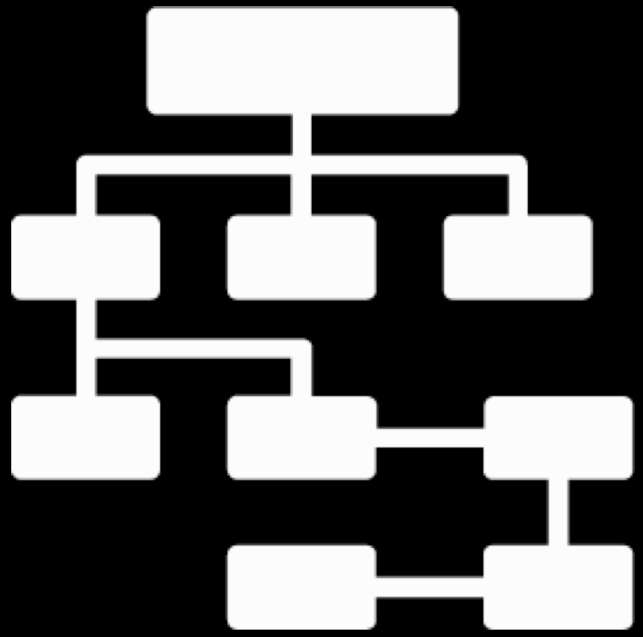


# Information Systems

The Internet | Blockchain | Artificial Intelligence

# Review: *What is a system?*

- More than the sum of its parts

- Interconnected set of elements organized in a way that achieves something

- Elements
- Interconnections
- Control/Feedback
- Function/Purpose

# What is an information system?

- An integrated set of components for collecting, storing, and processing data and for providing information, knowledge, and digital products.
- All types of organizations rely on information systems to carry out and manage their operations, interact with their customers and suppliers, process financial accounts, manage their human resources, and to reach their potential customers with online promotions.

- Many large companies are built entirely around information systems. *Can you think of any?*

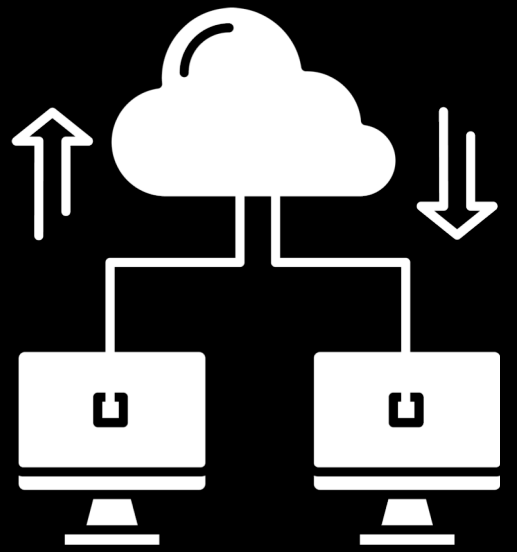
# The Internet

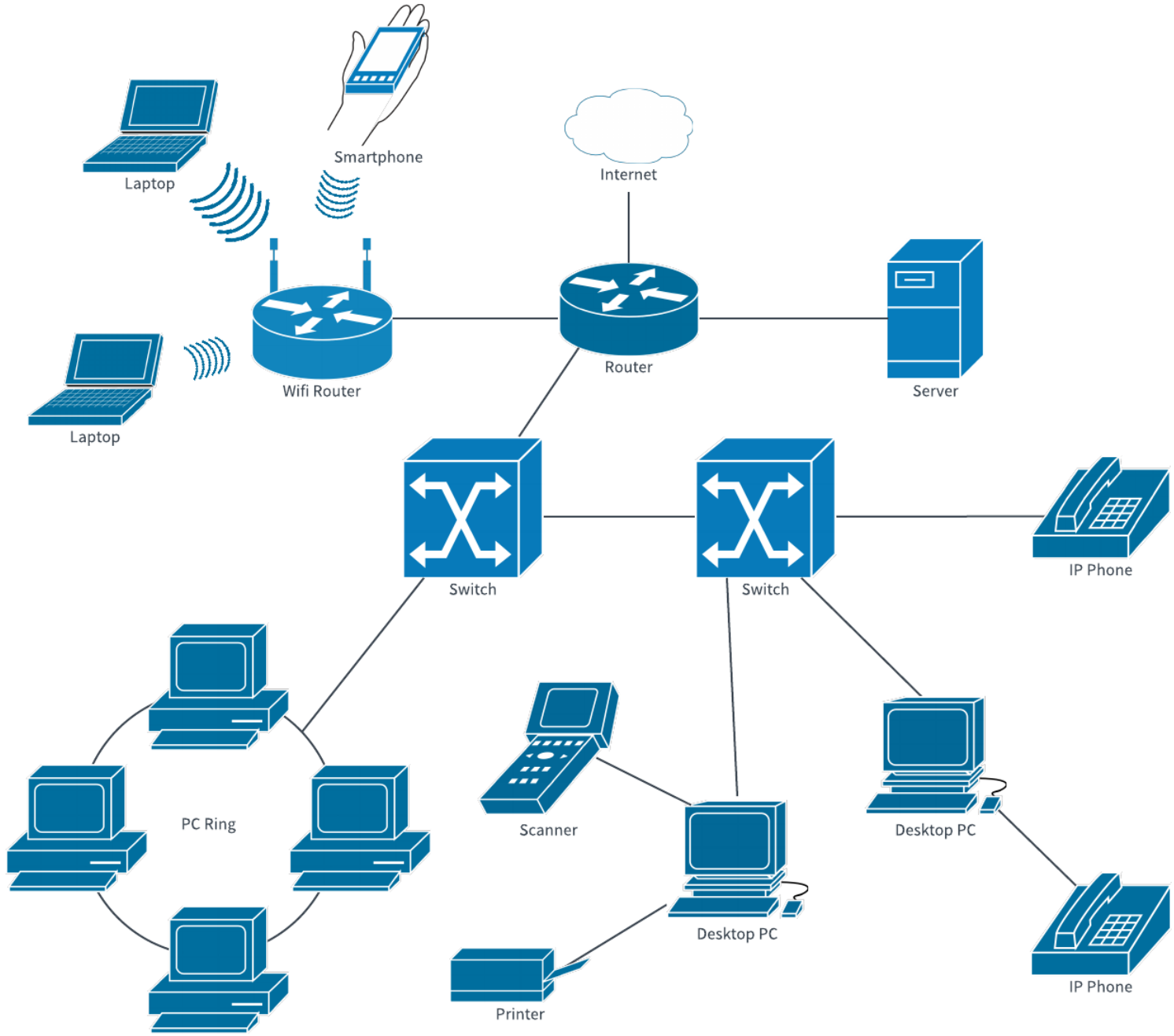
A global wide area network that connects computer systems across the world.

