



Blockchain meets Machine Learning: is it going to be love?

A peek into the technologies and their possible
convergence



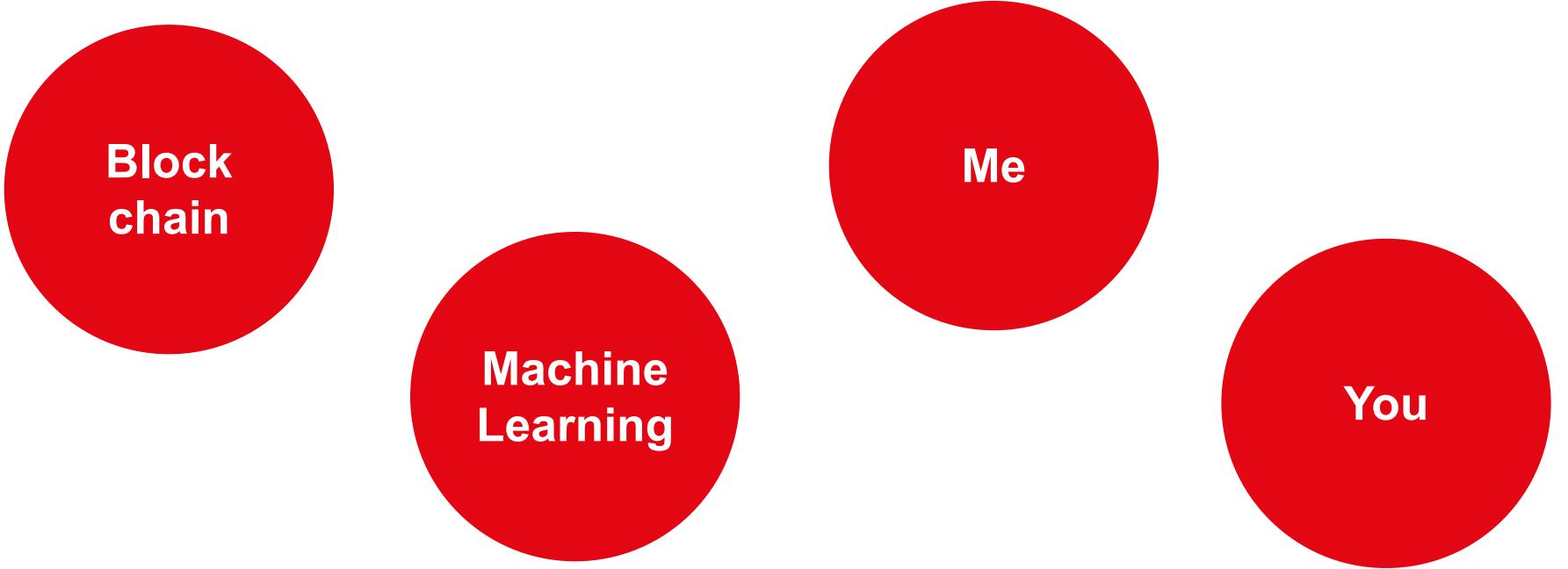
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- BS in Telecommunication engineering
- MS in ICT & Internet engineering
- Exchange semester in Germany
- Worked as cybersecurity engineer in a multinational company
- PhD at the Department of Informatics, University of Oslo

