Lisbon School of Economics & Management
Universidade de Lisboa

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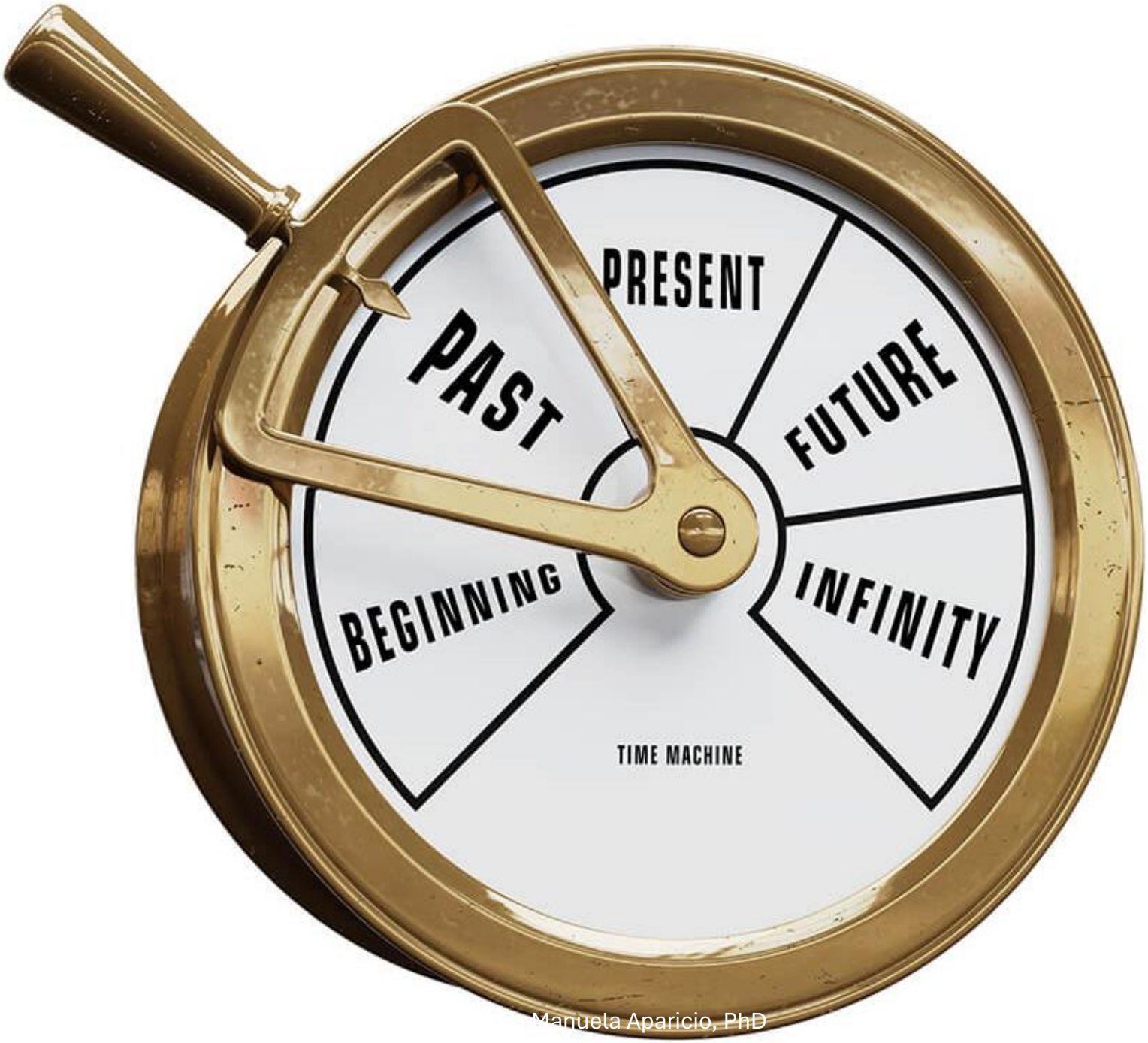
UNIVERSIDADE DE LISBOA