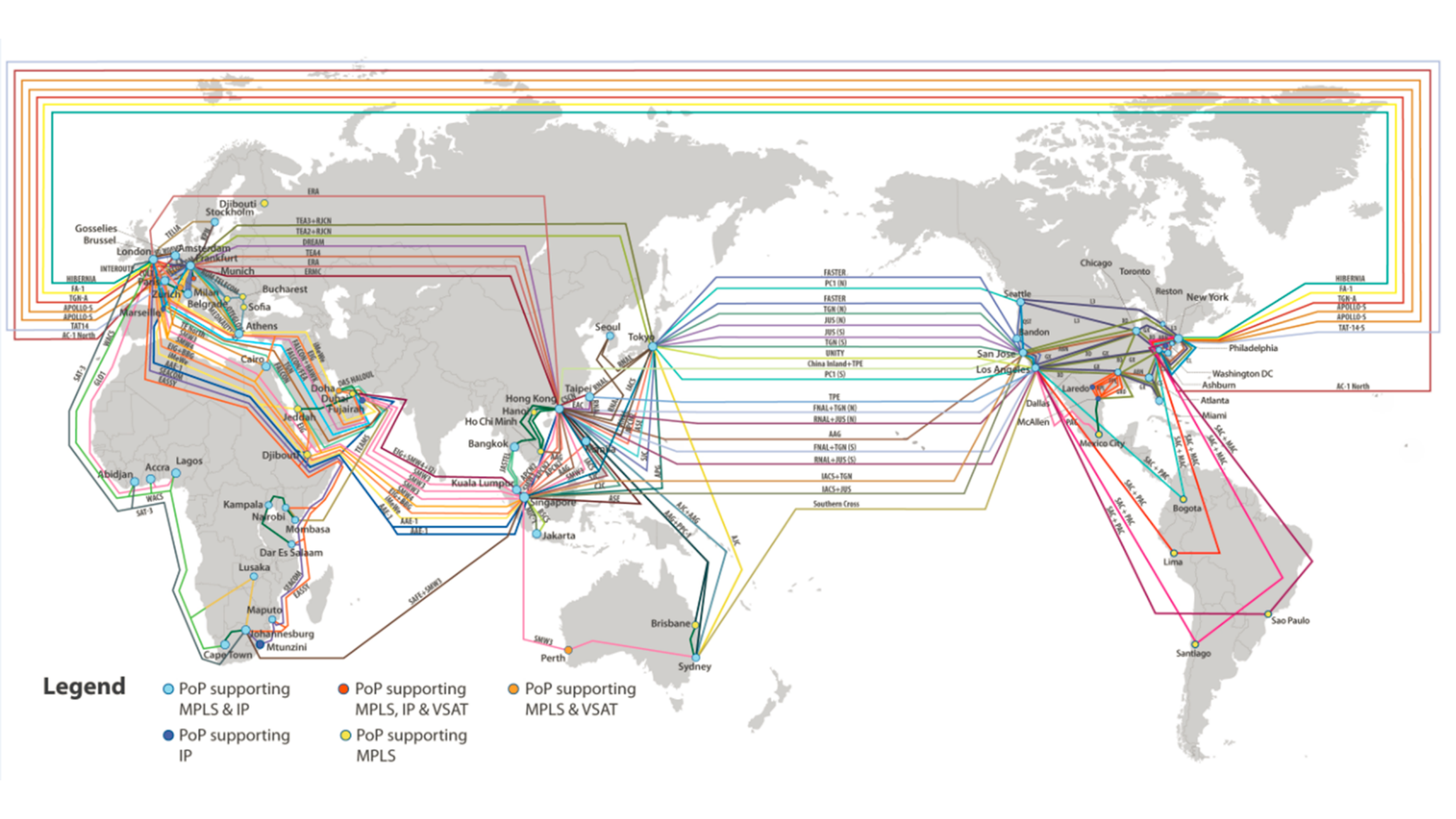
# History of The Internet

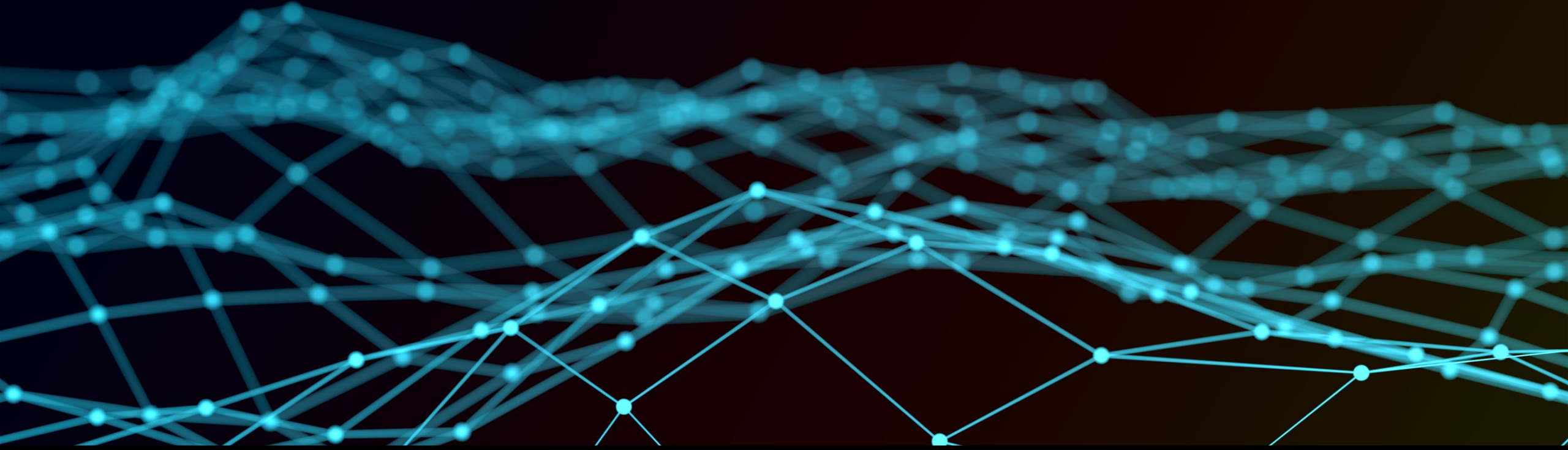
- 1970s – ARPANET (Advanced Research Projects Agency Network)
- 1990s – World Wide Web
- 1991 – ERWISE (Frist web browser)
- 1994 – Netscape Navigator (90% of web usage)

- First thing purchased on the internet?




