UNIVERSITY OF WATERLOO

Promises and pitfalls of technological revolutions

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Forty-five years ago

Four technological revolutions in forty-five years

Computers and software

The Internet

Mobile phones

Artificial Intelligence

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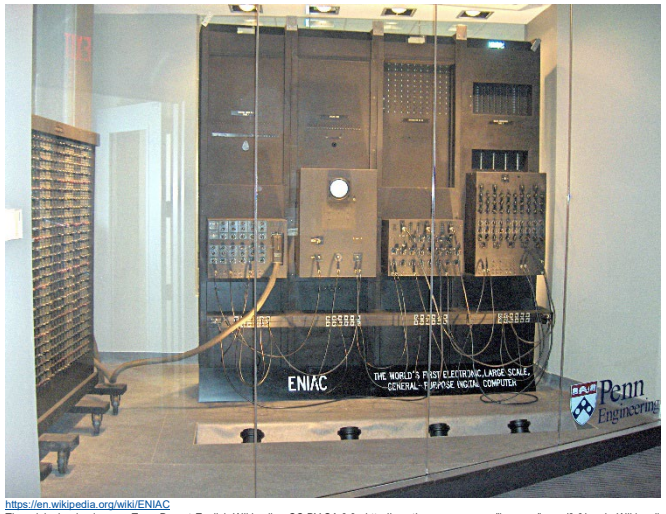
1. Computers and software

1950



https://en.wikipedia.org/wiki/ENIAC
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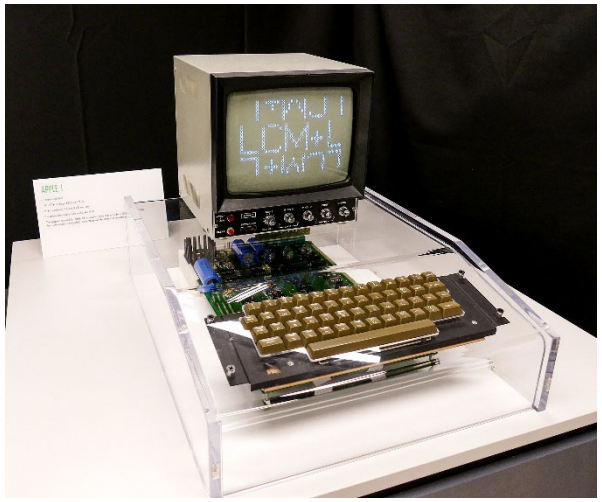
1976



By Cynde Moya - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=58165847

1981

https://en.wikipedia.org/wiki/IBM_Personal_Computer
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1981

https://en.wikipedia.org/wiki/Microsoft
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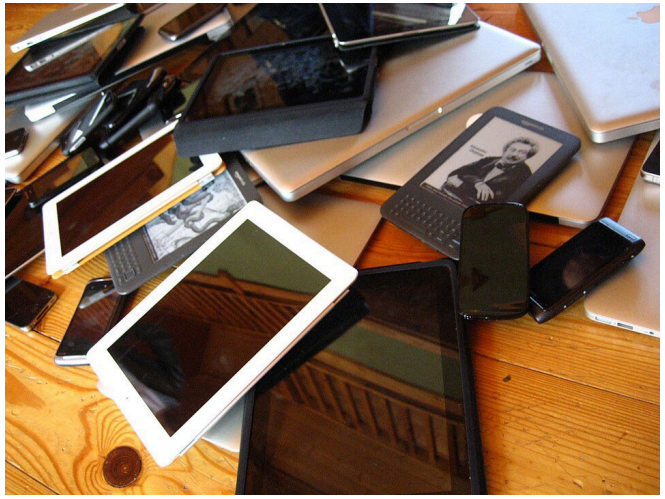
Computers run all aspects of our lives today

https://www.forbesindia.com/article/isbinsight/need-for-national-digital-readiness-within-the-indian-healthcare-system/72165/1 Image: Shutterstock