History of Computing and Computers

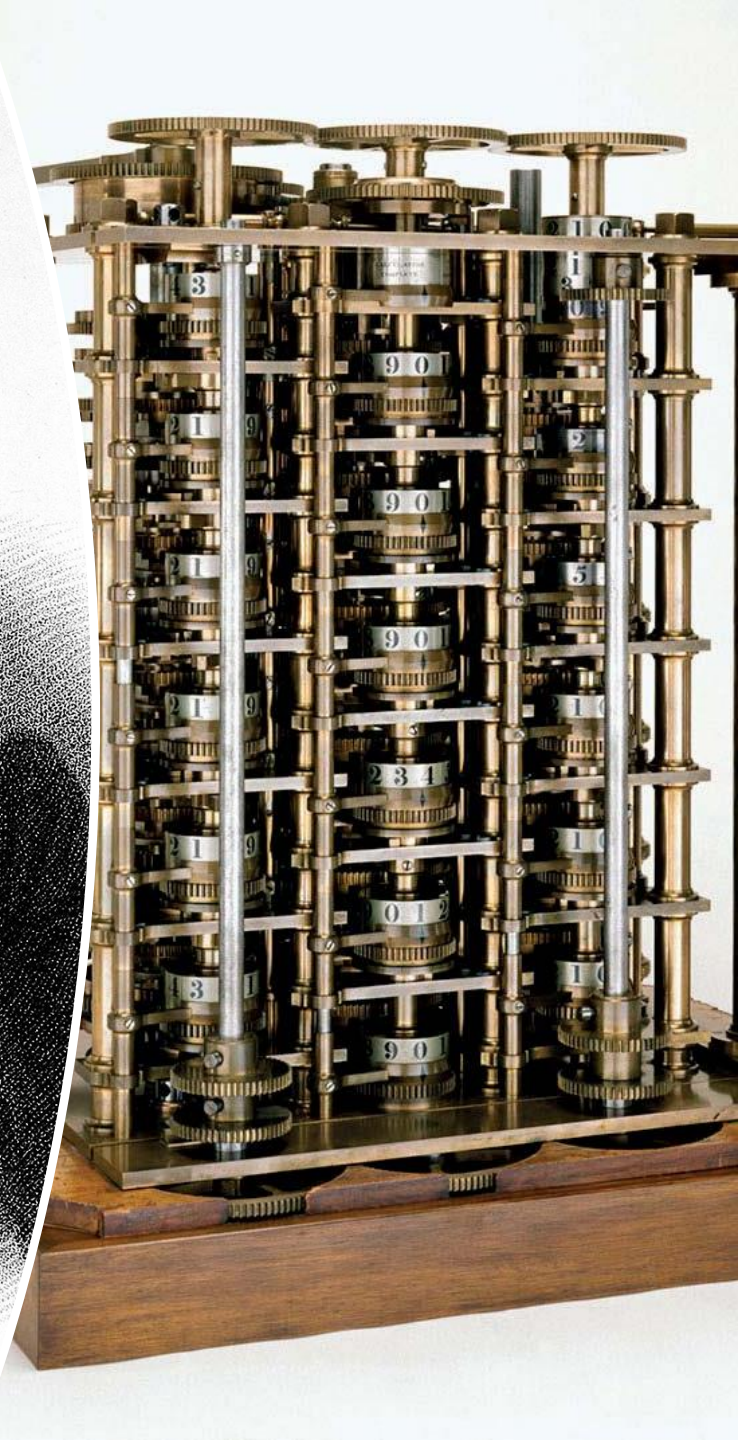
Carlos J. Costa



Manuela Aparicio, PhD

Charles Babbage's Difference Engine, 1832.

- Charles Babbage



Ada Lovelace: first computer programmer (1815-1853)

