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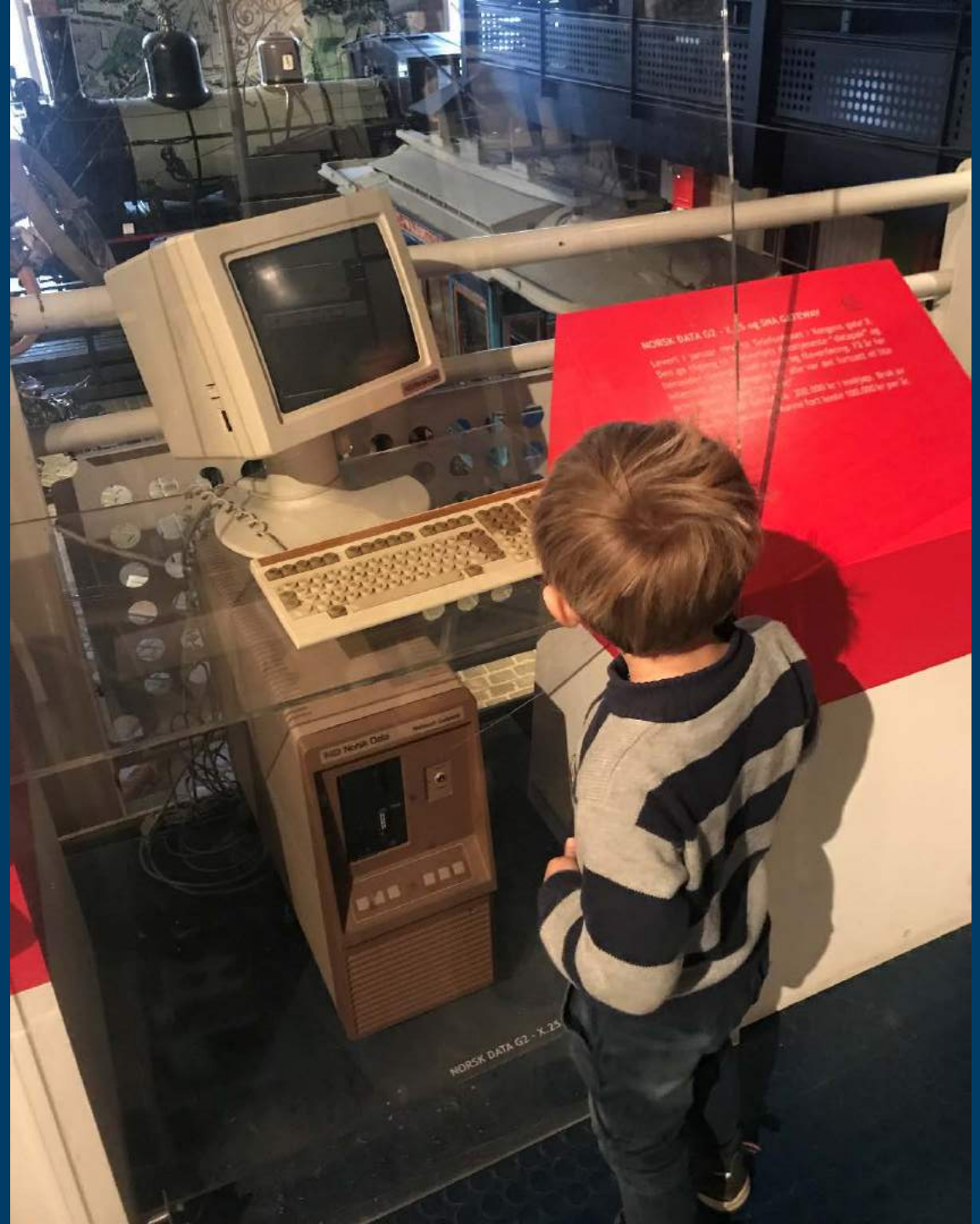
KUNSTIG INTELLIGENS – MULIGHETER FOR NORGE

NTVA julemøte
10.desember 2018
Anne Marthine Rustad



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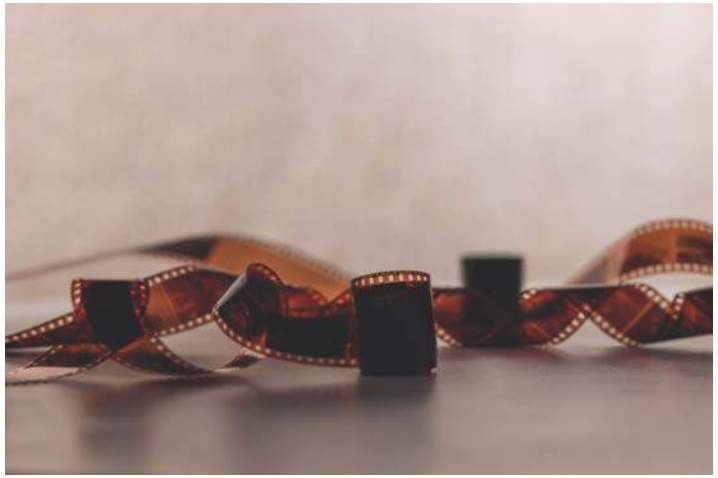
Digitizing media and travel



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Why now?

