



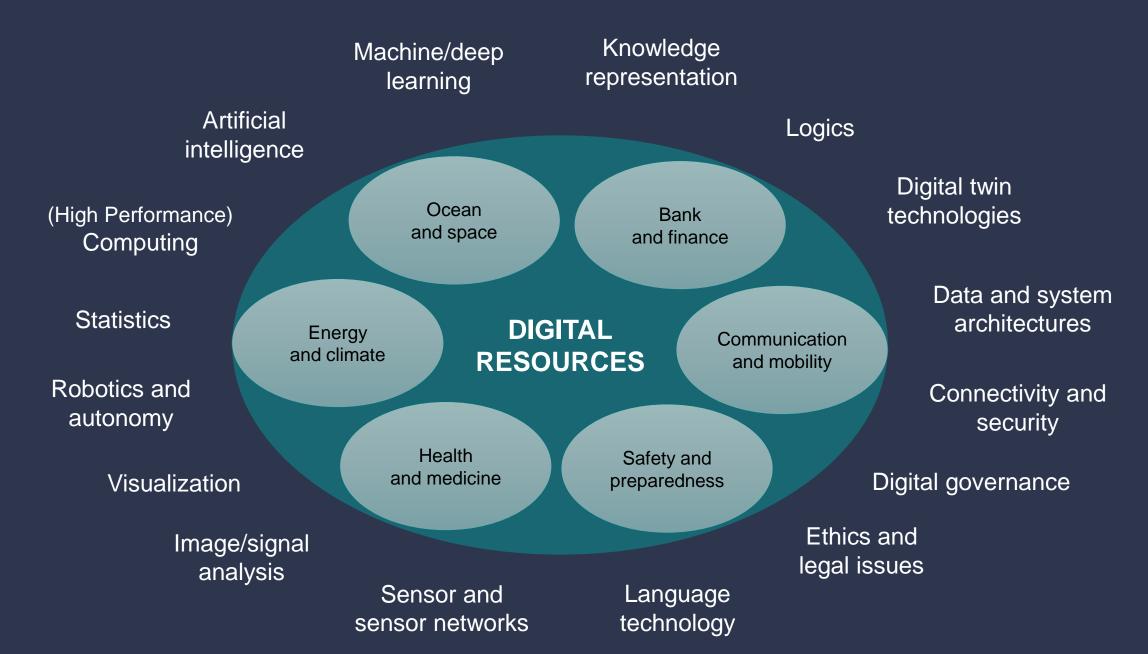
Artificial Intelligence in Twin Transition

Morten Dæhlen dScience, University of Oslo

Nordic Perspectives 2023 12 October 2023



The landscape of dScience!





Research strength

100+ existing research projects

40+ research groups

320 (80) project-affiliated PhD students

36 network events in 2022 (1600 participants)

Access to infrastructure

TSD (sensitive data)

EduCloud (collaboration framework)

HPC clusters (Fox, Sigma2, LUMI)

NRIS (national data storage)

EOSC (European Open Science Cloud)

Enablement of large-scale Initiatives



Integreat – Norwegian Centre for Knowledge-driven Machine Learning (Centre of Research Excellence funded 2023-2033)



DSTrain - Data Science Training (Marie Curie COFUND (EU) project 2024-2028. 36 Postdoctoral fellows)



Norwegian Al Cloud (National infrastructure funded 2023-2027)

Disruptions and disruptive technologies

A disruption is a sudden and significant, often technology-driven, change in society or markets.

Disruptions are difficult to predict and often discovered long after they have occurred.

Will the new Al-solutions (generative methods) create disruptions?

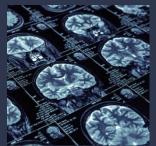
Constantly thinking about it!

Artificial intelligence is the collection of methods, algorithms, and technologies that learn from data and experiences and have the ability to perform physical and cognitive actions perceived as intelligent.







