

# Trender innen digitalisering i industrien

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Norsk forening for fjellsprengeteknikk  
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# Industriell DataOps for industri verden over

**700+**  
ansatte



Verdens raskest voksende industrielle SAAS-selskap



*Investorerer med dyp  
industriell forståelse og -  
kunnskaper innenfor software-  
kategorien*



*Global Alliance &  
Center of Excellence*



*Global Partner,  
Energy Industry*



*Strategic Partnership,  
Manufacturing Industry*



## Kundedrevet ekspansjon på tvers av kapitalkrevende industrier



# TRE MAKROTRENDER PÅVIRKER INDUSTRIEN - ALLE ER KNYTTET TIL DIGITALISERING

1

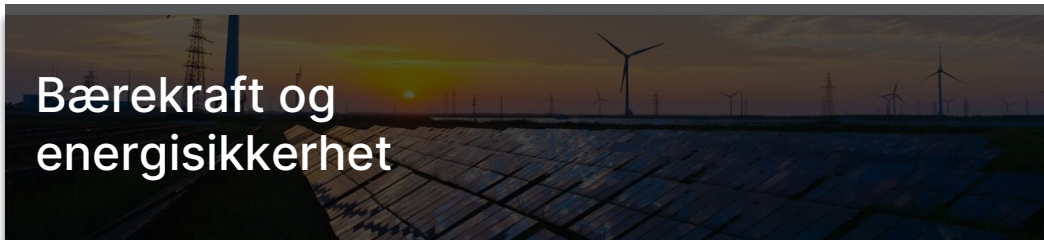
## Industriell Digitalisering



Det er mye utnyttet potensial innenfor frigjøring, kontekstualisering og tilgjengeliggjøring av data