Three paradigm shifts at once

Data

Technology

Analytics

Artificial intelligence

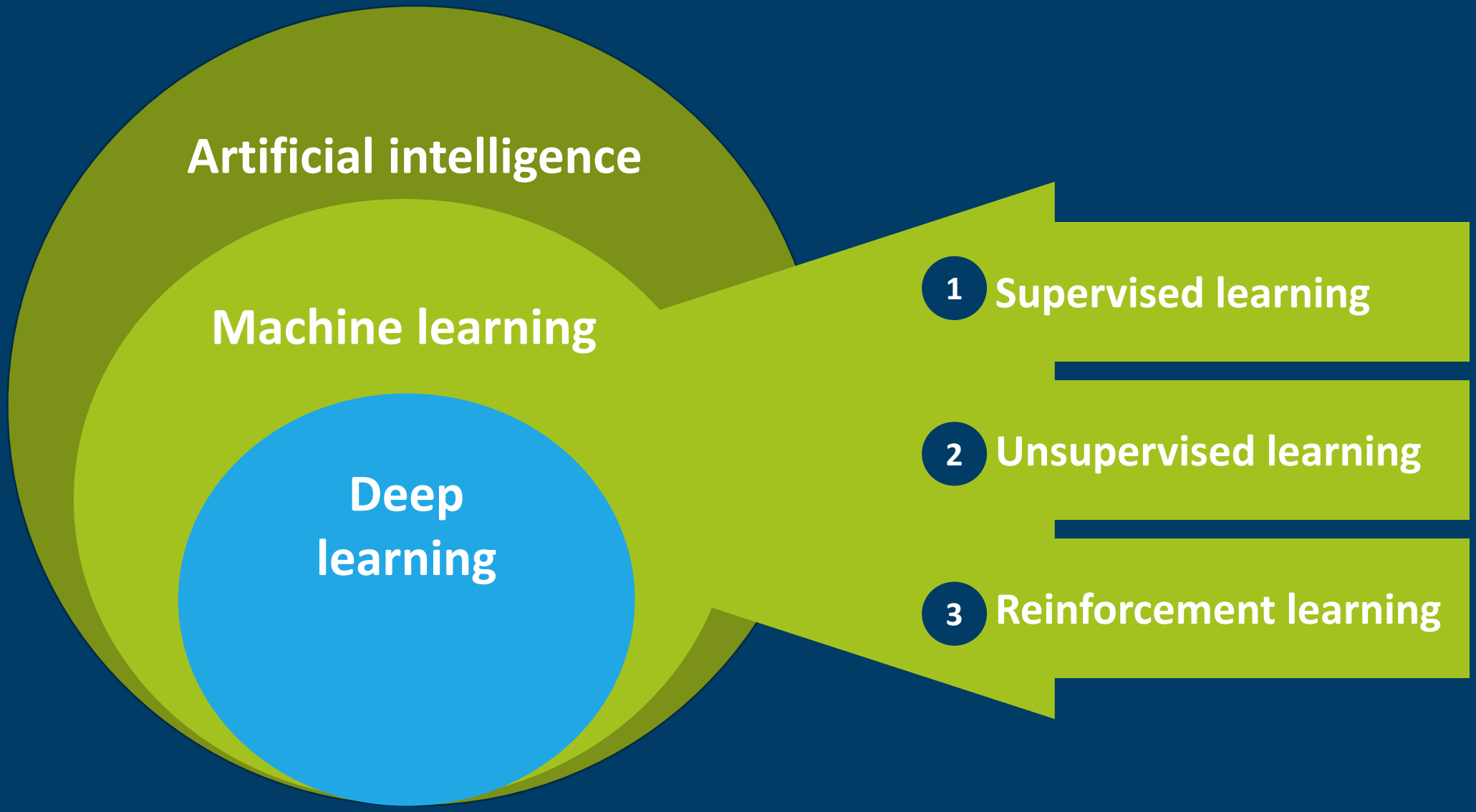
i am ai

Artificial Intelligence is the New Electricity—Andrew Ng

AI guru Ng: Fearing a rise of killer robots is like worrying about overpopulation on Mars

Baidu's deep-learning genius says he won't bother to work against an evil AI

Elon Musk: 'Mark my words — A.I. is far more dangerous than nukes'


Artificial intelligence
Machine learning
Deep learning
1 Supervised learning
2 Unsupervised learning
3 Reinforcement learning

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Supervised learning

Duck Duck Rabbit Hedgehog

Supervised learning

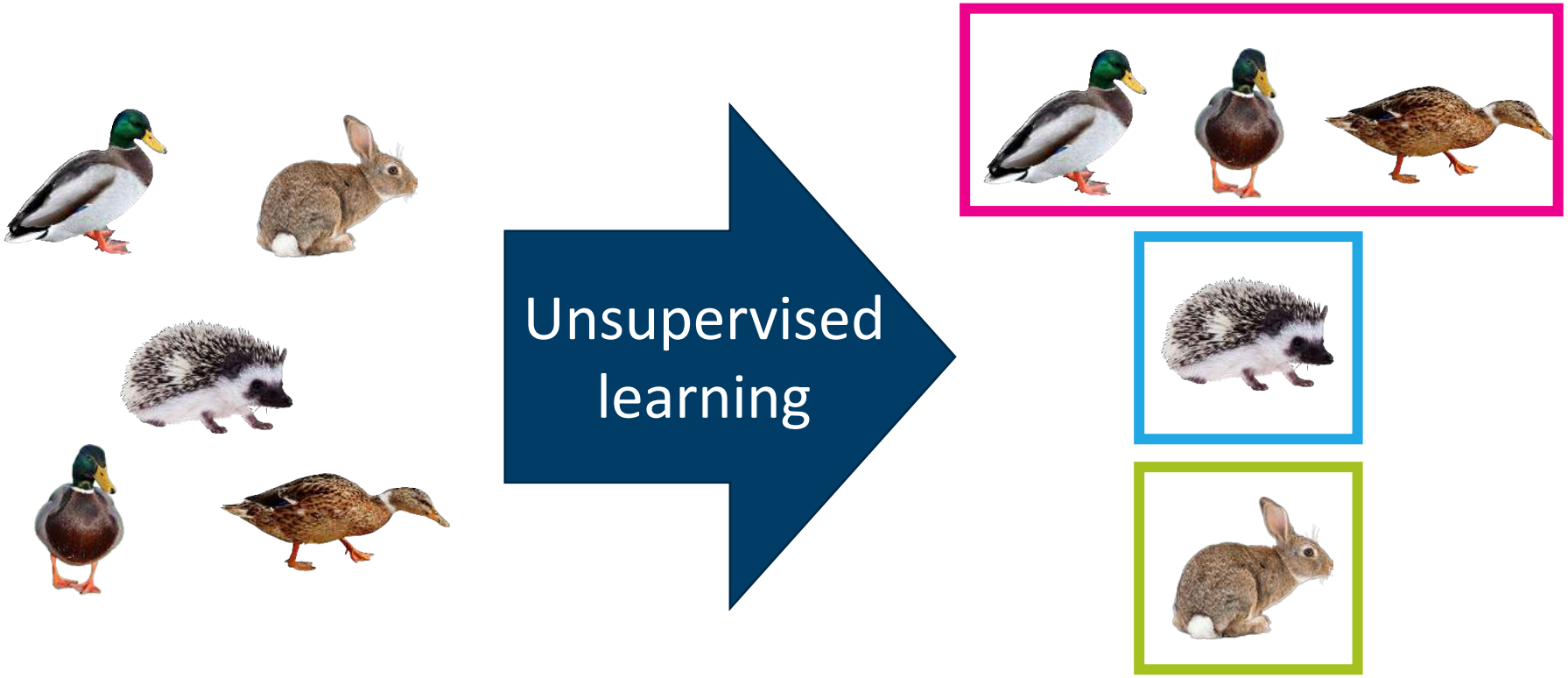
Predictive model

?