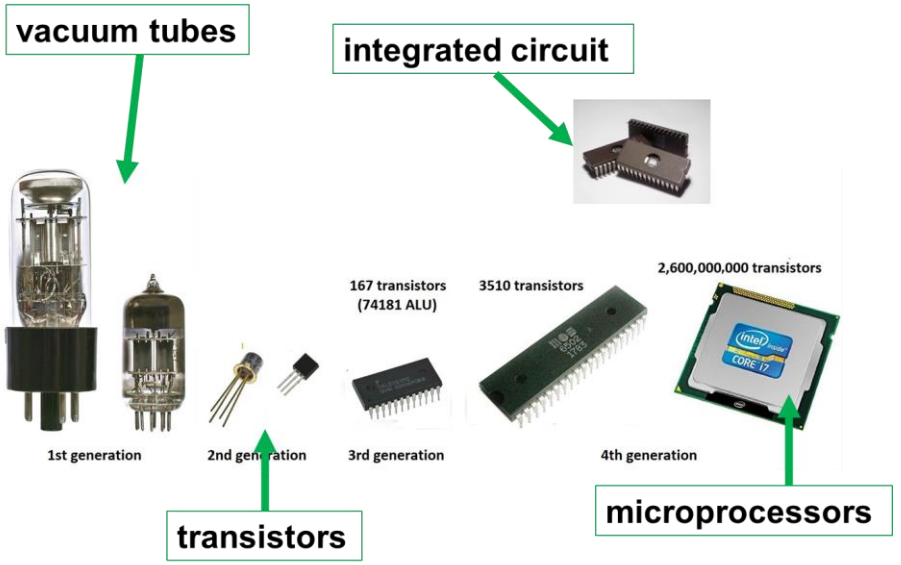
Alan Turing

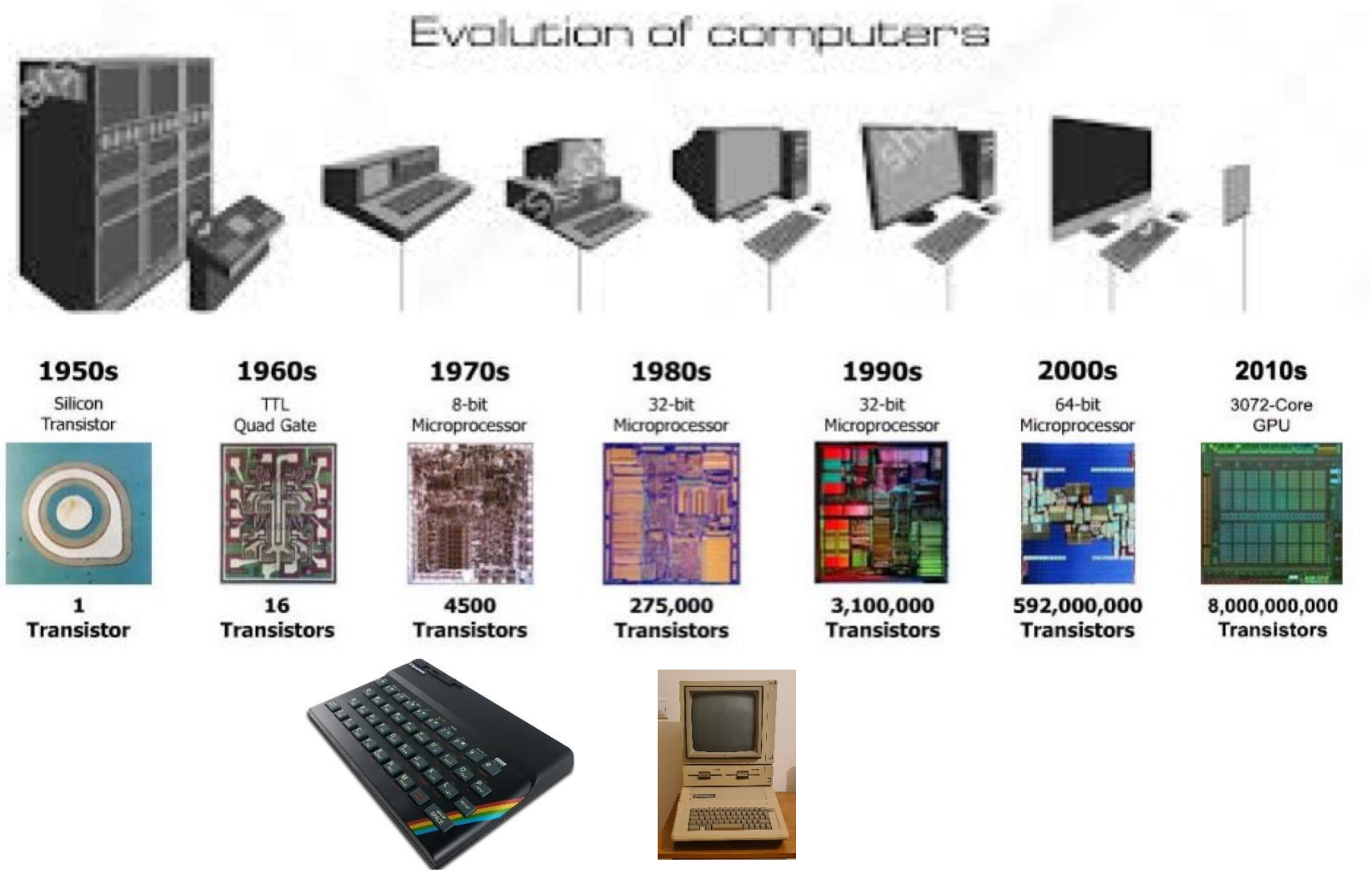
- **Alan Turing (**June 23, 1912 - June 7, 1954)
- Code-breaking war hero, now considered the father of computer science and artificial intelligence.”
- https://amturing.acm.org/
- https://amturing.acm.org/acm_tcc_webcasts.cfm
- Film “The imitation game”https://www.imdb.com/title/tt2084970/

Grace Hopper

- Grace Hopper (1906–1992) was a computer scientist and rear admiral in the United States Navy.
- Hopper translated mathematical notation into machine code.
- She wrote "first computer debugging" program.

