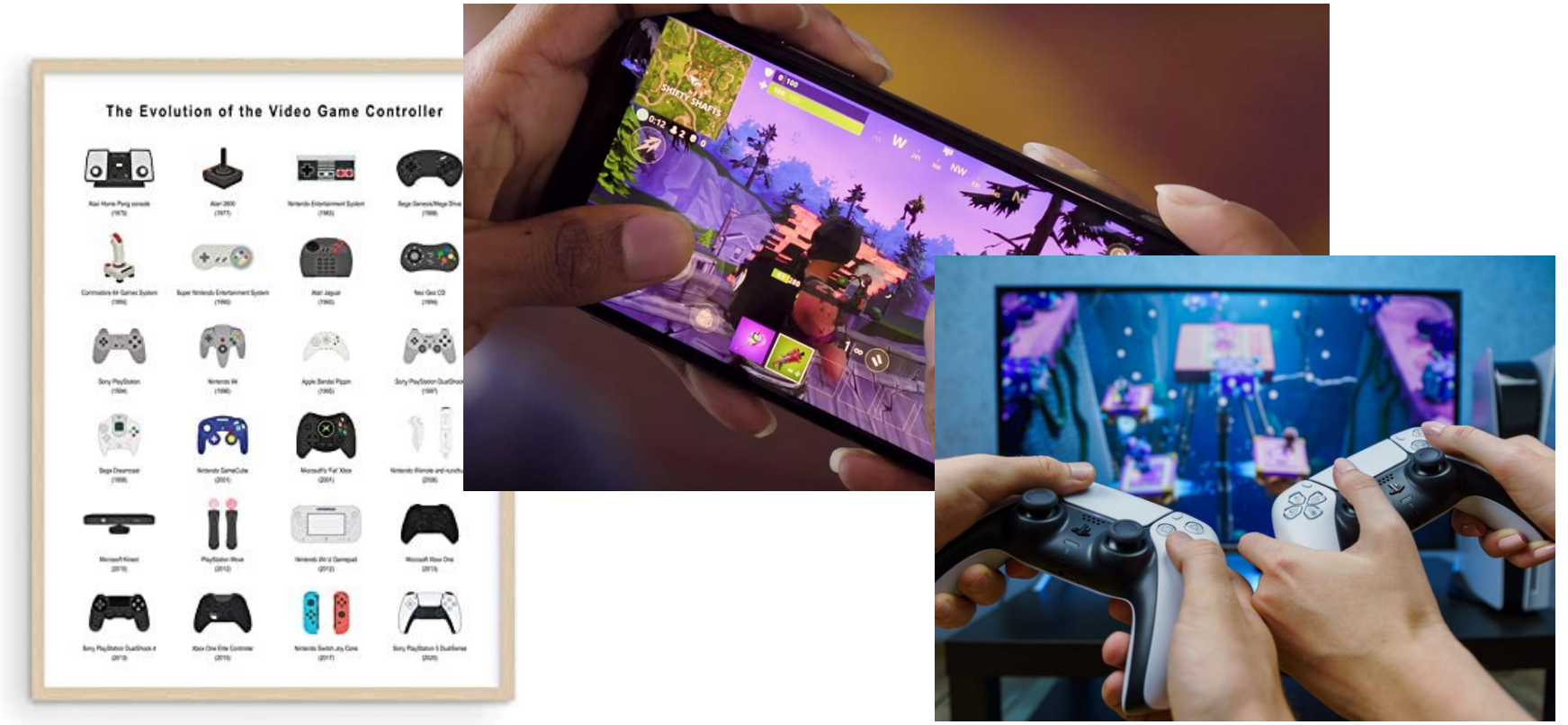

Computer Engineer - Benefits

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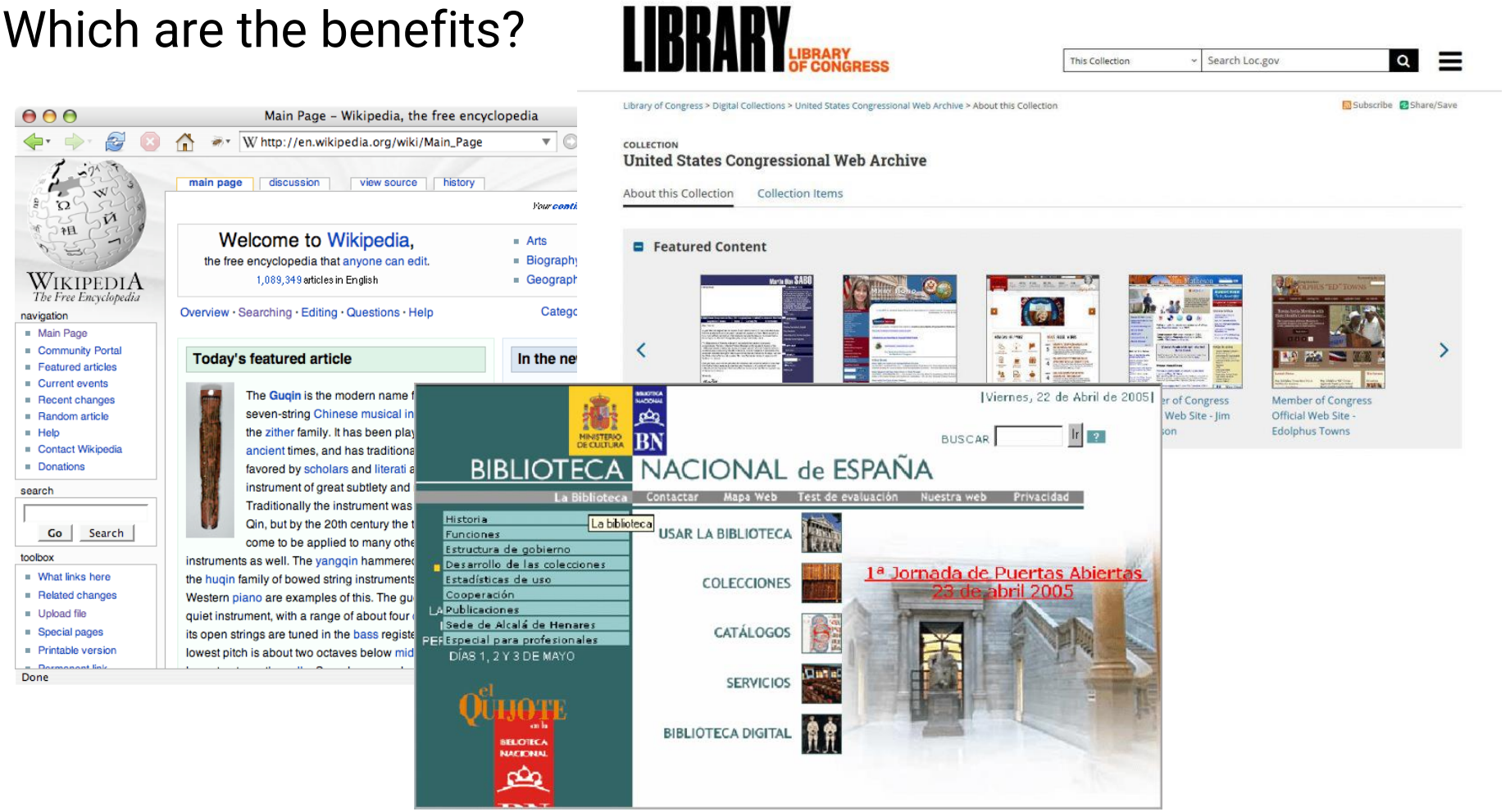

Which are the benefits?

Broaden and Improve our opportunities for a successful life

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Computer Engineering in today's society: Threats

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Thinking about

What kind of information is on Social Media?

Are you aware of the information we post?

What about the the contract to use some apps?

Is there any law which protect us?

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The integral training of the Computer Engineer

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Thinking about

What must a computer engineer who fulfils his mission

in such a world be like?

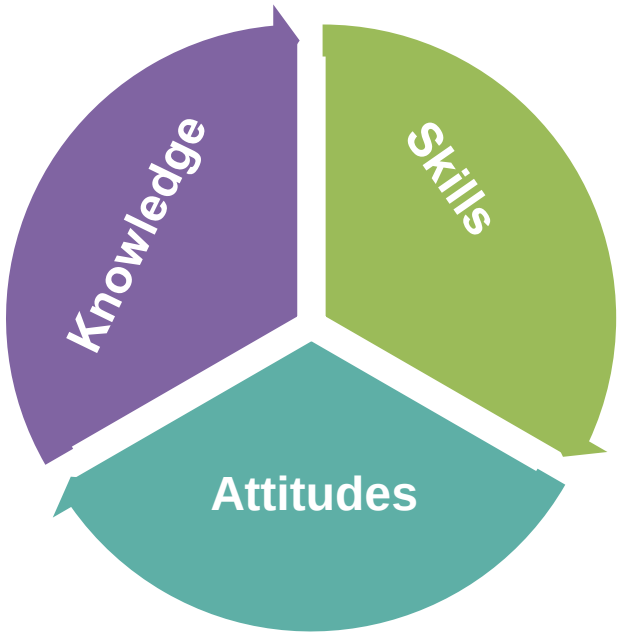
What kind of skills he must have?

What kind of experiences are good?

Soft skills what is this?

Thinking about

- He aims to provide engineers with a broader education that allows them not only to **devise technical solutions to a problem**, but also to read people's lives, to read society in order to **identify the challenges and needs** to which they can respond with their profession.
- He seeks to broaden the view of the world and the role of computer engineering and **technology in society**: not **everything is reduced to technology** and our field of knowledge.
- Her aim is to help future engineers to develop a professional career that is in line with their **life project** and that allows them to **develop as a person** and a professional.

Thinking about

- To develop the future engineer as a whole, knowing that personal and professional competences involve much more than just knowledge.