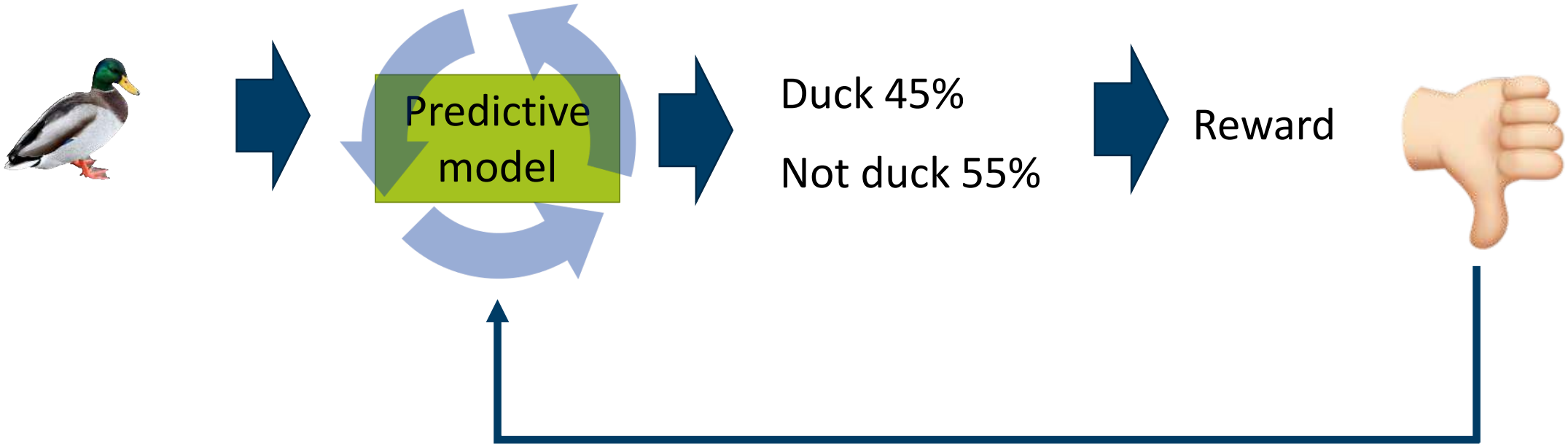
Predictive model

Duck

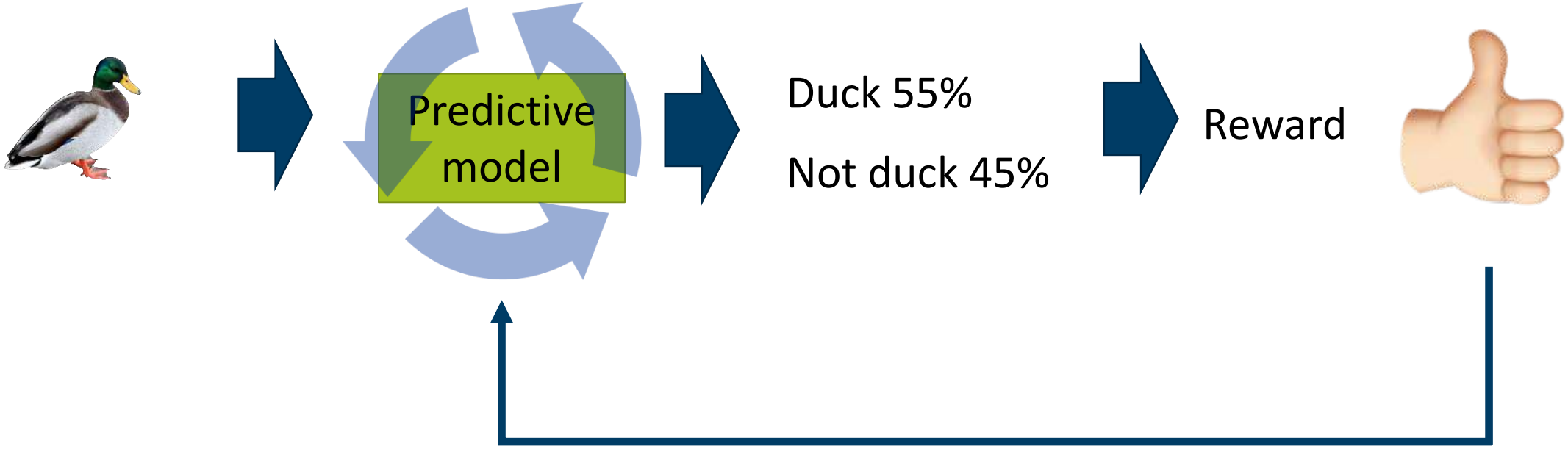
Unsupervised learning



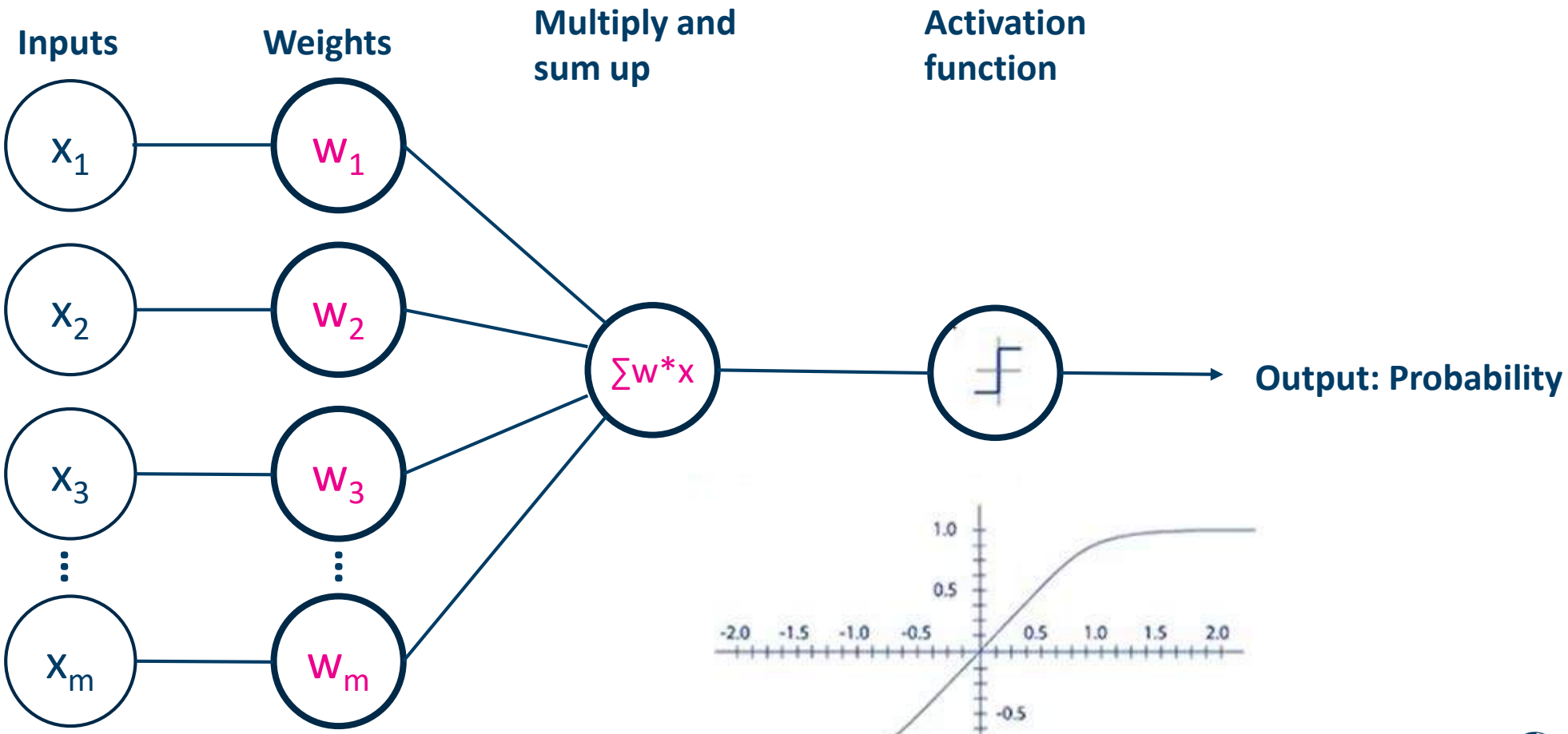
Reinforcement learning