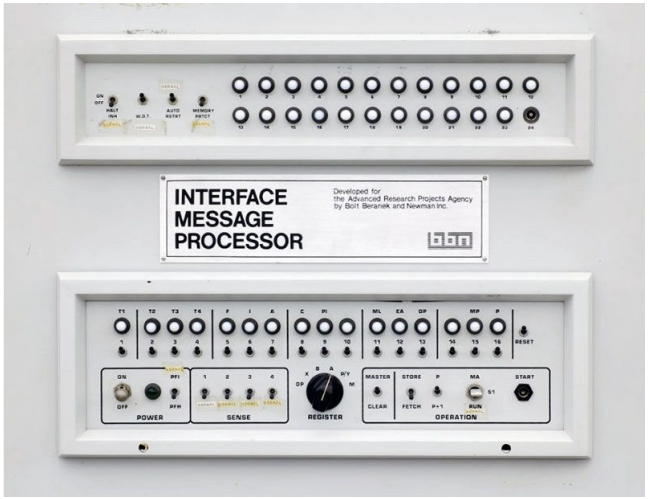


https://upload.wikimedia.org/wikipedia/commons/4/45/Device_pile.jpg
Jeremy Keith, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons

https://www.walmart.com/ip/Display-Onboard-Computer-Kt-Led900-Speedometer-24-36-48V-Pedelec-For-E-Bike-Kt/11120772024 Mingyiq Inc

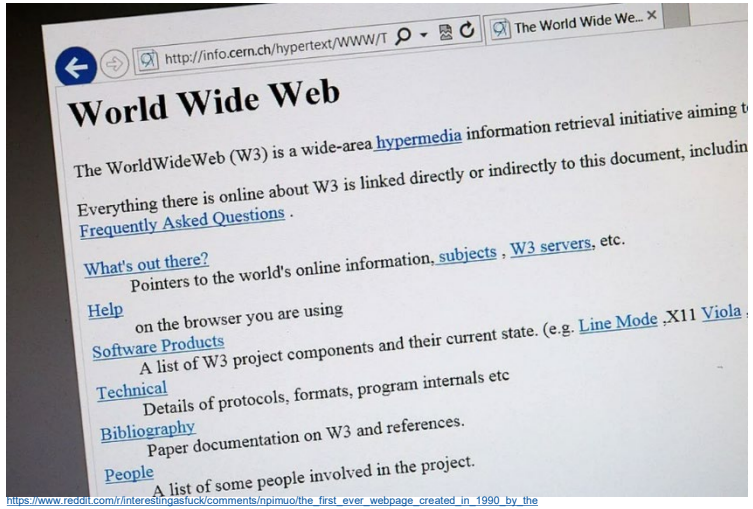
2. The Internet

1969



https://en.wikipedia.org/wiki/Interface_Message_Processor

1990

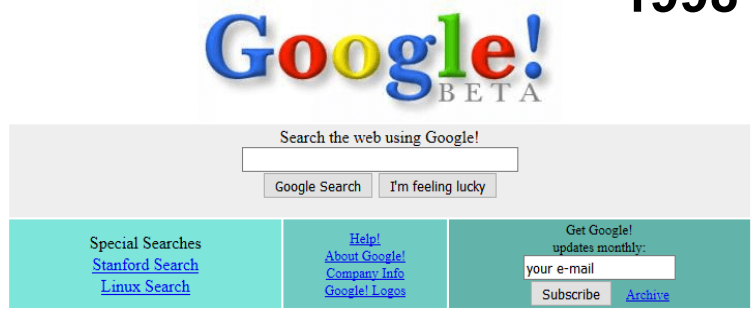


https://www.reddit.com/r/interestingasfuck/comments/npimuo/the_first_ever_webpage_created_in_1990_by_the