2

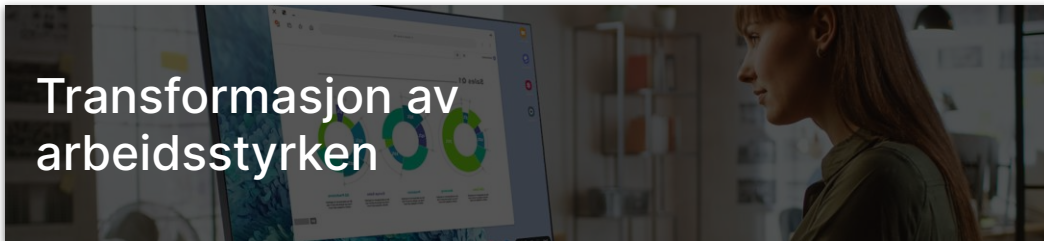
## Bærekraft og energisikkerhet



**Overgangen til fornybare energikilder** øker mengden data og skaper volatilitet og kompleksitet i kraftmarkedet

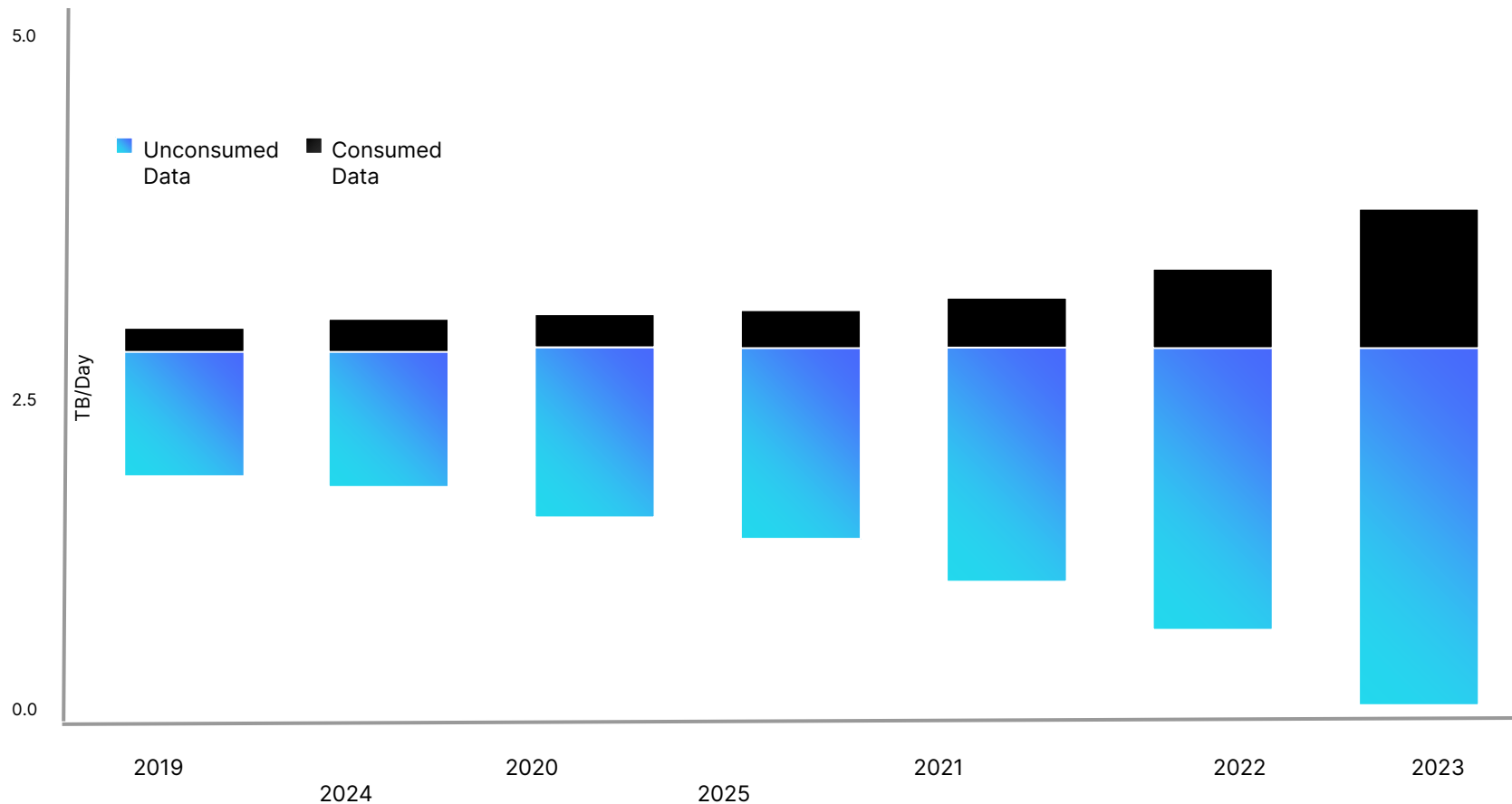
3

## Transformasjon av arbeidsstyrken



COVID 19 har akselerert behovet for å endre arbeidsstyrken til å bli mer datadrevet, jobbe mer virtuelt og bli mer automatisert med flere år

# The Industrial World is Drowning in Data



# Data Contextualization & Analytics is used daily by consumers

The evolution of Google maps...

User accesses a map and **manually** combines it with information from other sources

Google **combines** the map data with the information from the web into a single interface

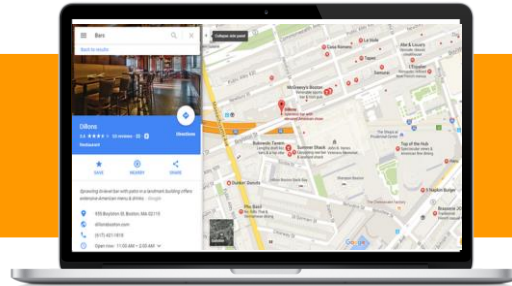
Google interprets the actual meaning behind user queries and **analyzes** the data for insight

Automated contextualization of all the data available to fulfill any user need. 1+ million companies (Uber, Lyft) use it for **rapid** app development



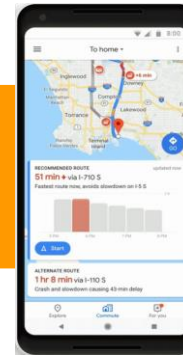
Just Maps

+



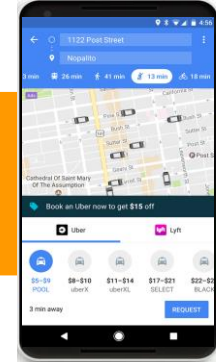
Data from many sources

+



AI/ML

+



Open APIs

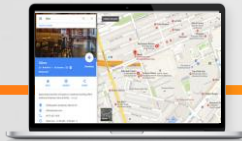


# BRINGING DATA ACCESSIBILITY FROM THE CONSUMER WORLD TO THE INDUSTRY

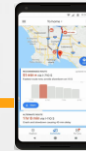
Users access a simple map interface to find the information they need.



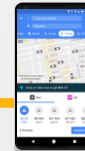
Google combines the map data with information from the web such as traffic information and hours of operation.



Google interpretes the actual meaning behind queries and provides the answers in a unified user interface.