Electronics Components

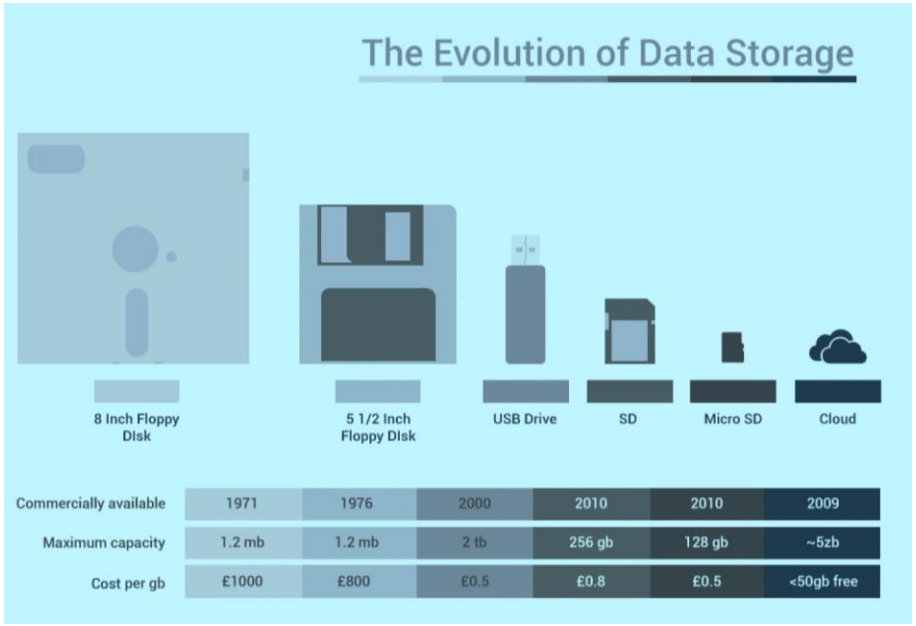



Evolution of computers
1950s
Silicon Transistor
1 Transistor
1960s
TTL Quad Gate
16 Transistors
1970s
8-bit Microprocessor
4500 Transistors
1980s
32-bit Microprocessor
275,000 Transistors
1990s
32-bit Microprocessor
3,100,000 Transistors
2000s
64-bit Microprocessor
592,000,000 Transistors
2010s
3072-Core GPU
8,000,000,000 Transistors