2000

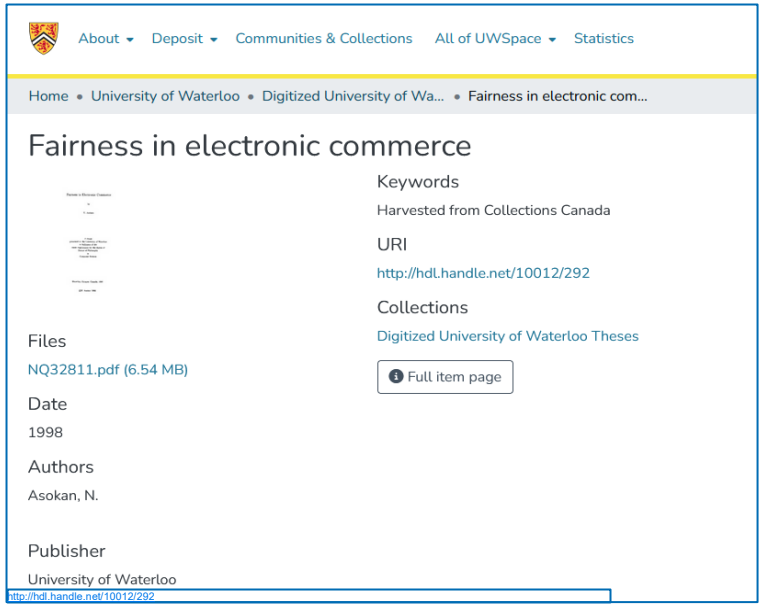
https://money.cnn.com/gallery/technology/2015/05/08/old-websites/5.html

1998

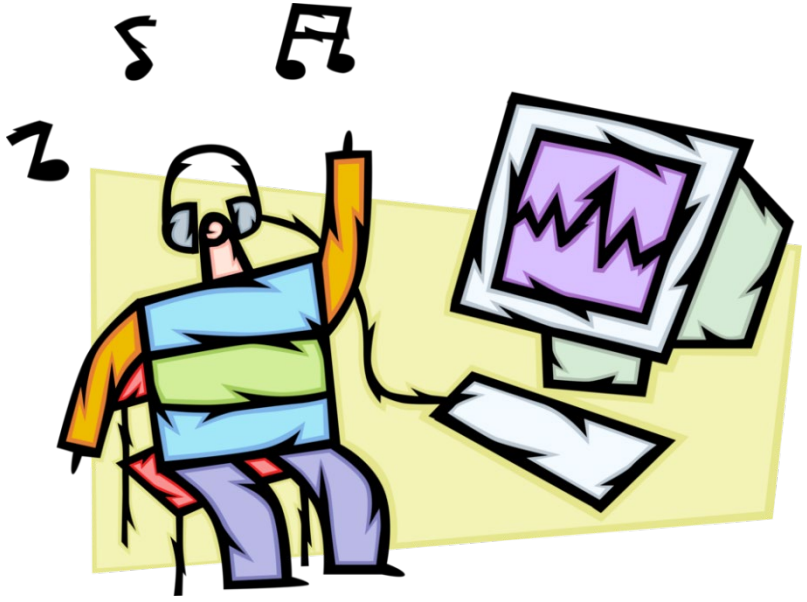


https://www.webdesignmuseum.org/gallery/google-1998 Copyright ©1998 Google Inc.

My journey: PhD research in electronic commerce



Now, it is hard to imagine life without Internet access



3. Mobile phones

1973

https://en.wikipedia.org/wiki/Motorola_DynaTAC By Redrum0486 - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=6421950

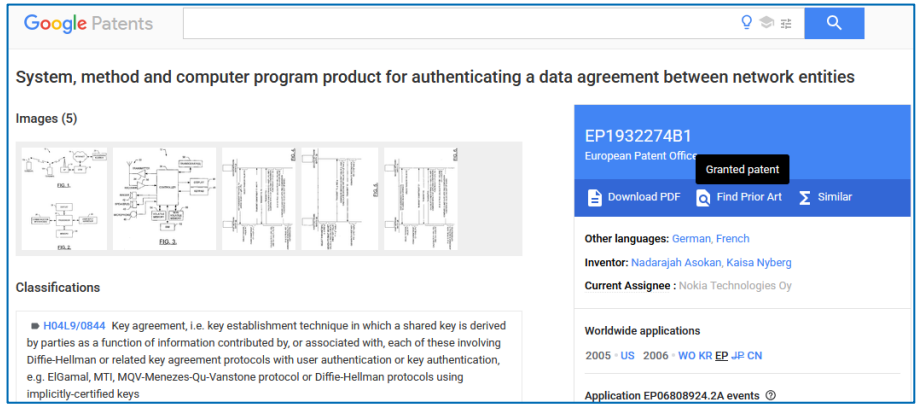
1996

https://en.wikipedia.org/wiki/Nokia_9000_Communicator By Oldmobil - Self-photographed, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=7861738