Laptop
Smartphone
Internet
Wifi Router
Router
Server
Laptop
Switch
Switch
IP Phone
PC Ring
Scanner
Desktop PC
Desktop PC
Printer
IP Phone


Djibouti
Stockholm
Gosselies
Brussel
London
Amsterdam
Frankfurt
Munich
Paris
Zurich
Milan
Belgrade
Bucharest
Sofia
Athens
Marseille
Cairo
Doha
Dubai
Fujairah
Jeddah
Djibouti
Abidjan
Accra
Lagos
Kampala
Nairobi
Mombasa
Dar Es Salaam
Lusaka
Maputo
Johannesburg
Mtunzini
Cape Town
Seoul
Tokyo
Taipei
Hong Kong
Hanoi
Ho Chi Minh
Bangkok
Kuala Lumpur
Singapore
Jakarta
Perth
Brisbane
Sydney
Seattle
San Jose
Los Angeles
Bandon
Chicago
Toronto
Reston
New York
Philadelphia
Washington DC
Ashburn
Atlanta
Miami
Dallas
McAllen
Laredo
Mexico City
Bogota
Lima
Santiago
Sao Paulo
ERA
TEA3+RJCN
TEA2+RJCN
DREAM
TEA4
ERMC
INTEROUTE
HIBERNIA
FA-1
TGN-A
APOLLO-S
TAT14
AC-1 North
WACS
SAT-3
GLO1
TELIA
FASTER
PC1 (N)
TGN (N)
JUS (N)
JUS (S)
TGN (S)
UNITY
China Inland+TPE
PC1 (S)
TPE
FNAL+TGN (N)
RNAL+JUS (N)
AAG
FNAL+TGN (S)
RNAL+JUS (S)
IAC5+TGN
IAC5+JUS
Southern Cross
TAT-14-S
SAC + MAC
SAC + PAC
AAE-1
SEACOM
EASSY
TEAMS
SAFE+SMW3
AJC+AAG
AJC+PPC-1
AJC
Legend
PoP supporting MPLS & IP
PoP supporting MPLS, IP & VSAT
PoP supporting MPLS & VSAT
PoP supporting IP
PoP supporting MPLS



# Blockchain

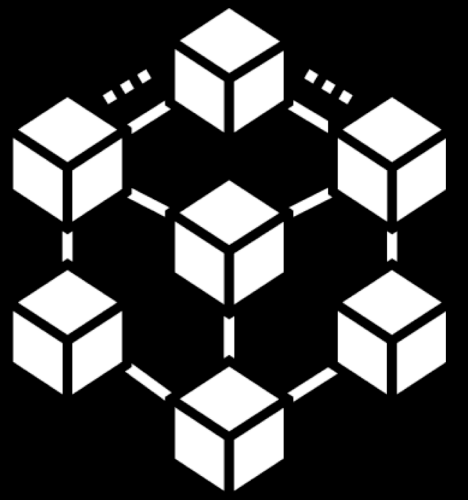
A time-stamped series of immutable records of data that is managed by cluster of computers not owned by any single entity.

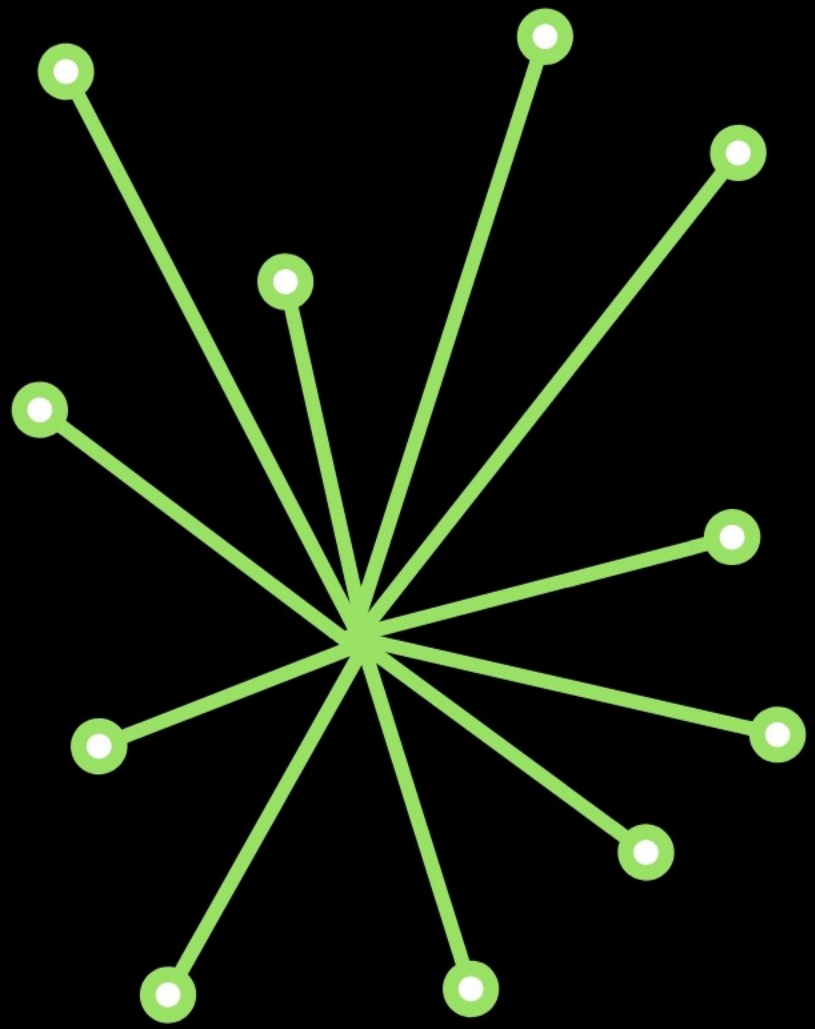
# What is Blockchain?

- “Open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way.”