Reinforcement learning



Artificial neural nets



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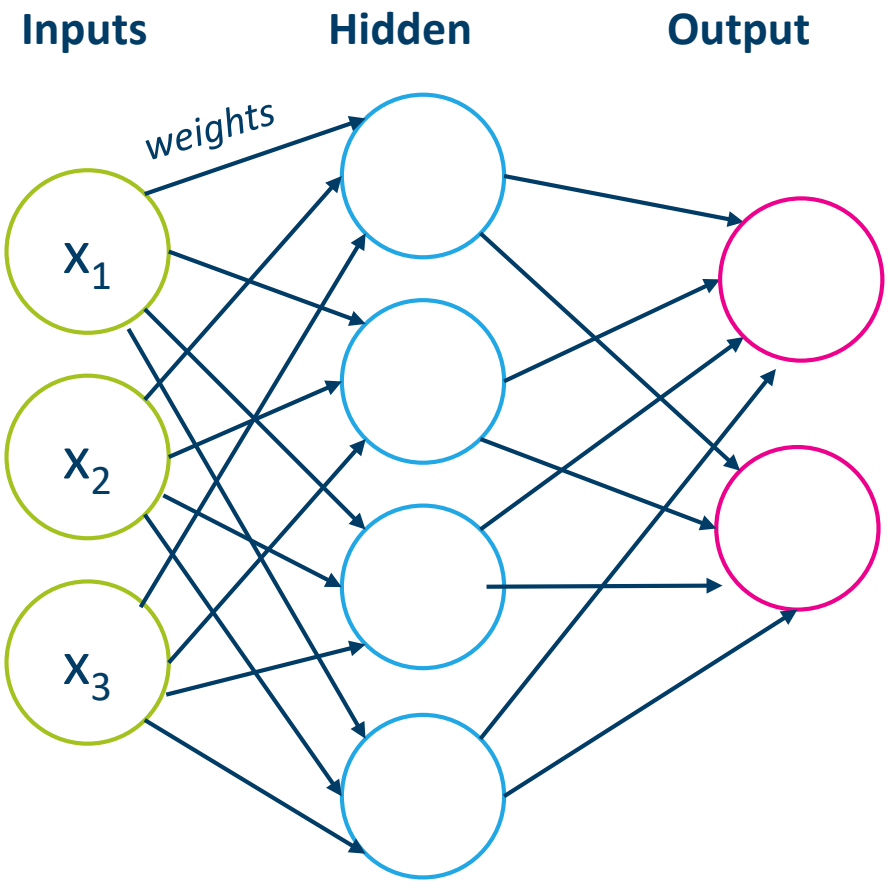
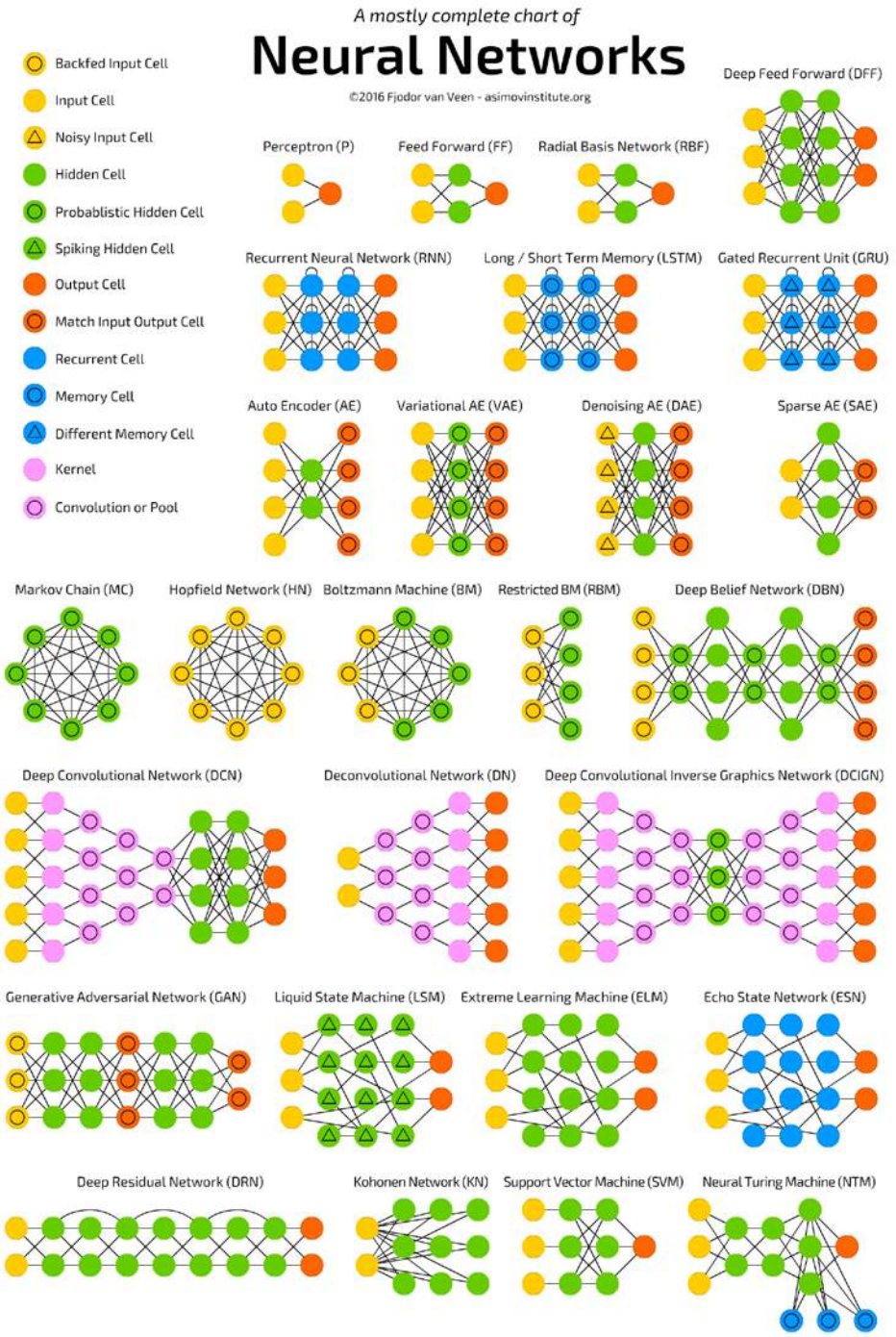
Artificial neural nets