Allows automated orchestration of all the data available to fulfill user needs.



MAPS



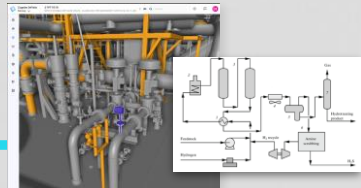
DATA FROM MULTIPLE SOURCES



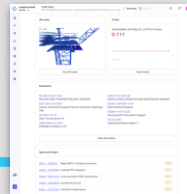
HUMAN SEMANTICS



OPEN APIS



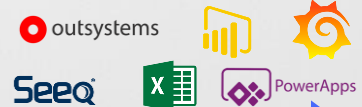
Users can access **Process Flow Diagrams/3D/maps** to find the correct data



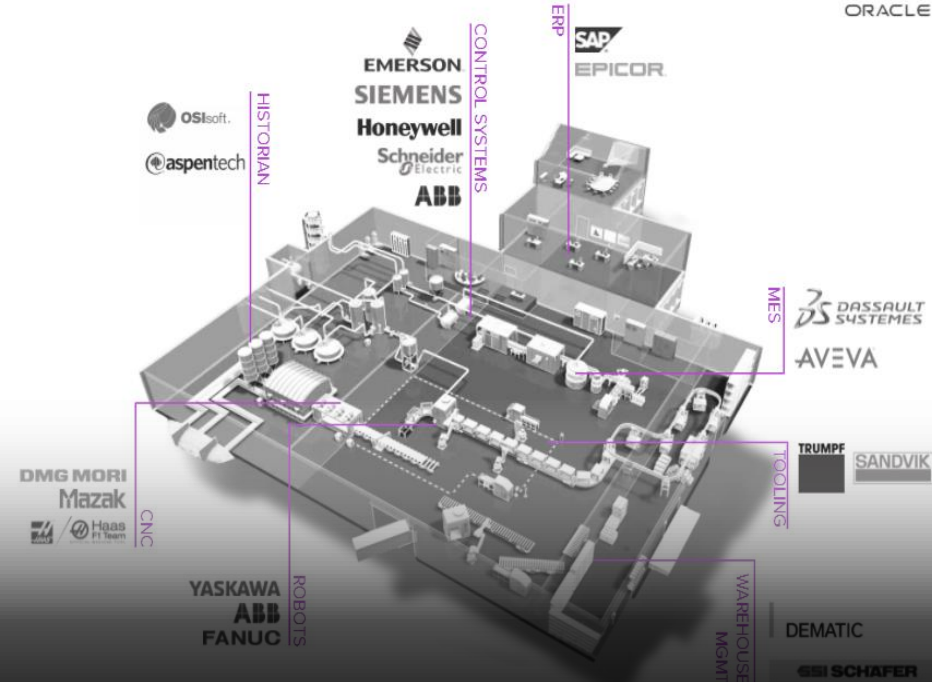
CDF combines the location data with **process data, tech documents, maintenance data, product quality data, images, videos**



CDF interpretes the actual meaning behind **queries** and provides the answers via **API/SDK** or via **UI**



Allows connection from **third party solution**, fully utilizing the existing ecosystem



## INDUSTRIAL REALITY

Finding, accessing and understanding industrial data is time consuming... if not impossible



```
ns extends Proj
or() {throw Err
ing = ""; priva
ean = false; private loginA
_CDF_APP_H
DER, from "/constants"; i
/metadata"; i
export const P
interface OAuthLoginOpt
port function throwRelog
```