Hardware

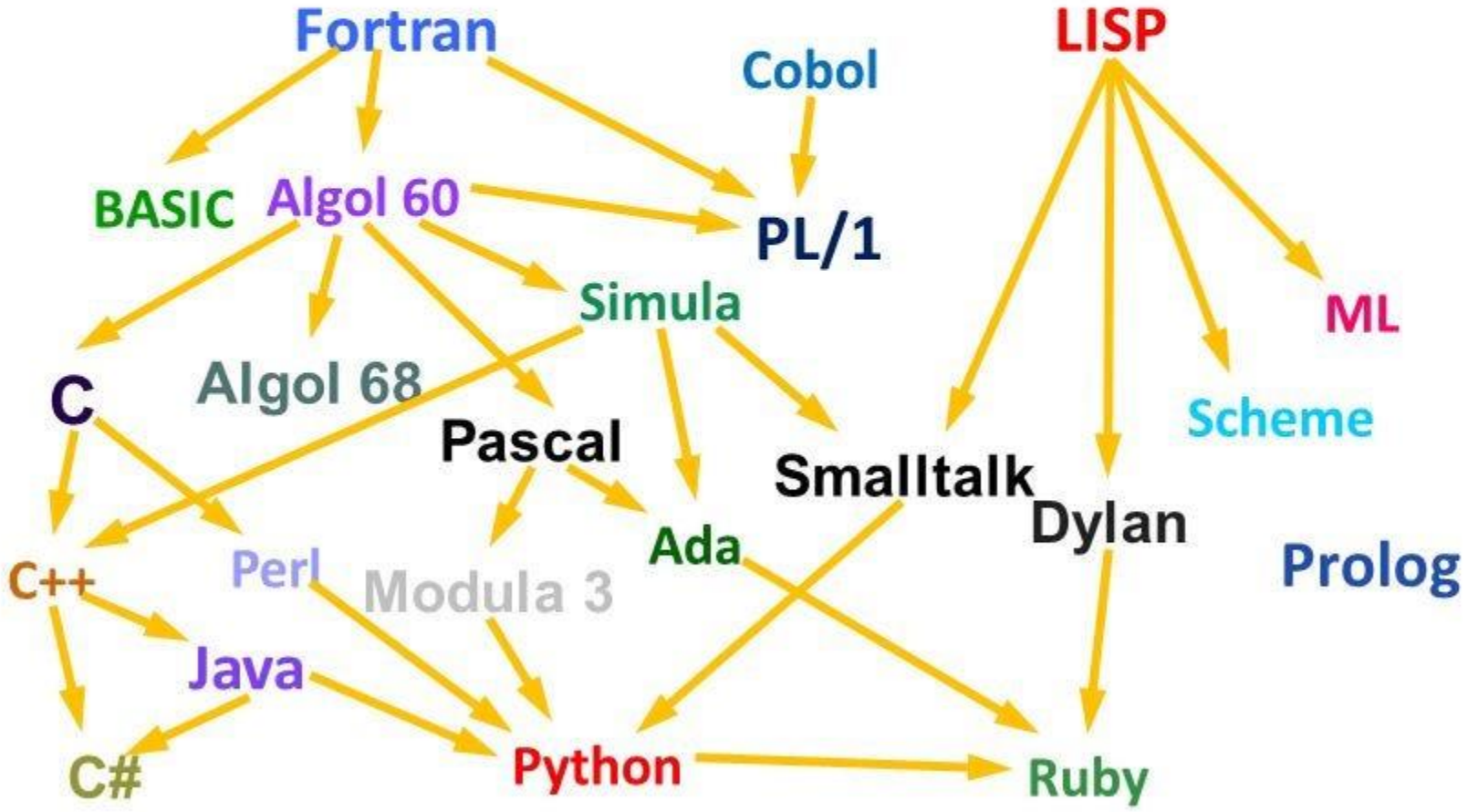
Data Storage Timeline

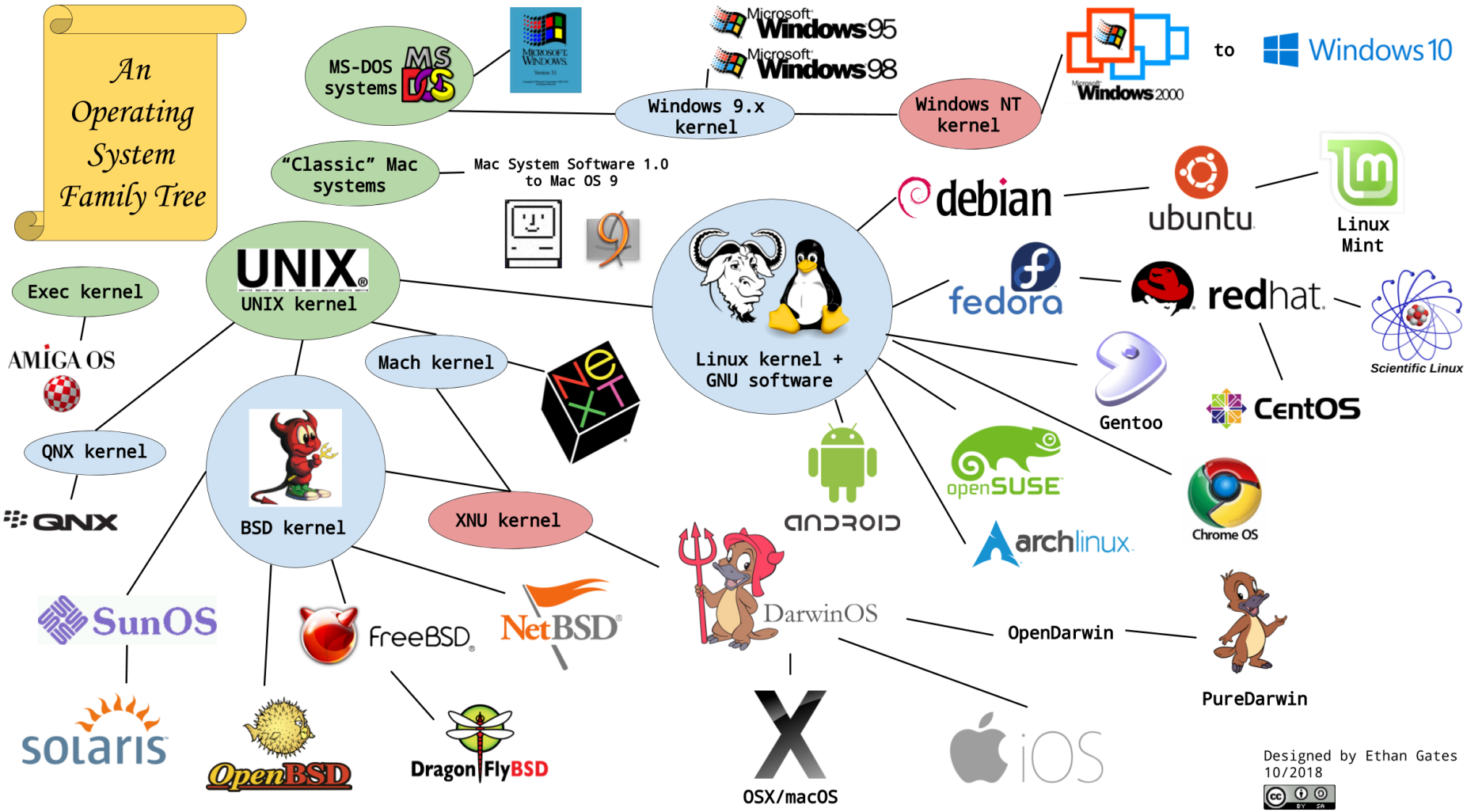
- 8-inch floppy disk
- 5 ½ inch Floppy Disk
- USB Drive
- SD
- Micro SD
- Cloud