Brief outline



Block
chain

Machine
Learning

Me

You

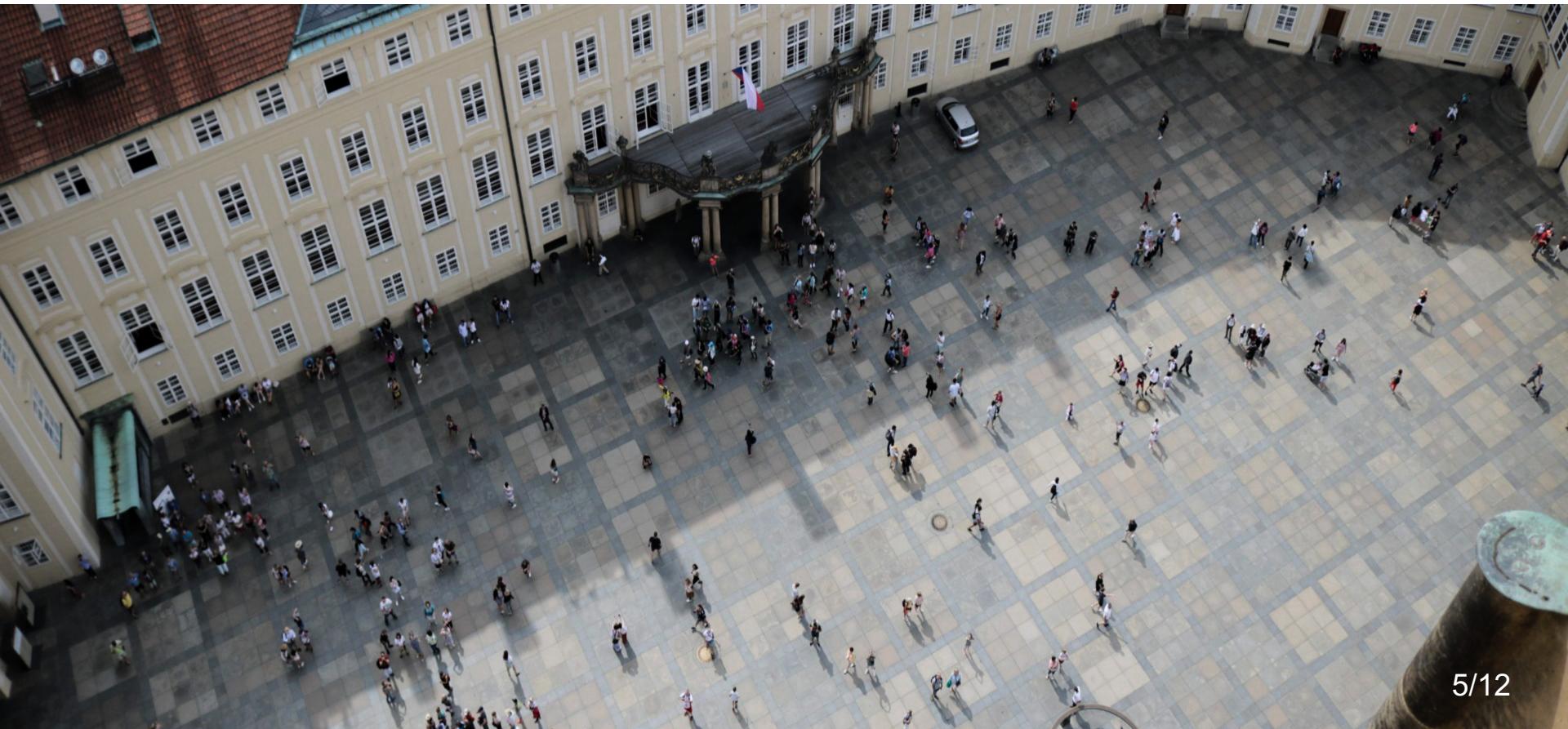
Rai stones in Yap island



There is no intrinsic value in the stone itself



Total order



Blockchain

- System that provides **value** and **total order**
- Several blockchain properties are related to the process of solving a cryptopuzzle (a mathematically hard problem)