## POSSIBILITY

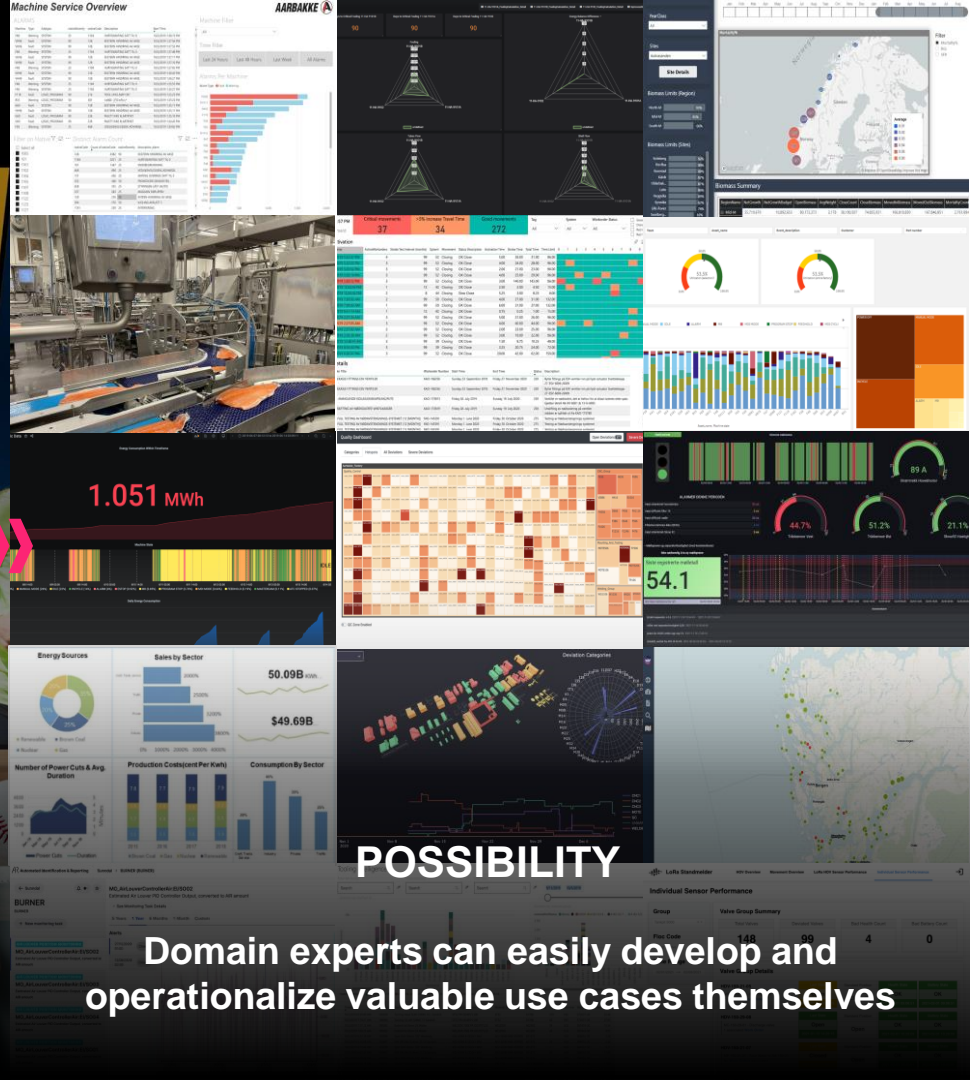
Everyone in the organization have meaningful IT, OT, ET and visual data available at their fingertips





# INDUSTRIAL REALITY

Only highly skilled IT professionals are able to develop and operationalize data-driven solutions



# POSSIBILITY

Domain experts can easily develop and operationalize valuable use cases themselves



## INDUSTRIAL REALITY

Valuable time of highly skilled (process) engineers is wasted on routine inspections and repetitive tasks

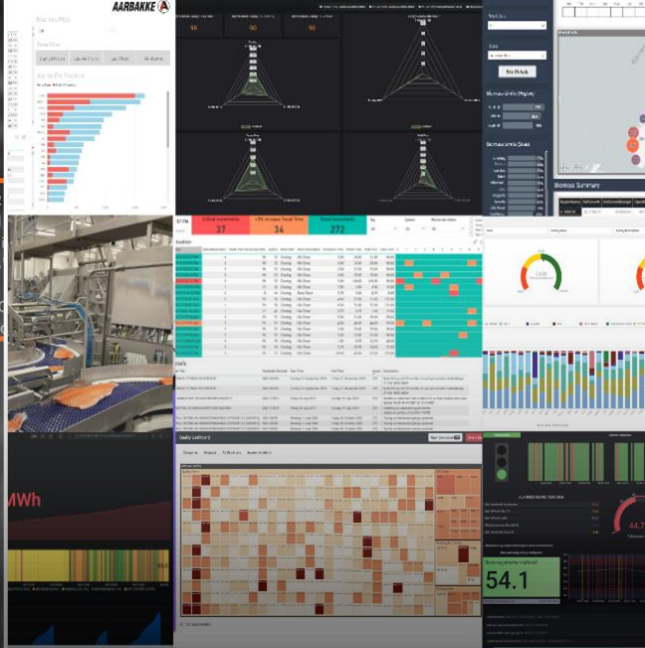


## POSSIBILITY

Automate operations e.g., autonomous robotic inspection and maintenance



```
ns extends Project {
  authenticate() {
    if (this.isAuthenticated()) {
      return this.redirectTo('REDIRECT_URL');
    }
    this.redirectTo('LOGIN_URL');
  }
  login() {
    this.redirectTo('REDIRECT_URL');
  }
  logout() {
    this.redirectTo('REDIRECT_URL');
  }
}
```