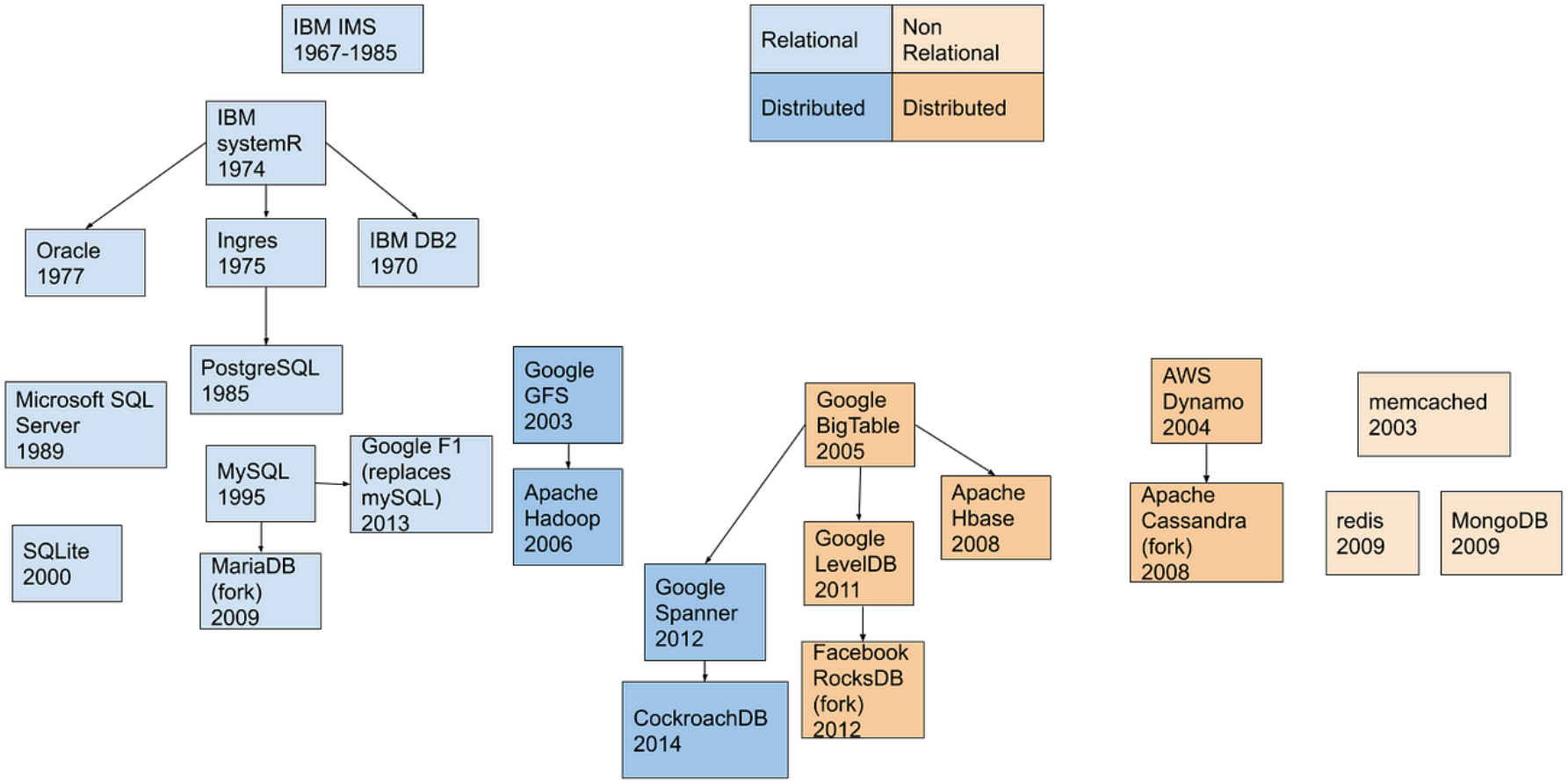
A family tree of languages

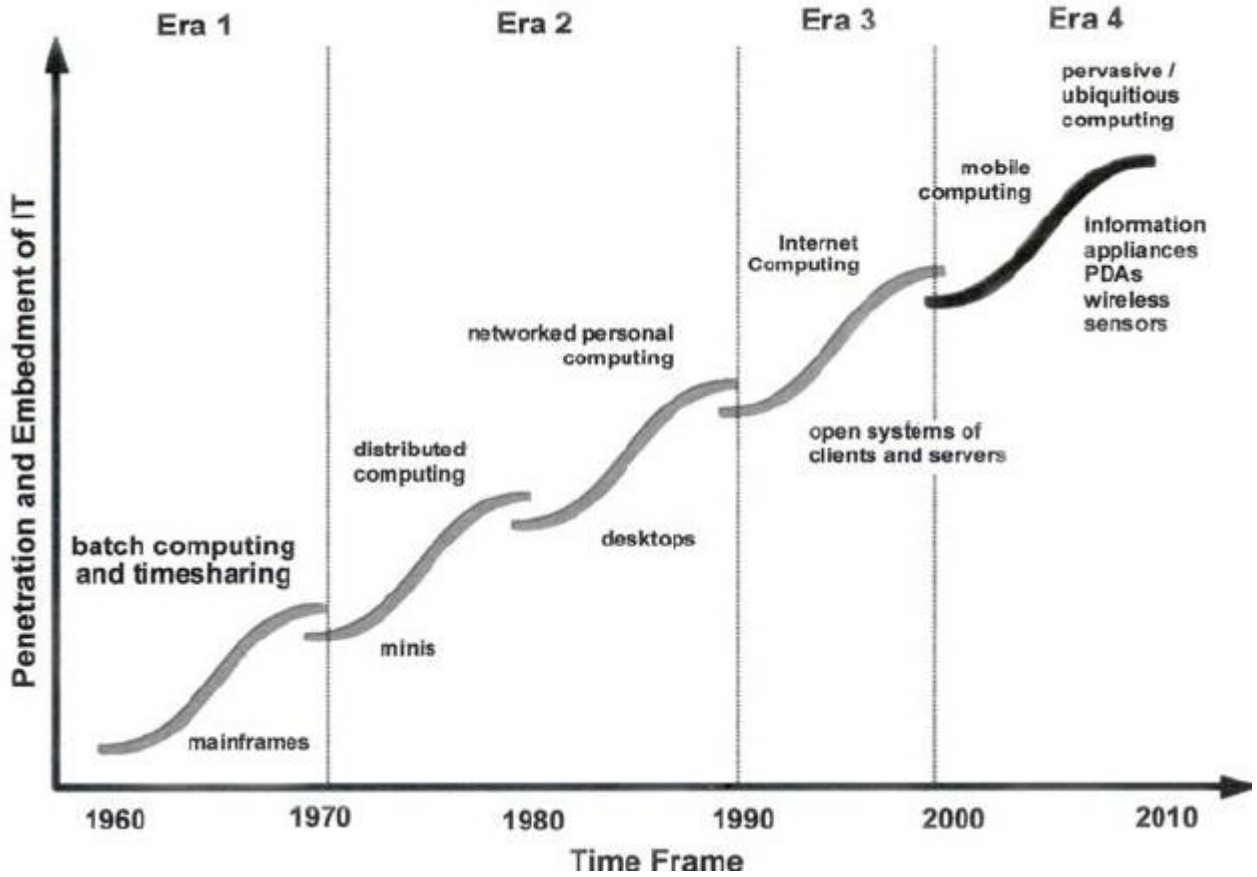
Some of the 2400 + programming languages