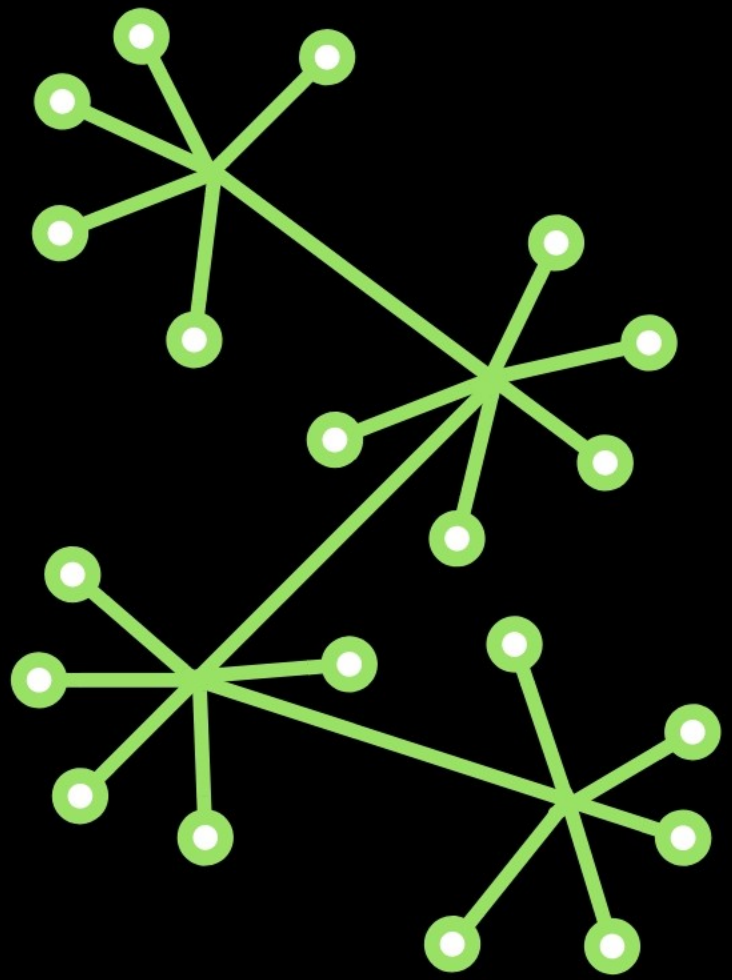
  - Open
  - Distributed
  - Ledger
  - P2P
  - Permanent

  - *2009 White Paper by Satoshi Nakamoto*

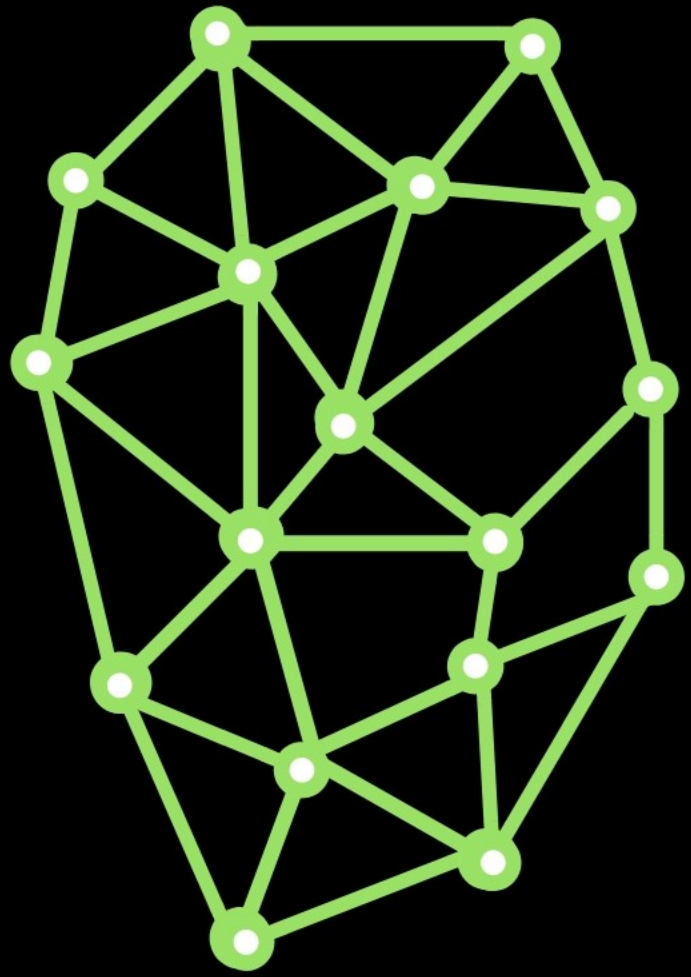




Centralized



Decentralized



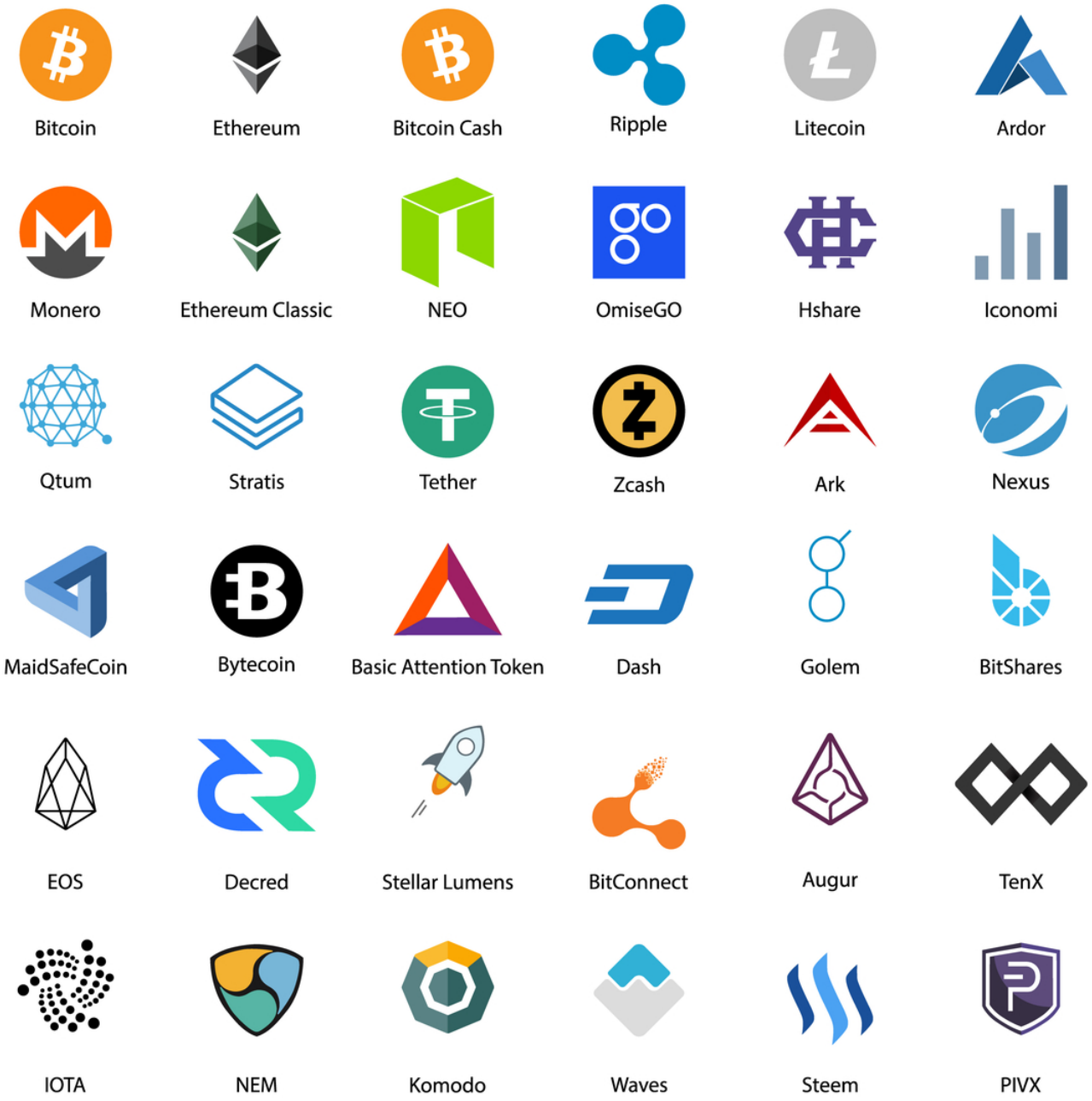
Distributed

# What does Blockchain do?

- Cryptocurrency
- Smart Contracts
- Decentralized Applications( DApp)