NOKIA
Connecting People

https://www.freepnglogos.com/images/nokia-logo-png-1490.html

My journey: witness to widely deployed technologies



https://patents.google.com/patent/EP1932274B1/en

https://web.archive.org/web/20061018032605/http://www.bluetooth.com/NR/rdonlyres/0A0B3F36-D15F-4470-85A6-F2CCFA26F70F/0/SimplePairing_WP_V10r00.pdf

Today, mobile phones are universal

Leaders | Smartphones

Planet of the phones

The smartphone is ubiquitous, addictive and transformative

Feb 26th 2015

The Economist https://www.economist.com/leaders/2015/02/26/planet-of-the-phones

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https://www.snl24.com/dailysun/techitout/cool-things-your-smartphone-can-do-20221206

https://womenlovetech.com/bridging-the-gap-smartphones-in-third-world-countries/

https://antiguadailyphoto.com/2015/01/12/the-maya-and-smartphones/

4. Artificial intelligence

1973

A PROPOSAL FOR THE
DARTMOUTH SUMMER RESEARCH PROJECT
ON ARTIFICIAL INTELLIGENCE

J. McCarthy, Dartmouth College
M. L. Minsky, Harvard University
N. Rochester, I.B.M. Corporation
C.E. Shannon, Bell Telephone Laboratories

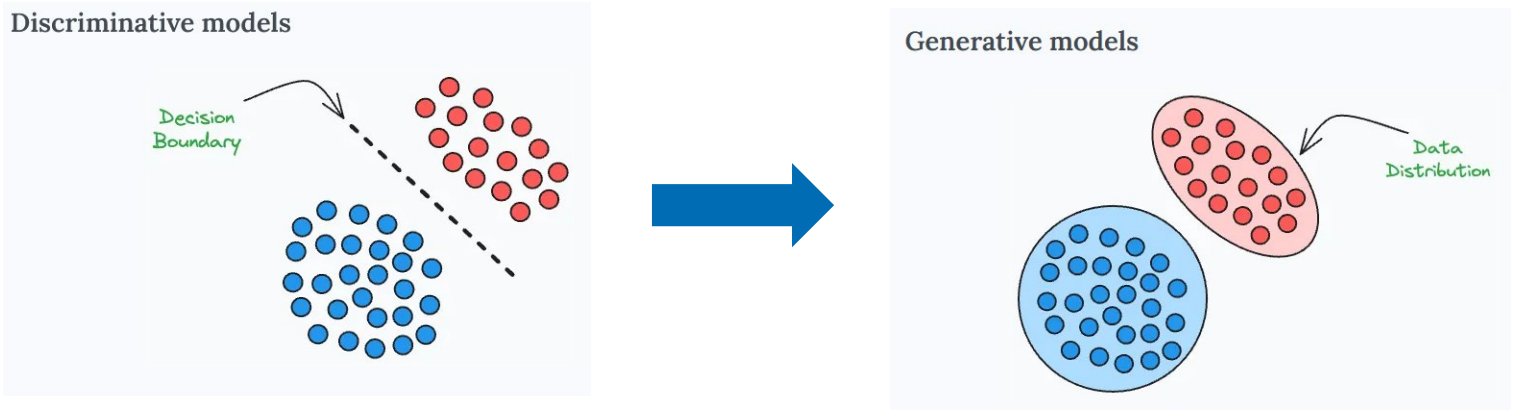
August 31, 1955

https://jmc.stanford.edu/articles/dartmouth/dartmouth.pdf

AlexNet **2011**

Developer(s)	Alex Krizhevsky, Ilya Sutskever, and Geoffrey Hinton
Initial release	Jun 28, 2011
Repository	code.google.com/archive/p/cuda-convnet/
Written in	CUDA, C++
Type	Convolutional neural network
License	New BSD License

https://en.wikipedia.org/wiki/AlexNet



https://blog.dailydoseofds.com/p/an-intuitive-guide-to-generative

deepseek

Gemini

AI will transform how we live, work, and play

EDITORS' PICK | LEADERSHIP > CAREERS

Why We're Entering The Era Of The Solopreneur

By Caroline Castrillon, Senior Contributor. Caroline Castrillon covers care... Follow Author