An Operating System Family Tree
MS-DOS systems
Windows 9.x kernel
Windows NT kernel
to
Windows 10
"Classic" Mac systems
Mac System Software 1.0 to Mac OS 9
UNIX
UNIX kernel
Exec kernel
AMIGA OS
QNX kernel
QNX
Mach kernel
BSD kernel
XNU kernel
Linux kernel + GNU software
debian
ubuntu
Linux Mint
fedora
redhat
Scientific Linux
Gentoo
CentOS
openSUSE
archlinux
Chrome OS
ANDROID
SunOS
FreeBSD
NetBSD
DarwinOS
OpenDarwin
PureDarwin
solaris
OpenBSD
DragonFlyBSD
OSX/macOS
iOS
Designed by Ethan Gates
10/2018

DBMS – Data Base Management Systems



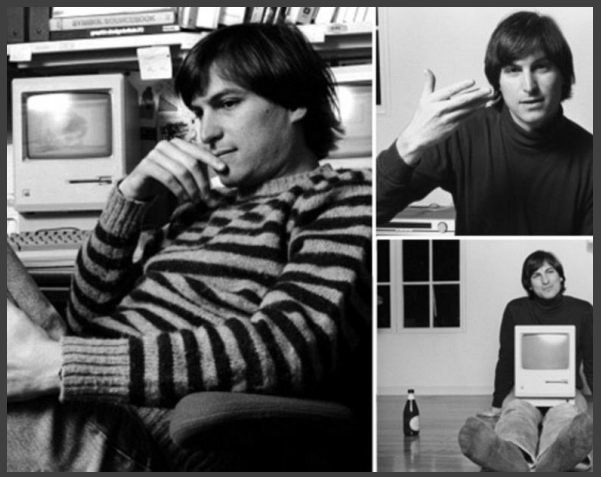

Era 1
Era 2
Era 3
Era 4
Penetration and Embedment of IT
batch computing and timesharing
mainframes
distributed computing
minis
networked personal computing
desktops
Internet Computing
open systems of clients and servers
mobile computing
pervasive / ubiquitious computing
information appliances
PDAs
wireless sensors
1960
1970
1980
1990
2000
2010
Time Frame

- (2022)Metcalfe, Robert Melancton
- (2021)Dongarra, Jack
- (2020)Aho, Alfred Vaino Ullman, Jeffrey David
- (2019)Catmull, Edwin E. Hanrahan, Patrick M.
- (2018)Bengio, Yoshua Hinton, Geoffrey ELeCun, Yann
- (2017)Hennessy, John LPatterson, David
- (2016)Berners-Lee, Tim
- (2015)Diffie, Whitfield Hellman, Martin
- (2014)Stonebraker, Michael
- (2013)Lamport, Leslie
- (2012)Goldwasser, Shafi Micali, Silvio
- (2011)Pearl, Judea
- (2010)Valiant, Leslie Gabriel
- (2009)Thacker, Charles P. (Chuck) *
- (2008)Liskov, Barbara
- (2007)Clarke, Edmund Melson *Emerson, E. Allen Sifakis, Joseph
- (2006)Allen, Frances ("Fran") Elizabeth *
- (2005)Naur, Peter *
- (2004)Cerf, Vinton (“Vint”) Gray Kahn, Robert (“Bob”) Elliot
- (2003)Kay, Alan
- (2002)Adleman, Leonard (Len) Max Rivest, Ronald (Ron) Linn Shamir, Adi
- (2001)Dahl, Ole-Johan *Nygaard, Kristen *
- (2000)Yao, Andrew Chi-Chih
- 1999)Brooks, Frederick ("Fred") *
- (1998)Gray, James ("Jim") Nicholas *
- (1997)Engelbart, Douglas *