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AI every day

Search engines

Filters

Media suggestions

Online shopping

Assistants

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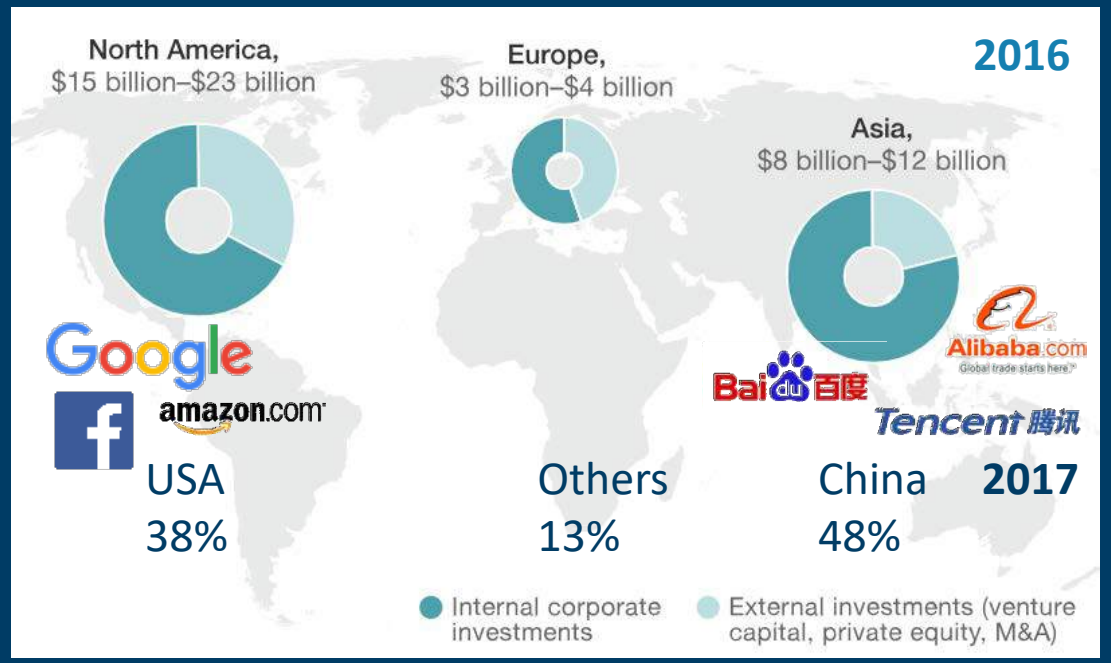
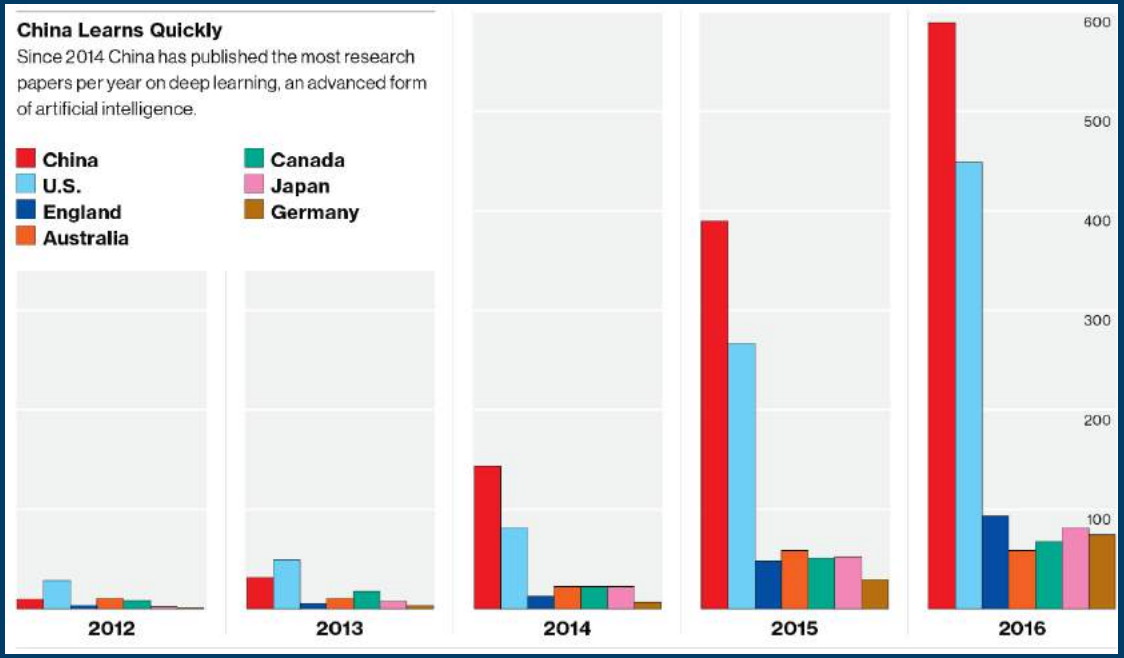
Global race on AI

China and USA dominate investments on AI



Publications on deep learning



Source: McKinsey Global Institute (2017) "10 imperatives for Europe in the age og AI and automation" https://www.mckinsey.com/featured-insights/europe/ten-imperatives-for-europe-in-the-age-of-ai-and-automation, Statista CB insight: Share of global AI startup finance funding in 2017, MIT Technology Review (2017) "Who is winning the AI race?" https://www.technologyreview.com/s/608112/who-is-winning-the-ai-race/