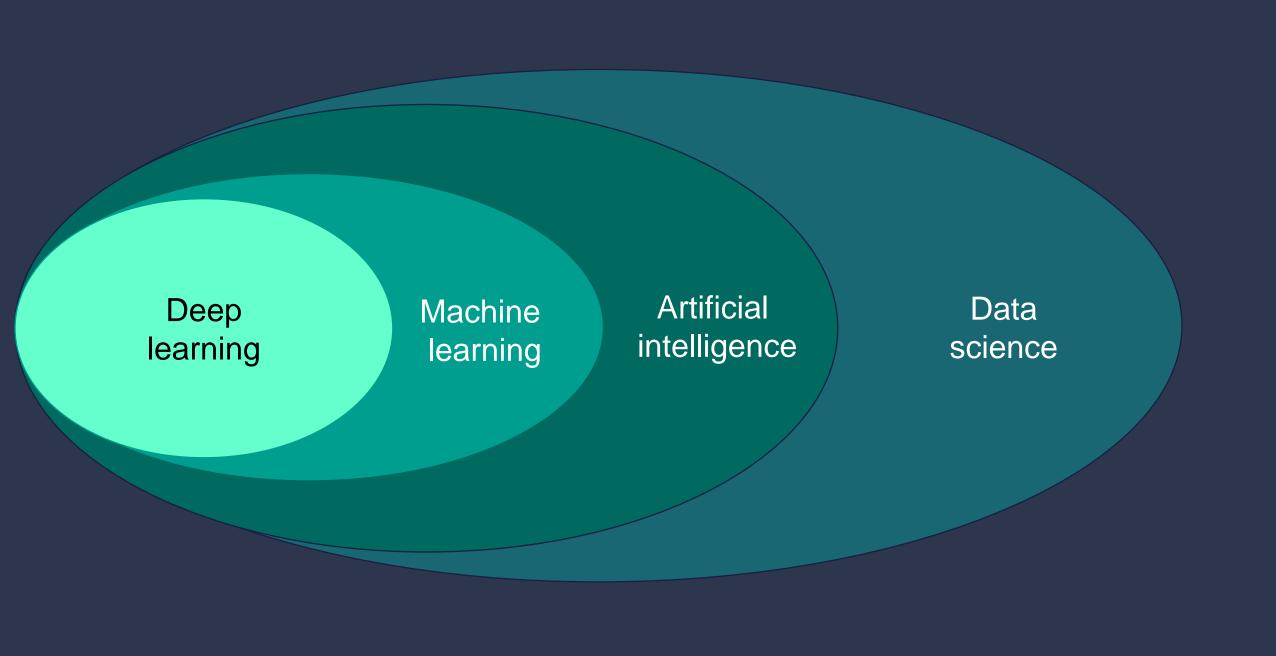






ChatGPT er en type Al-modell som kalles en "generative language model". Den er trent opp på store mengder tekstdata for å kunne forstå naturlig språk og generere naturlige svar på menneskelige sparsmål.

Modelien bestär äv en stor nevral nettversanstiektur med mange lag, som brukes til å uttere oppgaver som tekstgenerering, oversettelse, spersmål-svar, og mer. Modeller ble trent opp på enorme mengder tekst fra internett, inkludert nettsider, baker og artikler, og bruker denne kunnskapen til å forstå sammenhengen mellom ord og setninger og generere passende svar på forespersier.



Al@UiO – at a glance (Science and Applications)

Energy Ocean and Climate and Space Medicine Bank and Healtcare and finance Social Science, AI@UiO Communication **Humanties and Arts** and media (Initiated and/or coordinated by dScience) **Natural and Medical** Safety and Sciences and Technology preparedness Knowledge Ethics, legal issues representation and governance Methods and

algorithms

AI@UiO – at a glance (selected actions and projects)

Large language models

Twin transition in Energy

Resource efficiency in healthcare

dScience
Partner Program

Al events (Data Science Day)

UiO-network of PhD-/post-doc (350)

CompSci & DSTrain
Marie Curie COFUND

Al Act preparetion working group

AI@UiO

(Hosted, coordinated and supported by dScience)

Al Honors program (bachelor and master)

Al networking (hosting NORA)

National/international storage and compute (e.g. LUMI, EOSC)

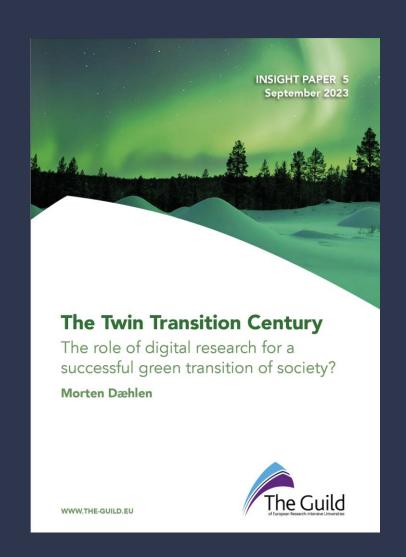
Nowegian Al Cloud (hosting infrastructure)