Crypto
puzzle

Value

Secure

Total
order

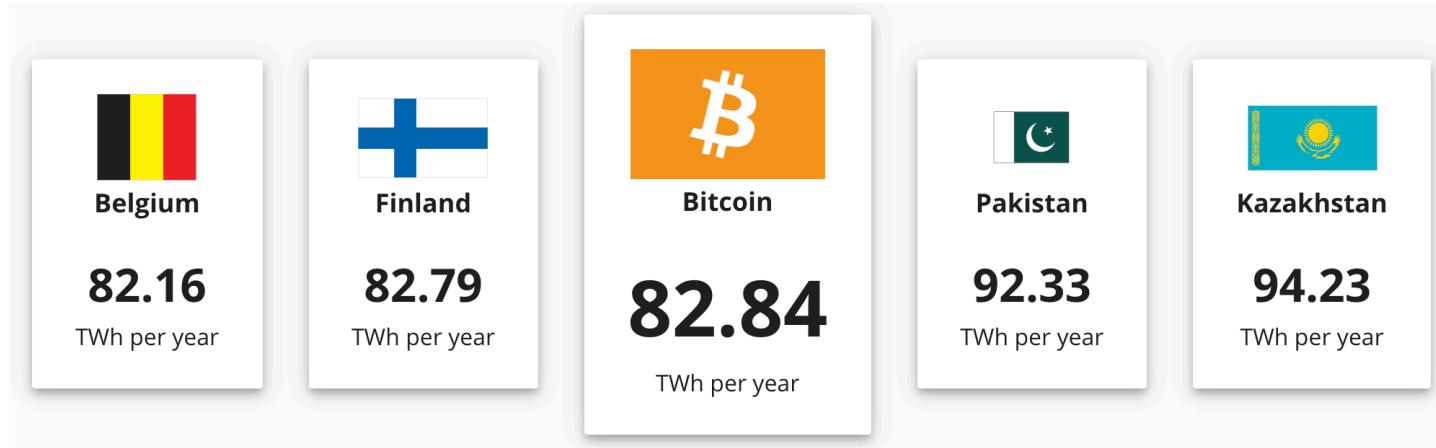
Transparent

Decentralized

Anonymous

Distributed

Cryptopuzzle energy consumption



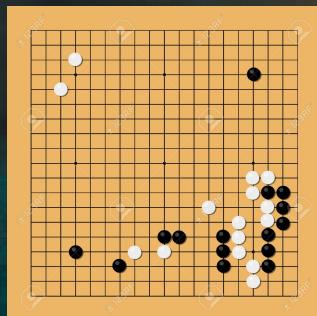
- **Norway:** 147,5% of Bitcoin's consumption
- **Sweden:** 161% of Bitcoin's consumption

The cryptopuzzle is **wasteful**:
It does not serve anything else beside the blockchain itself

- Can we do better?

Machine Learning

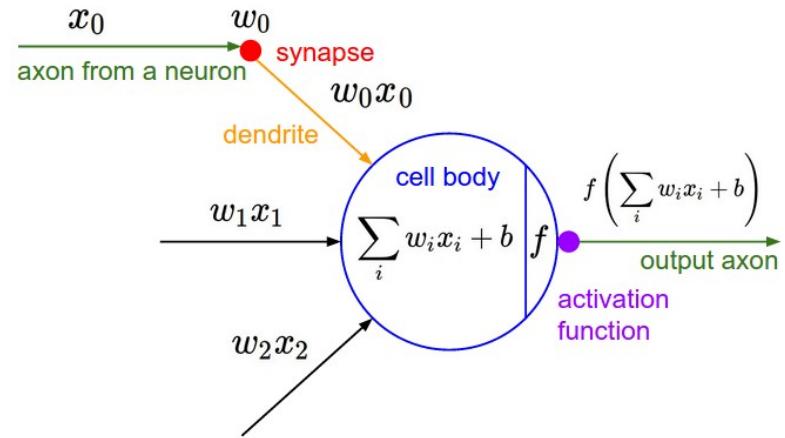
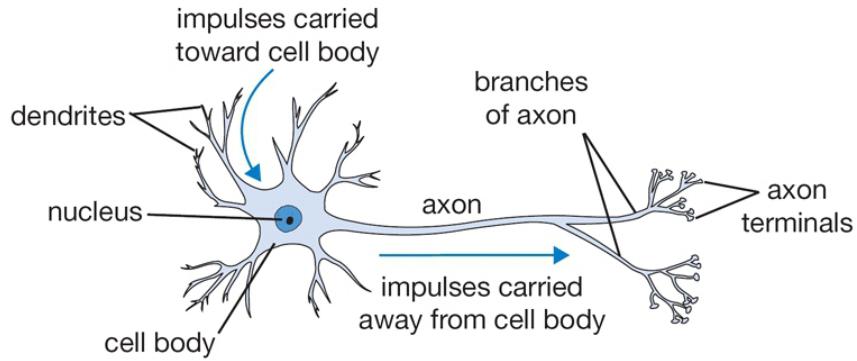
- The ability (by a machine) to perform a specific task **without being explicitly programmed** (by a human) but relying instead on self-learned patterns
- Many recent technological advancements are thanks to Neural Networks



STAR CRAFT®



Biological and artificial neurons



What I am doing for my PhD

- **Observation:** both Blockchain and Machine Learning are energy and computation intensive
- **Goal:** replace the cryptopuzzle with the training of Neural Networks
 - Not straightforward: several requirements to satisfy
- **Gain:** a more efficient system that:
 - Transfers value in a secure and orderly manner
 - Contributes to Machine Learning development



My advices

- Follow your curiosity and passions
- You can connect the dots only looking backward
- Don't fear change: take moderate risks





Thank you
and
good luck