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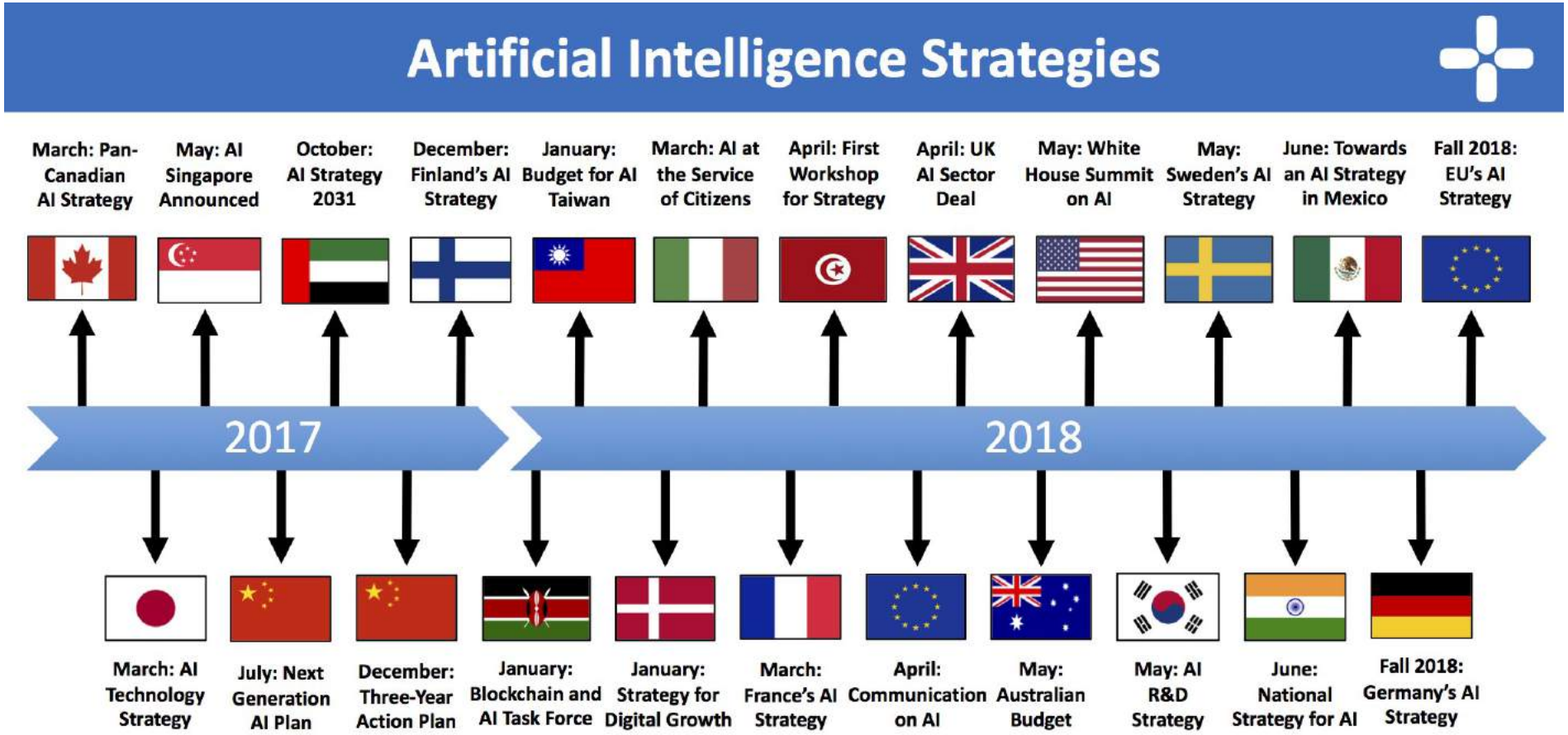
20+ countries with AI strategies last years



Source: Tim Dutton Politics +AI https://medium.com/politics-ai/an-overview-of-national-ai-strategies-2a70ec6edfd

digital 21

Digitale grep for norsk verdiskaping
Samlede anbefalinger

Digitaliseringen er allerede i ferd med å få stor betydning for både samfunnslivet og næringslivet. Den blir gjennomgripende – den er en industriell revolusjon. Da må vi møte den som det – både for å håndtere utfordringene den fører med seg for bedrifter og enkeltindivider, men ikke minst for å utnytte alle de mulighetene den gir.

Et karakteristisk trekk ved digitalisering er at den skjer og utvikles uavhengig av tradisjonelle næringer og sektorer. Den griper inn uavhengig av måten vi som samfunn er organisert på. Den griper inn på tvers. Vi kan ikke løse utfordringene og utnytte mulighetene ved å operere utelukkende parallelt innenfor de næringene eller organiseringene vi er kjent med. Det er dessuten dårlig utnyttelse av våre ressurser.

Det betyr at vi må tenke annerledes om organisering. Vi må bygge kompetanse på tvers – vi må utvikle teknologier som fungerer på tvers – vi må utvikle bedrifter som opererer på tvers – vi må utvikle regelverk på tvers – og vi må sørge for at forvaltningen også kan operere på tvers.

Digital21 har gjennom ett år sett på hvordan dette kan gjøres på en måte som kommer hele bredden av næringslivet til gode, og som bidrar til at næringslivet kan utvikle og ta i bruk ny teknologi og nye løsninger i takt med digitaliseringen.

- **Internet of Things**
- **Big Data**
- **Artificial Intelligence**
- **Autonomous systems**

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Norwegian Open AI Lab

telenor KONGSBERG DNV·GL DNB equinor SINTEF NTNU norwegian open ai lab

Memorandum of Understanding

For "Building European AI"

With
Danish Technological Institute (DENMARK),
Finnish Center For AI / VTT (FINLAND),
HUB France IA (FRANCE),
AppliedAI Initiative / UnternehmerTUM (GERMANY),
Application Center for AI / Fortiss (GERMANY),
SINTEF (NORWAY),
Norwegian Open AI Lab (NORWAY),

Wolf or husky?