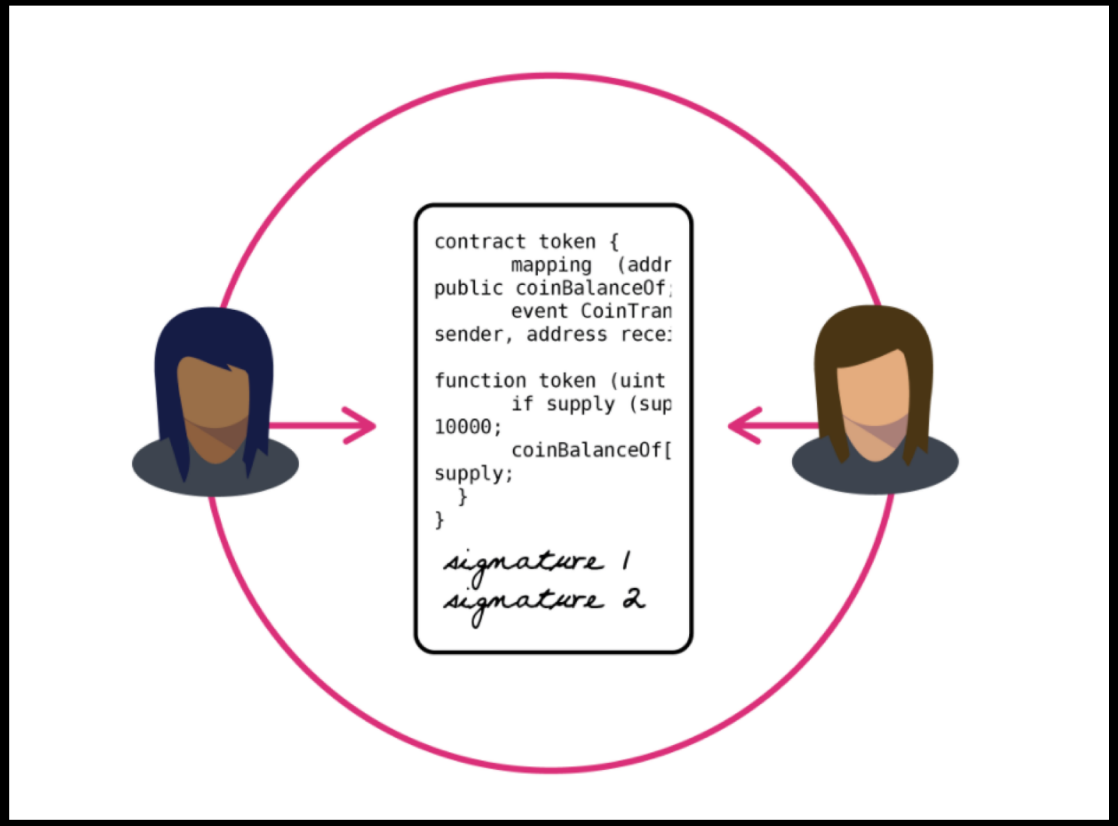
# Cryptocurrency

- Bitcoin
- Litecoin
- Ethereum
- Zcash
- Ripple
- Bitcoin Cash



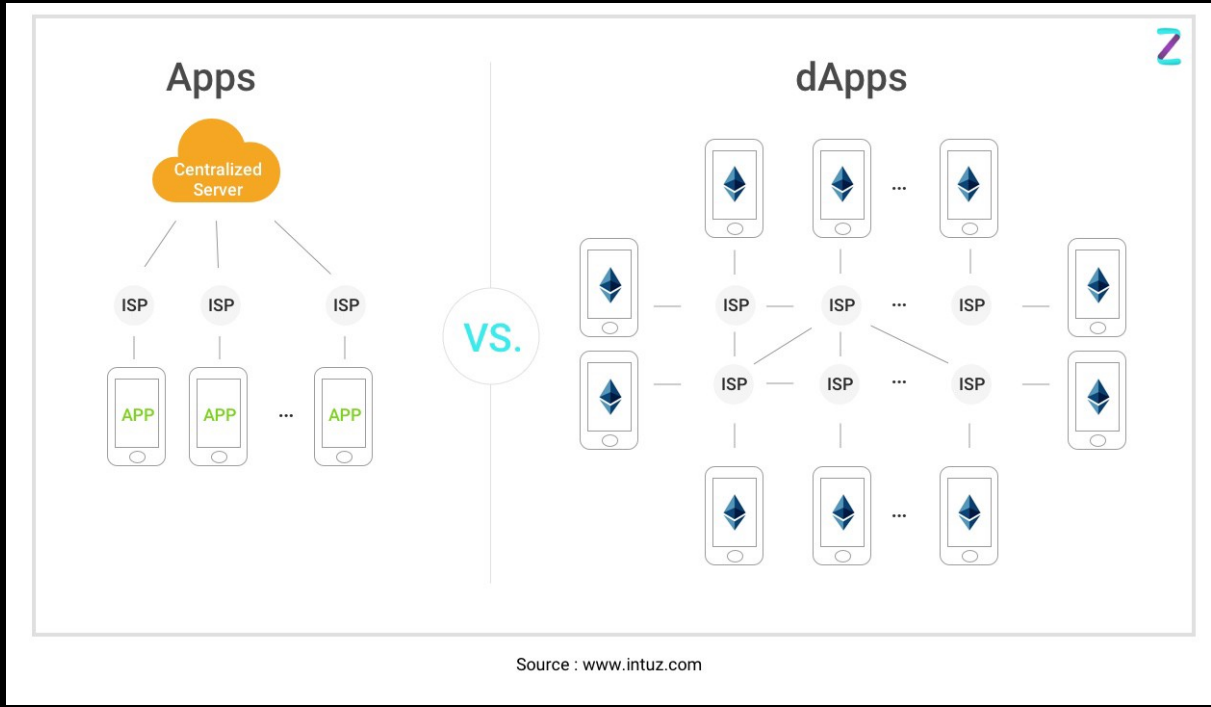
# Smart Contracts

- Coded version of *If-Then* situation that gets uploaded on the network.
- After executing all the contracts, it gets automatically updated on the ledger.
- Use cases: Stock Trading, Supply Chain Management, Real Estate Market, Voting, Healthcare Services, IoT, and more…
- DAO (Decentralized Autonomous Organization)
  - Terra0 – automated resilience systems for ecosystems