- ((1996)Pnueli, Amir *
- (1995)Blum, Manuel
- (1994)Feigenbaum, Edward A ("Ed") Reddy, Dabbala Rajagopal ("Raj")
- (1993)Hartmanis, Juris *Stearns, Richard ("Dick") Edwin
- (1992)Lampson, Butler W
- (1991)Milner, Arthur John Robin Gorell ("Robin") *
- (1990)Corbato, Fernando J ("Corby") *
- (1989)Kahan, William (“Velvel”) Morton
- (1988)Sutherland, Ivan
- (1987)Cocke, John *
- (1986)Hopcroft, John ETarjan, Robert (Bob) Endre
- (1985)Karp, Richard ("Dick") Manning
- (1984)Wirth, Niklaus E*
- (1983)Ritchie, Dennis M.*Thompson, Kenneth Lane
- (1982)Cook, Stephen Arthur
- (1981)Codd, Edgar F. ("Ted") *
- (1980)Hoare, C. Antony ("Tony") R.
- (1979)Iverson, Kenneth E. ("Ken") *
- (1978)Floyd, Robert (Bob) W *
- (1977)Backus, John *
- (1976)Rabin, Michael O. Scott, Dana Stewart
- (1975)Newell, Allen *Simon, Herbert ("Herb") Alexander *
- (1974)Knuth, Donald ("Don") Ervin
- (1973)Bachman, Charles William *
- (1972)Dijkstra, Edsger Wybe *
- (1971)McCarthy, John *
- (1970)Wilkinson, James Hardy ("Jim") *
- (1969)Minsky, Marvin *
- (1968)Hamming, Richard W*
- (1967)Wilkes, Maurice V.*
- (1966)Perlis, Alan J *

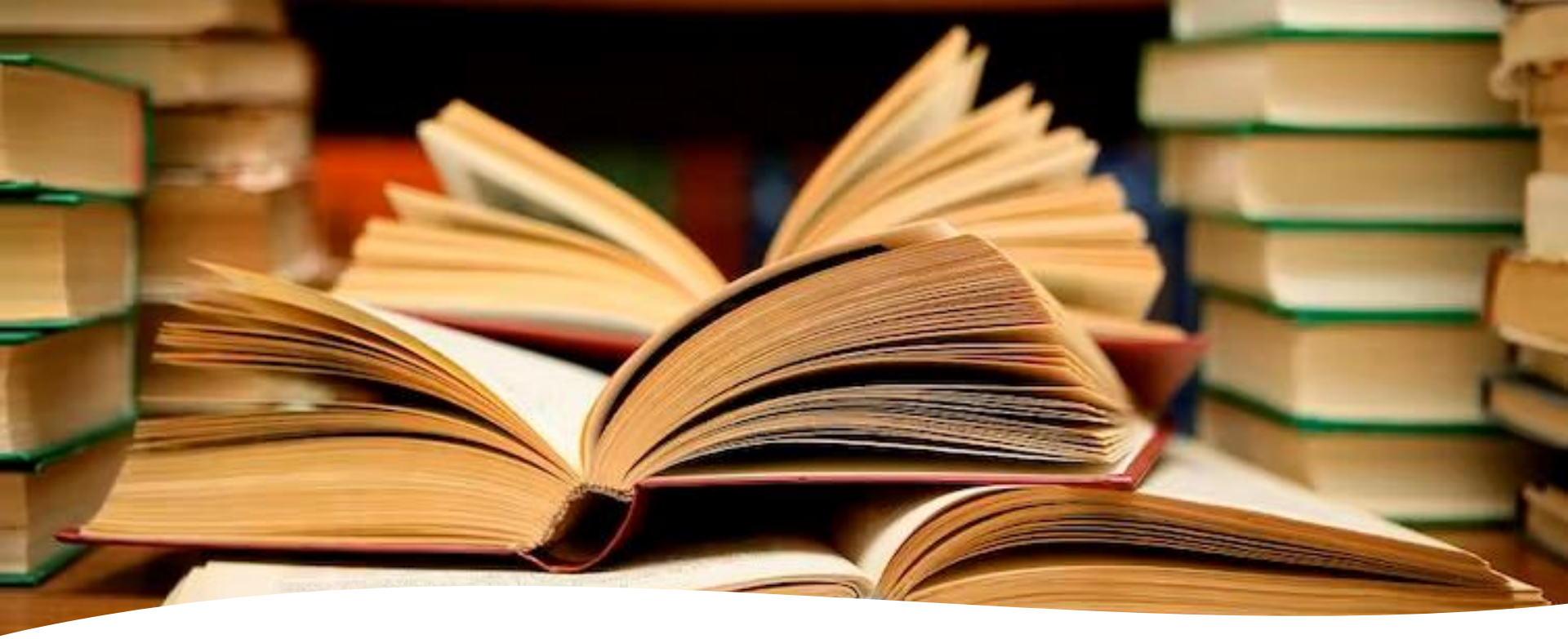
RESEARCH SUBJECT

- Artificial Intelligence
- Cryptography
- Programming Languages



IT Business

- Steve Jobs
- Bill Gates
- Mark Zuckerberg
- Jeff Bezos
- Sergey Brin
- Larry Page



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