**With Industrial DataOps, all of this, and a lot more, is possible TODAY**

**Easy access to all IT, OT, ET and visual data. In context.**

**Empower everyone to rapidly build and scale solutions.**

**Enable advanced analytics and autonomous operations.**

# Digitalisering er nødvendig for å nå ambisjonen om nullutslipp innen 2050



**Dramatisk redusere ledetiden** for utvikling

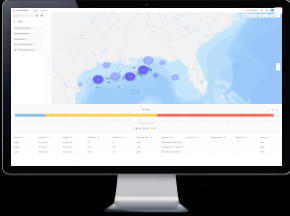


**Forandre markeder og muliggjør nye  
forretningsmodeller**



**Oppnå økt lønnsomhet og lavere CAPEX og  
OPEX**

## ENERGY OPTIMIZATION



## ASSET INTEGRITY MANAGEMENT



## TURNAROUND PLANNING & EXECUTION



## GHG REPORTING / SUSTAINABILITY



## AUTONOMOUS OPERATIONS - ROBOTICS



# IT'S ALL ABOUT DATA RELATIONSHIPS

Automated discovery of relationships in diverse data, transforming data into knowledge



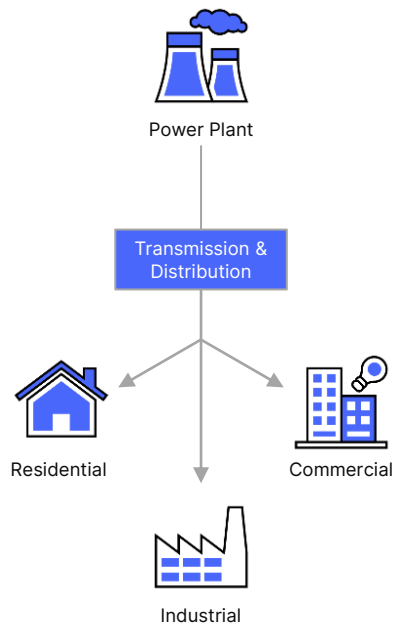
## DATA SOURCES



# Fremvoksende markeder og nye forretningsmodeller

## Før

Tradisjonelt strømnett



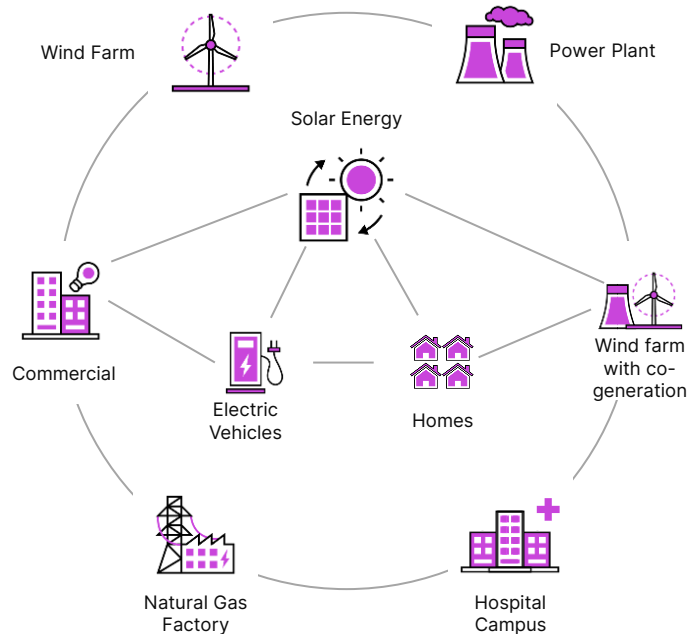
Marketsetterspørsmål

Teknologi Innovasjon

Retningslinjer og regulering

## Fremvoksende

“Energiskyen”



# Reduser ledetiden, Oppnå Økt Lønnsomhet og lavere CAPEX og OPEX

- Standardisering, samarbeid og sømløs datadeling
- Digital tvilling med alle datakilder, fra sensordata til fotogrammetrimodell
- Integritetsstyring og vedlikeholdsplanlegging i 3D, med 360 bilder
- Ytelsesanalyse og sanntidsovervåking med BI-verktøy