# Decentralized Applications

- Golem
- Augur
- Steemit
- CryptoKitties




- *www.stateofthedapps.com*

Vox

# Current Issues

- Environmental Cost
- Lack of regulation
- Complex
- Slow (Specifically for small transactions)
- The established financial industry has a vested interest in it failing

## CRYPTO MINING — PER YEAR

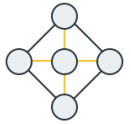
**114** countries

**~100,000** miners

**$4.1 bln** — miners revenue

**~$2 bln** — GPU cards producers' profit
**~$3 bln** — big ASIC miners manufacturers' profit

**0.13%** of all the electricity consumed



**9,965** nodes

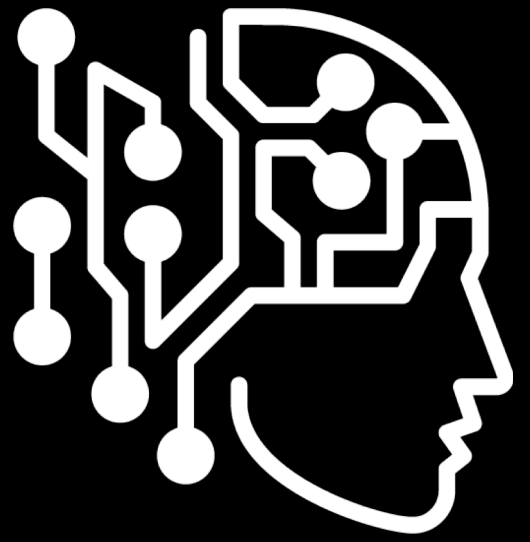
# Artificial Intelligence

A machine completing the tasks which involve a certain degree of intelligence which was previously deemed only to be done by humans.

# Types of A.I.

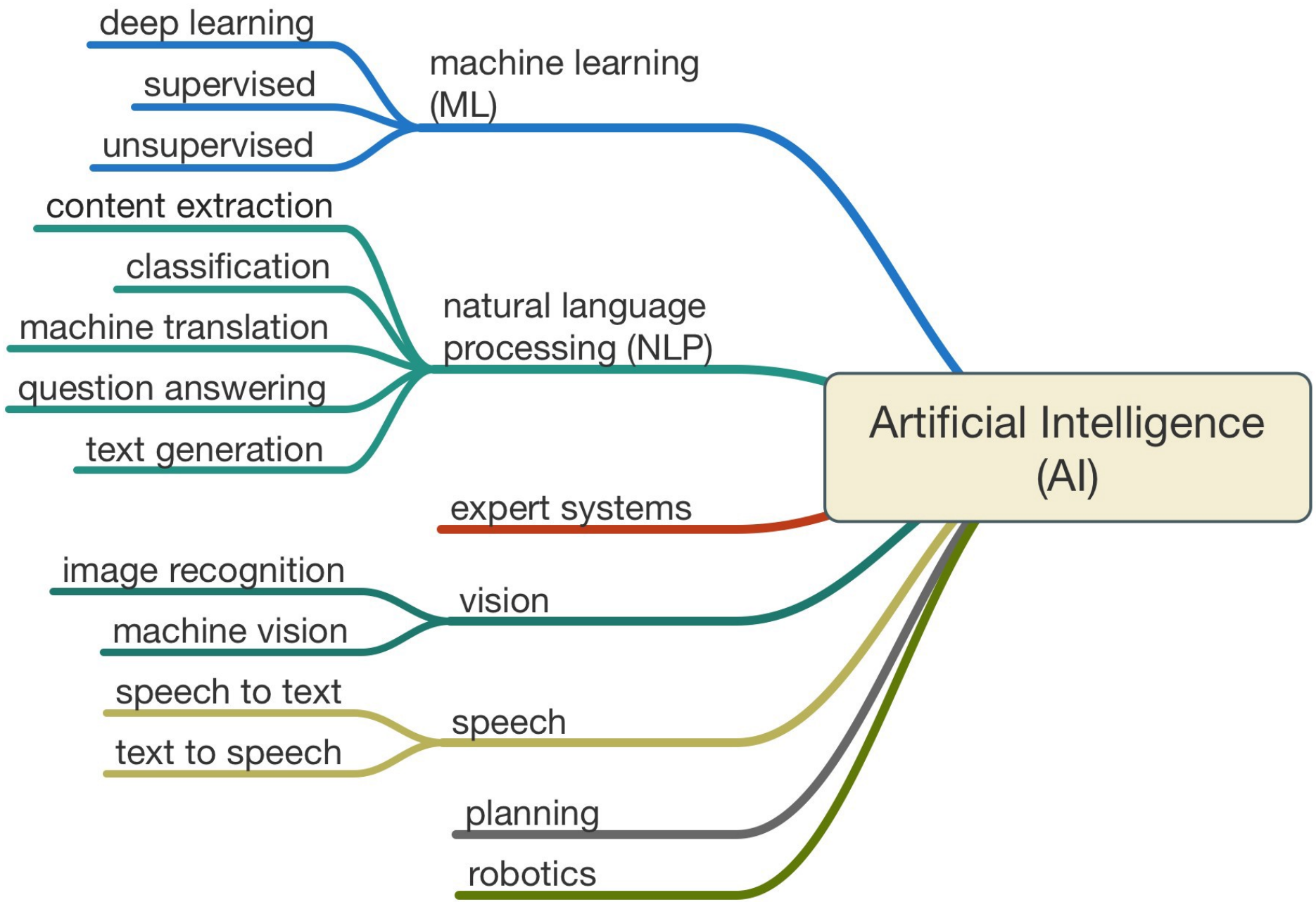
- Reactive Machines
- Limited Memory
- Theory of Mind
- Self-Awareness

- Artificial Narrow Intelligence (ANI)
- Artificial General Intelligence (AGI)
- Artificial Superintelligence (ASI)



# Current Applications

- Machine Learning
- Natural Language Processing
- Vision
- Robotics
- Autonomous Vehicles


Artificial Intelligence (AI)
machine learning (ML)
deep learning
supervised
unsupervised
natural language processing (NLP)
content extraction
classification
machine translation
question answering
text generation
expert systems
vision
image recognition
machine vision
speech
speech to text
text to speech
planning
robotics