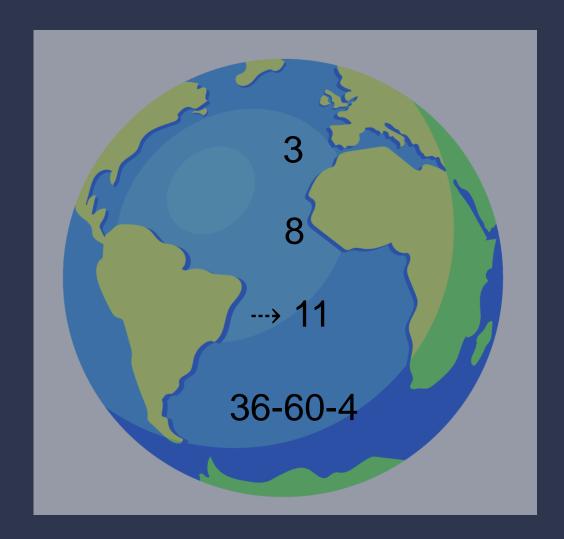
Integreat (CoE 2023-2032)

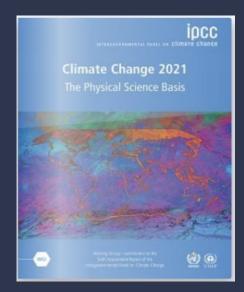
Artificial Intelligence in Twin Transition?

What should be Europe's digital research and innovation agenda to achieve a successful green transition of society?

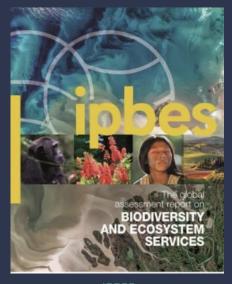
How can we ensure that the «digital part of the world» becomes greener?







IPCC The Intergovernmental Panel on Climate Change



IPBES
The Intergovernmental
Science-Policy Platform
on Biodiversity and
Ecosystem Services

The digital transition

of society consists all processes at all levels in society producing and applying infrastructure, services, applications and human behavior that depend on digital representation of knowledge and computer power.



The green transition

of society is about reducing greenhouse gas emissions, preserving and restoring nature, reversing environmental degradation and ensuring that the energy of the future comes from renewable sources.

The twin transition

is about how the dynamics and strength of the digital transition affects the green transition of society, and how these two transitions mutually influence each other and should be combined in the coming years.

Secure long-term preservation of nature

Maximize the share of renewables into the energy mix

Reduce greenhouse gas emissions

Environmental sustainability

Create new profitable jobs

Optimal production, distribution and consumption of energy from weather-dependent resources?

Create an energy efficent society

Energy equity

Understand risk and increase economic performance in energy systems and markeds?

Energy security

Engage and empower citizens for the energy transition

Cost efficiency in renewable energy projects and operations

Secure energy flow and management in the energy landscape



Twin Transition in ENERGY

Mission Management

Reporting System

Operational Planning





Control Mechanism

Energy Management

Energy flow

Component Handling

A climate-friendly digitised society

Green computing

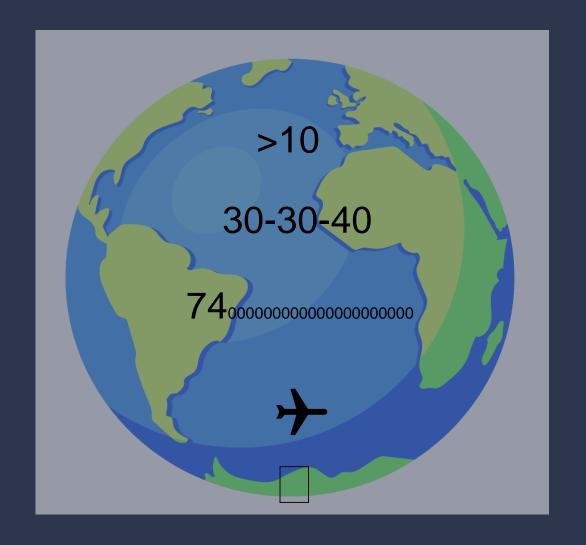
Efficient algorithms

Data sharing

Edge intelligence

Digital waste and recycling

Efficient hardware



Thanks!