# E2E workflows accelerate realization of the full value potential

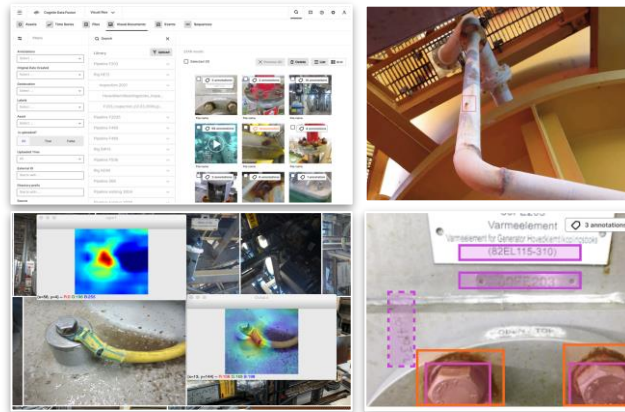
## DATA COLLECTION

Robots together with our software provide an important step towards autonomous asset-intensive industry



## PROCESSING

Contextualization of visual and audio data provides more context



## SHARING INSIGHTS

Close communication loop between the field and the office and enable data-driven operations at scale



## MISSION EXECUTION

## FLEET OPTIMIZATION

## INSPECTION PLANNING



Inbox (705) - stein.danielsen@co x Cognite Drone Dashboard x +

127.0.0.1:5500/public/camera.html

### DRONE DASHBOARD

#### AUTONOMOUS DRONE

Site: Husnes 2022-10-19

Show live video

Show mission

- Drone
- Mission
  - Abort on person
  - Abort on gas
- Gas sensor

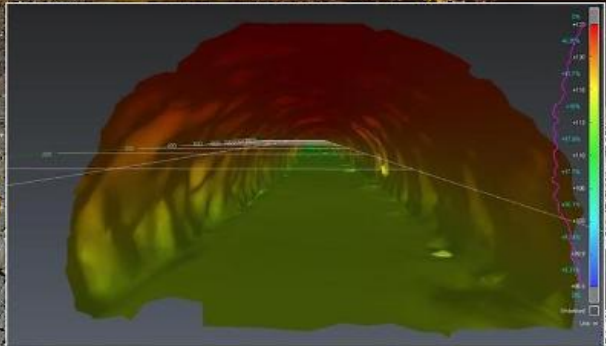
Close Controls

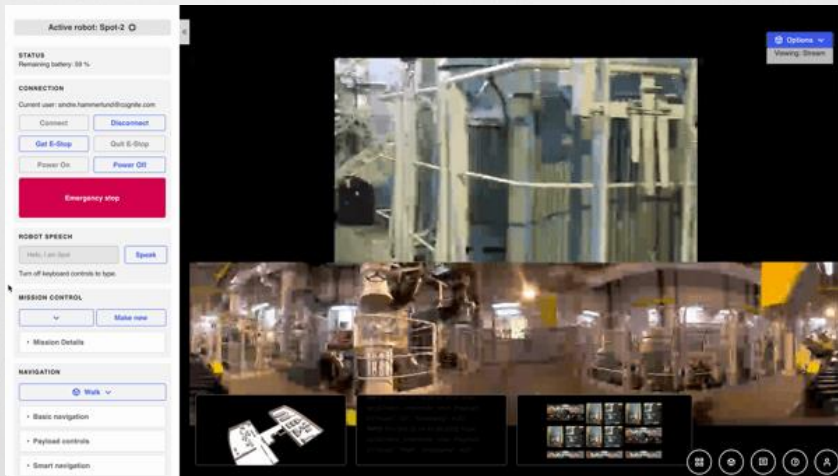
Digital twin powered by **COGNITE**

15x  
Oct 19 2022  
11:14:29 UTC

7°C Skyet

16:11 07.11.2022





# CUTTING COST & IMPROVING HSE BY CONTROLLING OFFSHORE ROBOTS FROM ONSHORE

Enabling workers to solve inspection work orders remotely:

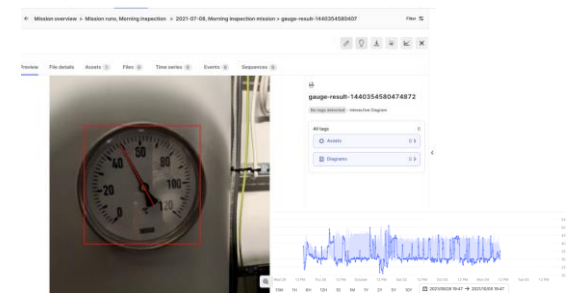
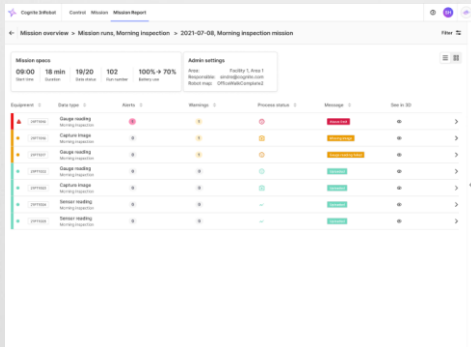
- Minimize CO2 emissions related to travel
- Keeps people out of harmful environments and harsh conditions
- Aids in maturing the industry for robot adoption which with time will boost the environmental effects