# Machine Learning

- Target (Goal)
- Steps to Reach (Learned)
- Training (Gaining Experience)

- Much like the way a child learns to identify and classify objects

- Examples include: image recognition, medical diagnosis, structured data extraction

# Natural Language Processing

- Automatic manipulation of natural language
- Based on syntax and semantics

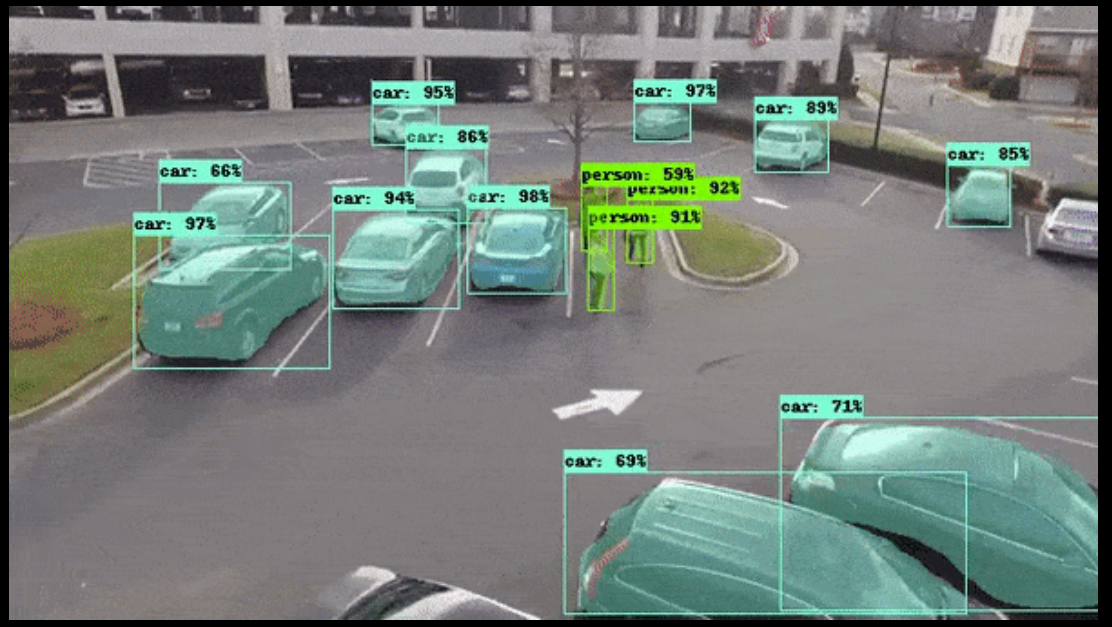
- The ultimate objective is to read, decipher, understand, and make sense of the human languages in a manner that is valuable

- Examples include: spell check, autocomplete, voice text messaging, and sentiment analysis

Alexa,
Ask
Daily Horoscopes
about
Taurus
wake word
launch
Invocation name
utterance

# Computer Vision

- Uses camera to see and machine learning to analyze different components of visual information
- Pattern recognition
- Not bound by human limitations

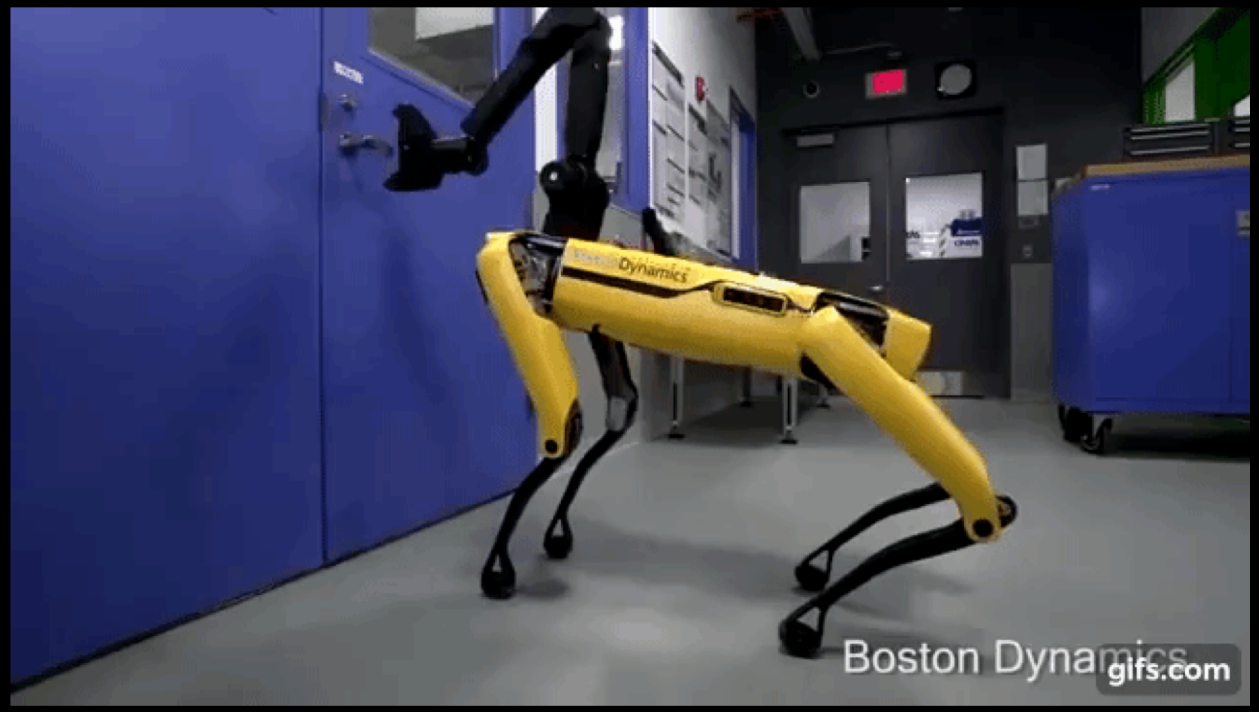



- Examples include: assisted cruise control, facial recognition, real-time sports tracking