Predicted: Wolf
True: Wolf

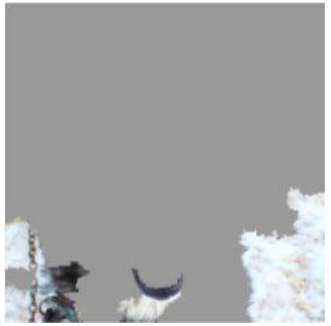
Predicted: Husky
True: Husky

Predicted: Wolf
True: Wolf

Predicted: Wolf
True: Wolf

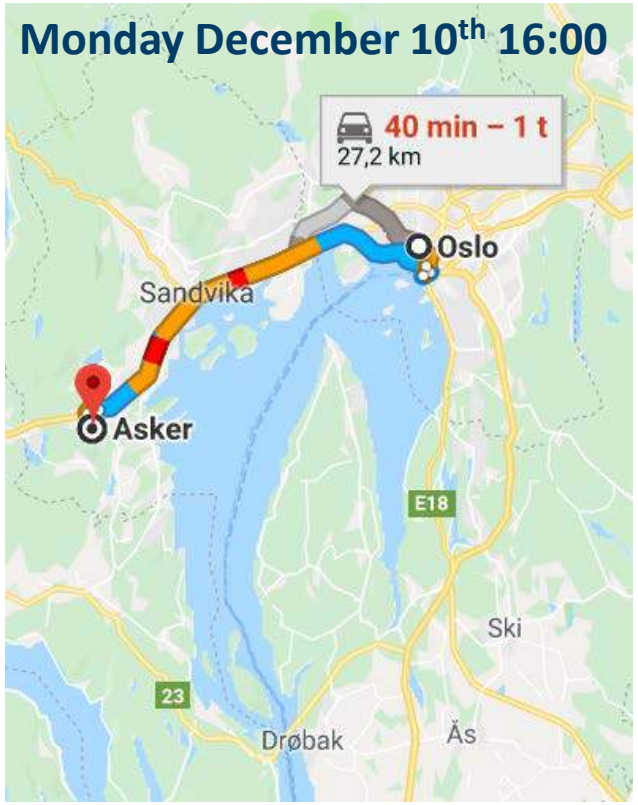
Predicted: Husky
True: Husky

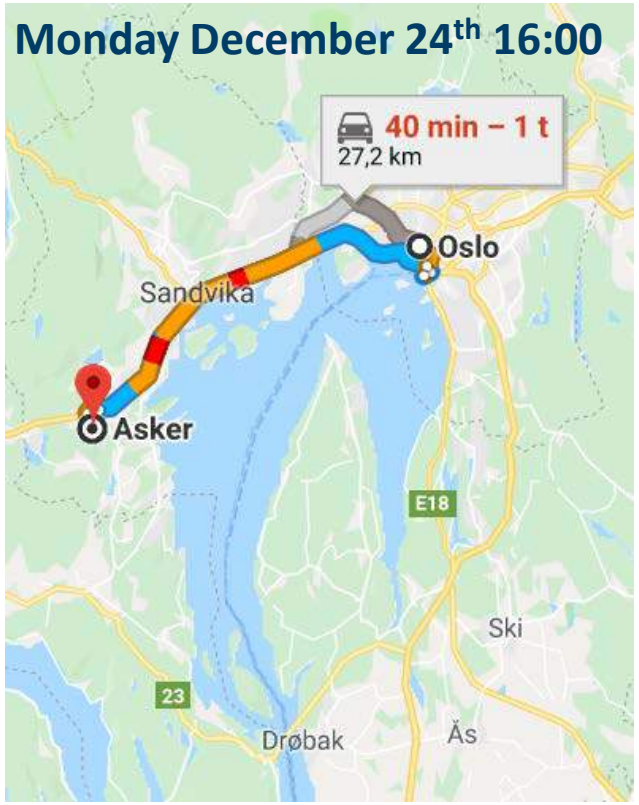
Predicted: Wolf
True: Husky



Source: Ribeiro, Singh, Guestrin, (2016); *"Why Should I Trust You?" Explaining the Predictions of Any Classifier*

Omitting knowledge leads to obvious errors

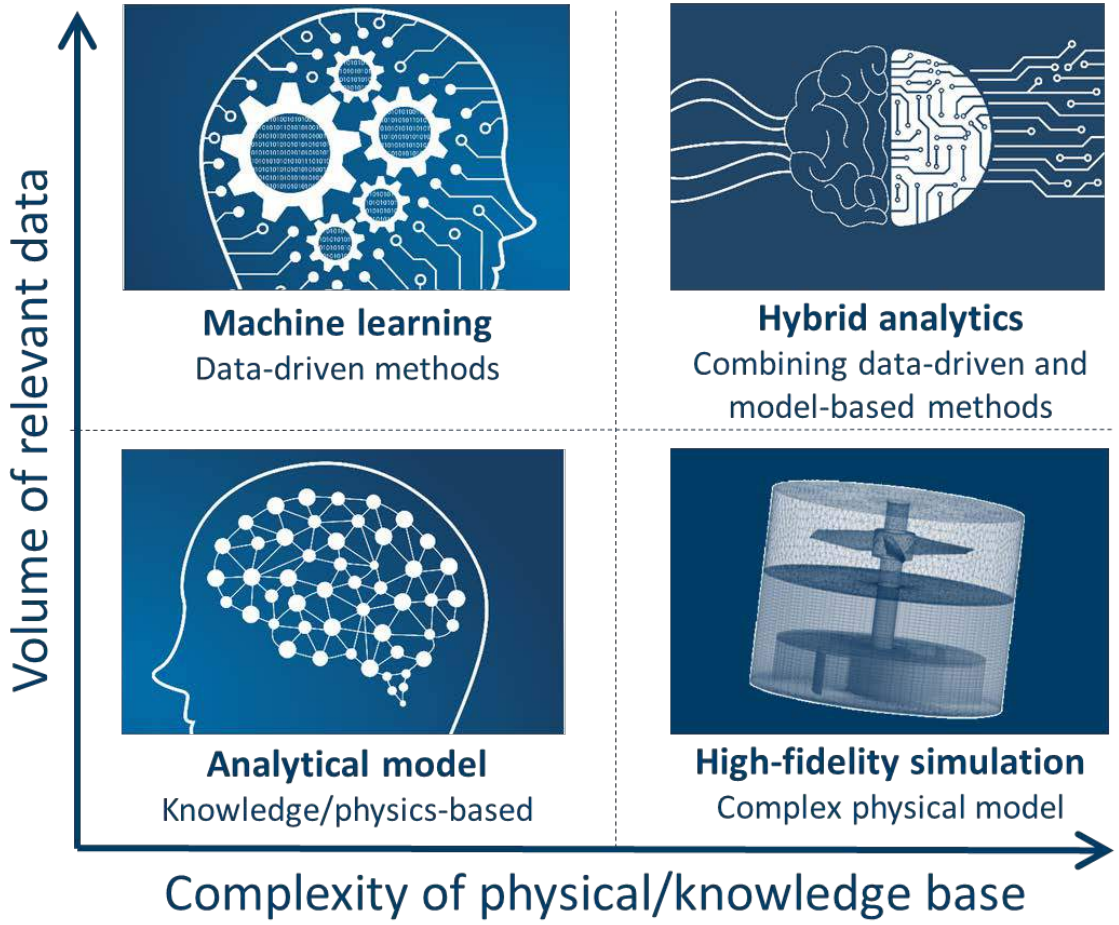




Sources: GoogleMaps

Hybrid analytics

- Developing new methods by combining data-driven and model based methods
- Industrial use cases