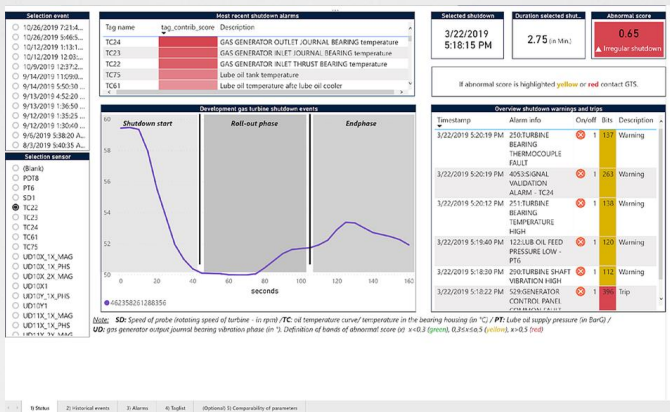


# Autonomous **routine inspection** in Context

Provide efficient autonomous inspection, for predictive maintenance, product optimization and operator rounds. Having searchable robot data and potentially replace night shifts:

- Easy to setup and execute repetitive robotics missions
- Monitor and schedule robot missions and review robot data
- Robot data is linked to equipment and other sources
- Pipelines to handle robotics data for automated data review





# First responder - robot mission based on alarm

By fusing the robotics map with 3D and geospatial information, the robot knows the position of equipment. Thus based on a alarms, rules or notifications, the robot can visit specific equipment:

- Through scalable contextualization robot map can be mapped to X equipments
- With historian and notification integration, the robot missions can be generated automatically





# INCREASING WORKER EFFICIENCY THROUGH ASSET TRACKING AT LARGE YARDS

Using robots, drones and ptz cameras to run autonomous inspection missions daily and position mobile objects at a 2D map based on geographic location and heading of the camera.

Enables operators to:

- Optimize truck paths and storing locations
- Work more efficiently

BostonDynamics





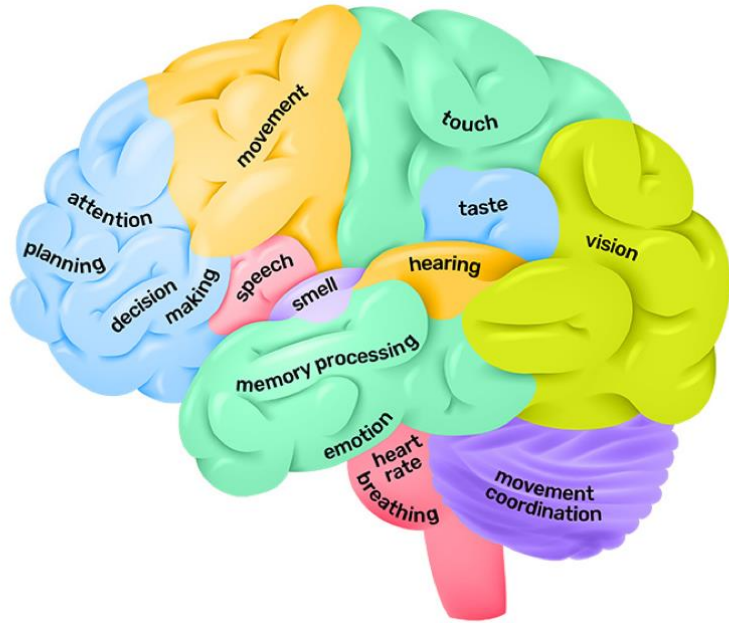








# INTEGRATED AI: HIGH-LEVEL BRAIN AUG/2021



Region	Function	Tech	Progress	Verb
<i>Frontal lobe</i>	Memory processing, reasoning, regulating emotions...	<b>GPT, BlenderBot 2.0...</b>		<b>PROCESS</b>
	Planning, attention, problem solving, decisions, morality, personality...	<b>MuZero, GPT-3, GPT-J...</b>		<b>DECIDE</b>
<i>Parietal lobe</i>	Reading and comprehension...	<b>GPT-3, GPT-J...</b>		<b>READ</b>
	Sense of time/space, taste, touch, link between functions of other lobes...	<b>Tastry, Gastrograph AI...</b>		<b>SENSE</b>
<i>Temporal lobe</i>	Hearing, speech...	<b>General speech AI (Otter, Dragon, Synthesia...)</b>		<b>LISTEN/SPEAK</b>
	Understanding, language, memory, learning...	<b>BlenderBot 2.0, LaMDA...</b>		<b>LEARN</b>
<i>Occipital lobe</i>	Vision and integrating visual information: colour, shape, distance...	<b>CLIP, Wudao 2.0...</b>		<b>SEE</b>
<i>Cerebellum</i>	Movement coordination, balance...	<b>Robotics (Toyota, Boston Dynamics...)</b>		<b>MOVE</b>
<i>Brain stem</i>	Body functions, heart rate, breathing, temperature...	<b>General monitoring</b>		<b>MONITOR</b>

Alan D. Thompson. August 2021. <https://life architect.ai/>

For interest and visualisation only. Simplified view of a complex structure. 'Best guess' progress as of publication date. Green battery icon Indicates significant progress, but is not indicative of 100% completion.

Brain image: Queensland Brain Institute (QBI) - The University of Queensland. Lobes of the brain. <https://qbi.uq.edu.au/brain/brain-anatomy/lobes-brain>

Brain functions: Singh, A. R. (2010). *Brain-mind dyad, human experience, the consciousness tetrad and lattice of mental operations: and further, the need to integrate knowledge from diverse disciplines*. DOI:10.4103/0973-1229.77412

Brain as system: "There are no inherent barriers to our being able to reverse engineer the operating principles of human intelligence and replicate these capabilities in the more powerful computational substrates..."

The human brain is a complex hierarchy of complex systems, but it does not represent a level of complexity beyond what we are already capable of handling." Kurzweil, R. (2005). *The singularity is near: When humans transcend biology*. New York: Viking.

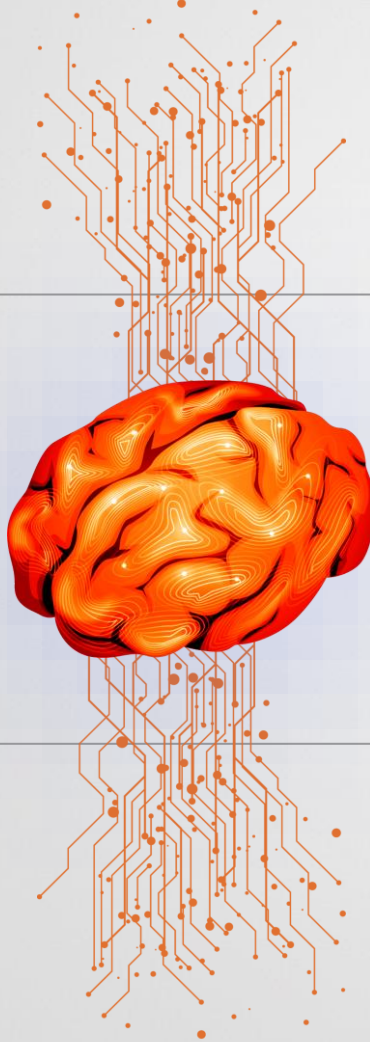
GPT + brain: "Specific models accurately predict human brain activity... with up to 100% predictivity... transformers such as BERT, predict large portions of the data. The model that predicts the human data best across datasets is GPT2-xl [this paper was written before the release of GPT-3/GPT-J], which predicts [test datasets] at close to 100%... These scores are higher in the language network than other parts of the brain." Schrimpf et al. (2020). *Artificial neural networks accurately predict language processing in the brain*. <https://www.biorxiv.org/content/10.1101/2020.06.26.174482v2.full>



## INDUSTRY APPLICATIONS AND USE CASES

## COGNITE DATA FUSION: THE INDUSTRIAL DATAOPS PLATFORM

## DATA SOURCES



### Capture Value

Tools and open APIs to build applications, closed-loop logic and robot control, and create value.

### Accelerate Value Creation

Operationalizing a complex data landscape through data contextualization and use case templization for scale powered by an industrial DataOps platform

### Extract Data

Liberation of data from source systems. Taught by domain experts.



COGNITE

# TUSEN TAKK