# Robotics

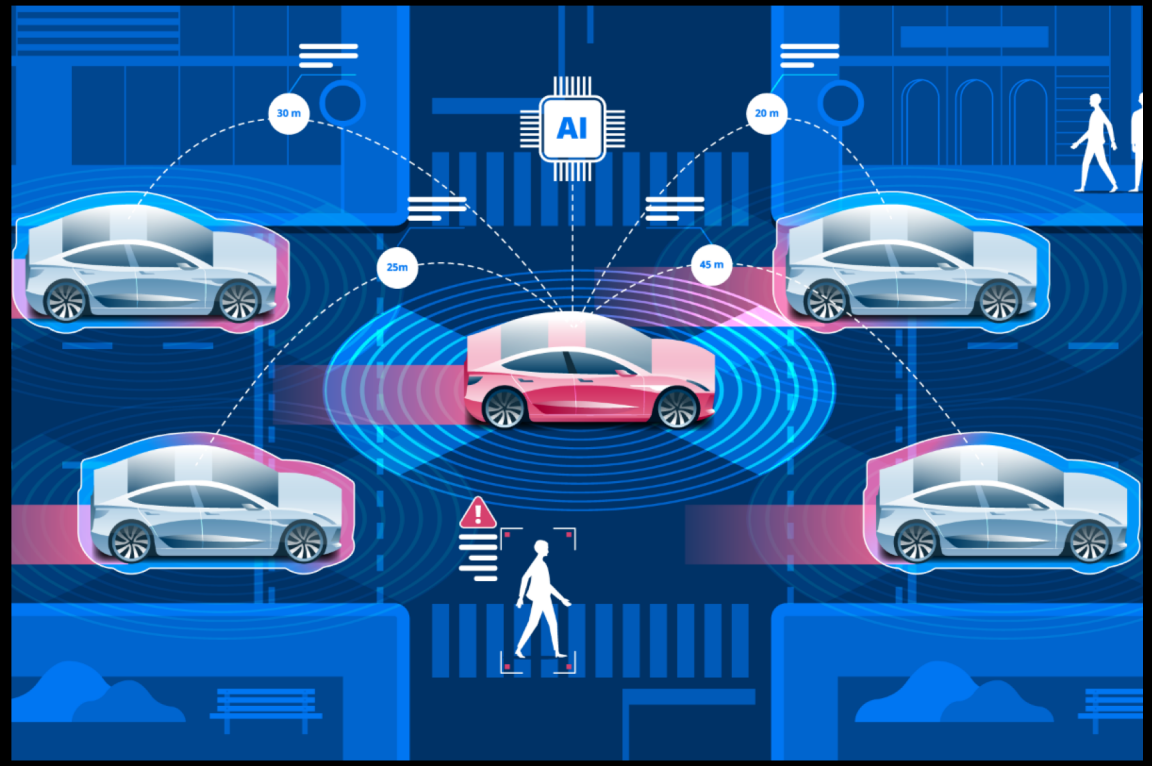
- Used to perform tasks that are difficult to perform or perform consistently

- Examples include: Roomba, Boston Dynamics Spot, assembly lines, social humanoid robots (Sophia)



# Autonomous Vehicles

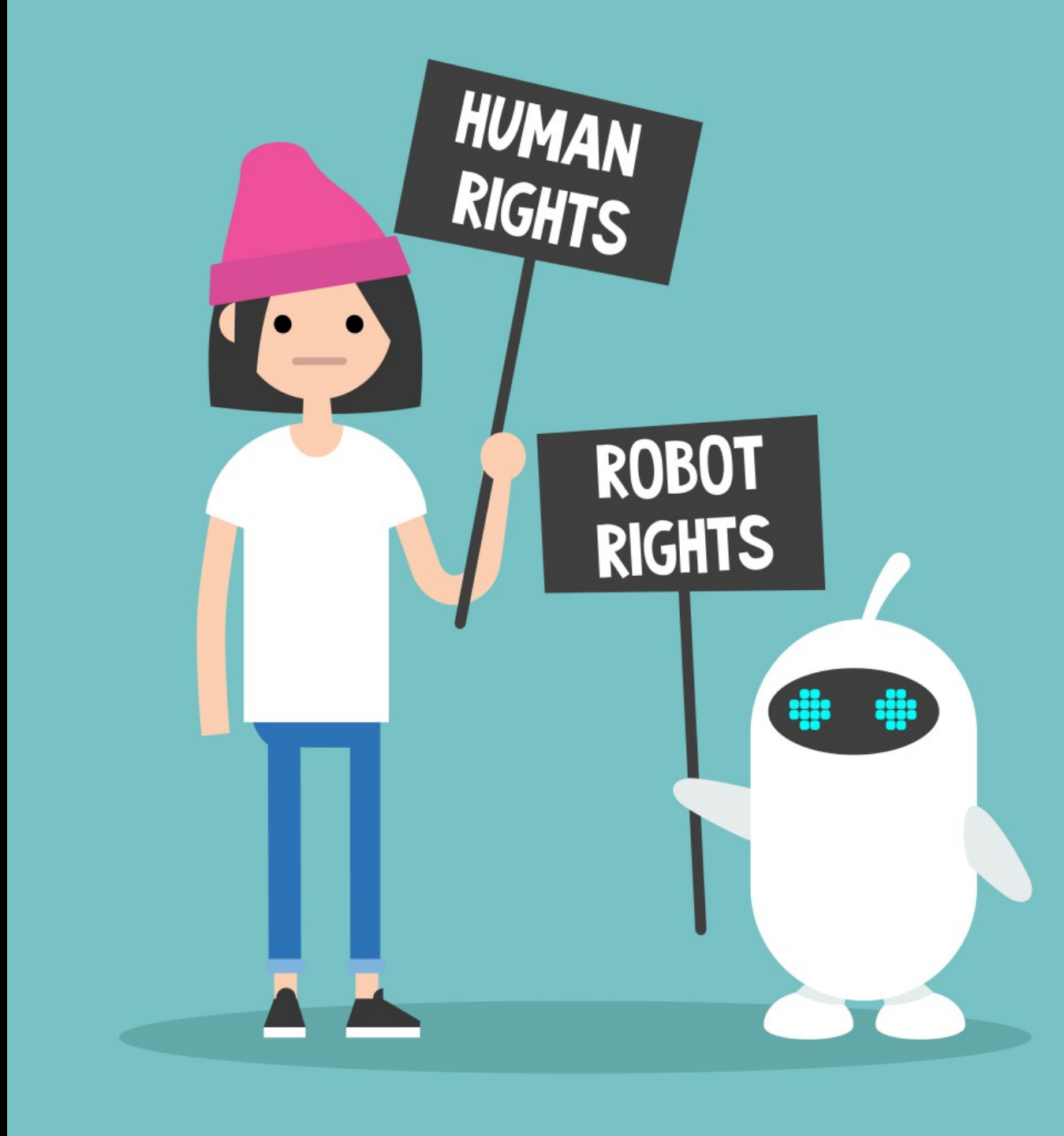
- A vehicle that can guide itself without human conduction
- It’s not just for cars
- The idea has been talked about since the 1930s
- The Trolley Problem




- Examples include: passenger vehicles, transportation vehicles, trains, ships

# Current Issues

- Artificial stupidity
- Racist robots/software
- Security
- Robot rights
- Potential for unemployment
- Singularity



# Questions…

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