Jul 21, 2024, 04:30pm EDT

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https://www.forbes.com/sites/carolinecastrillon/2024/07/21/entering-the-era-of-the-solopreneur/

Technological revolutions bring new concerns

Bad actors subvert or circumvent a technology towards their own ends

→ Cybersecurity

A technology can leak people's private information

→ Privacy technologies, law, public policy, …

Someone can intentionally or unintentionally use a technology to cause harm

→ Ethics, philosophy, …

Ethical concerns with AI

Unaligned AI

AI alignment

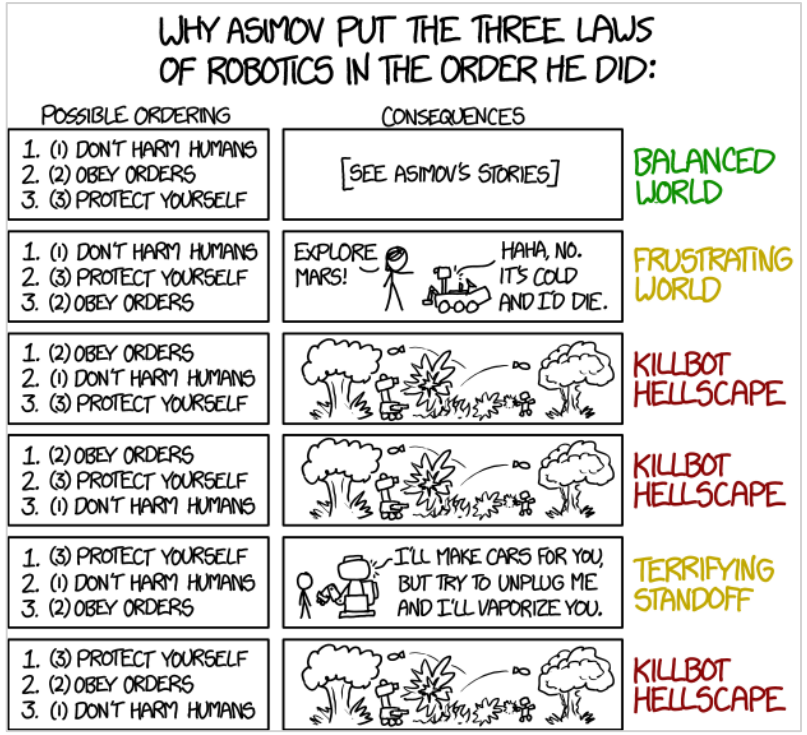
Article Talk

From Wikipedia, the free encyclopedia

In the field of artificial intelligence (AI), **AI alignment** research aims to steer AI systems toward a person's or group's intended goals, preferences, and ethical principles. An AI system is considered *aligned* if it advances its intended objectives. A *misaligned* AI system may pursue some objectives, but not the intended ones.[1]

It is often challenging for AI designers to align an AI system due to the difficulty of specifying the full range of desired and undesired behaviors. To aid them, they often use simpler *proxy goals*, such as gaining human approval. But that approach can create loopholes, overlook necessary constraints, or reward the AI system for merely *appearing* aligned.[1][2]

https://en.wikipedia.org/wiki/AI_alignment



https://xkcd.com/1613/

AI-enabled fraud

OCTOBER 30, 2023

Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence

BRIEFING ROOM › PRESIDENTIAL ACTIONS

https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/

Takeaways

You will live through (and shape!) more technological revolutions

They will have similar concerns: calls for a wide range of expertise

→ technologists, lawyers, teachers, journalists, policy makers, poets, …

Equip yourself with the right knowledge and skills: depth but also breadth

Trinity inculcates the importance of a rounded education: Build on it!

https://medium.com/@asokan.public/promises-and-pitfalls-of-technological-revolutions-2dce8761e523