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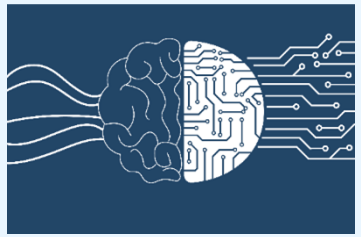
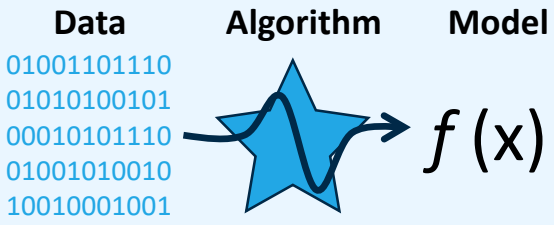
Focus areas within artificial intelligence

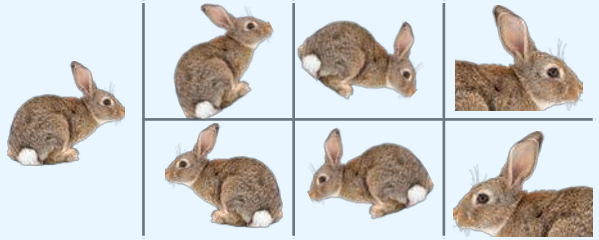
Hybrid analytics



Machine learning

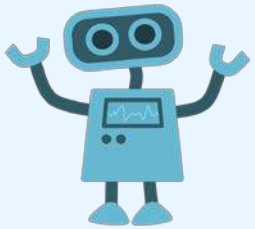


Data synthetization

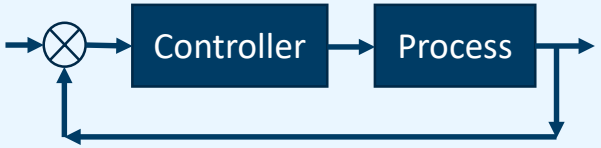


Explainable AI

Reinforcement learning



ML-in-the-loop



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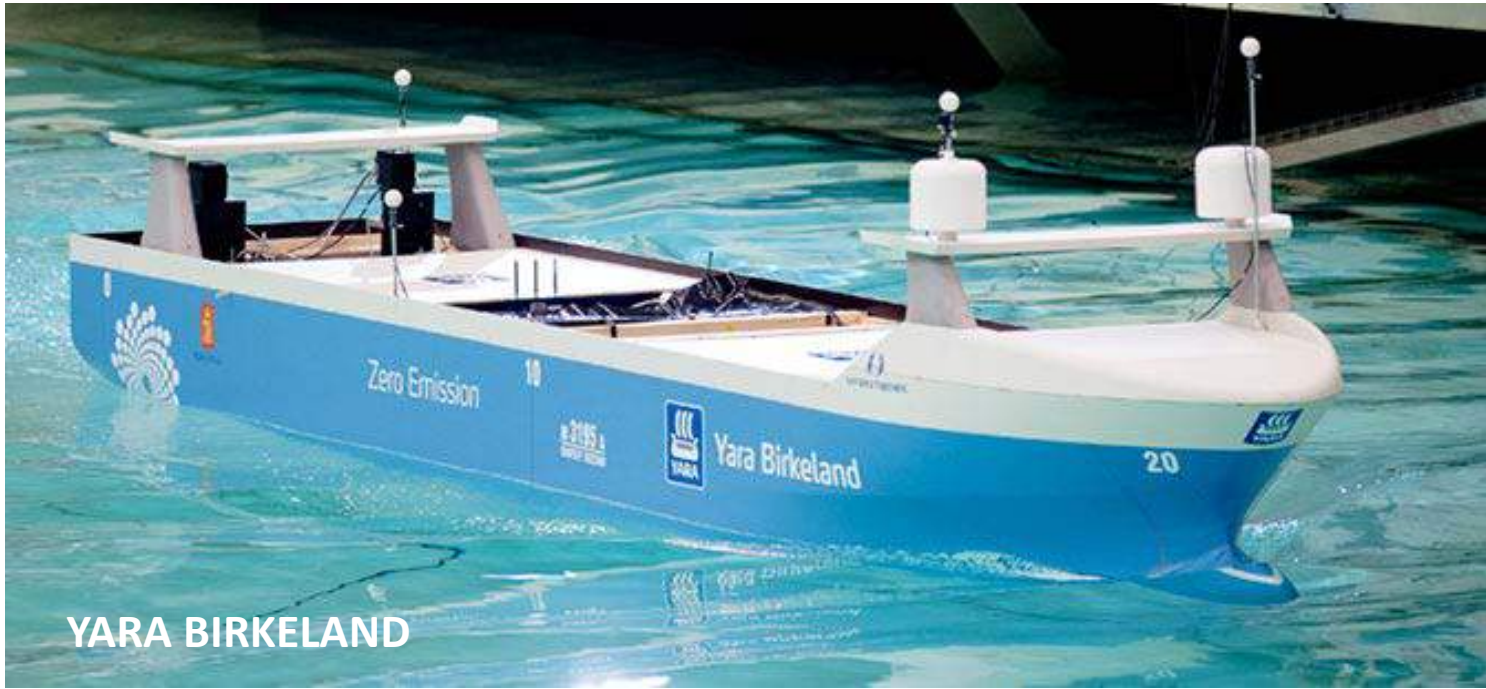
Safe and explainable AI

PELOTON

VOLVO



YARA BIRKELAND

AI as Norwegian growth engine

If artificial intelligence is combined with data sharing in main industries, we can create value from data - as we did with oil.

Photo: Svein Grønvold, Samfoto
Source: Rustad, Hagen, Lech (Nov 2018) Slik kan data bli den nye «oljen», Dagens Næringsliv https://www.dn.no/teknologi/teknologi/stordata/maskinlaring/slik-kan-data-bli-den-nye-oljen/2-1-457867

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Organize and analyse data = "new oil"

- Create, organize and analyse data
- Renew existing industry
- Create new "supplier" industry

KONGSBERG

DNV·GL

Cognite

ARUNDO

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Importance for Norway

- Exploit expertise and know-how
- Strengthen Norwegian competitiveness
- Customize solutions
- Build new businesses

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Technology for a better society