

Intelligent automatiseren van repetitieve bedrijfsprocessen

Joris Van Ostaeyen

Chief strategy officer
robonext

robonext
INVOLVING PEOPLE IN AUTOMATION

AGENTSCHAP
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- Gespecialiseerd in het automatiseren van repetitieve bedrijfsprocessen (finance, HR, IT, aankoop, operations, etc)
- Expert Robotic Process Automation (RPA) en Artificiële Intelligentie (AI)
- Experimentatie met nieuwe businessmodellen (Robots-as-a-Service)
- Opgericht in 2019, 3 co-founders, 15 medewerkers, 30 klanten
- Interesse in deelname aan consortium, research of development. Topics:
 - Automatiseren verwerking van semi-structured documents (bvb PO's, facturen)
 - Ondersteunen van projecten met datacollectie
 - Integratie tussen RPA en AI technieken (Intelligent Automation)

dploy.ai

Bart Smeets

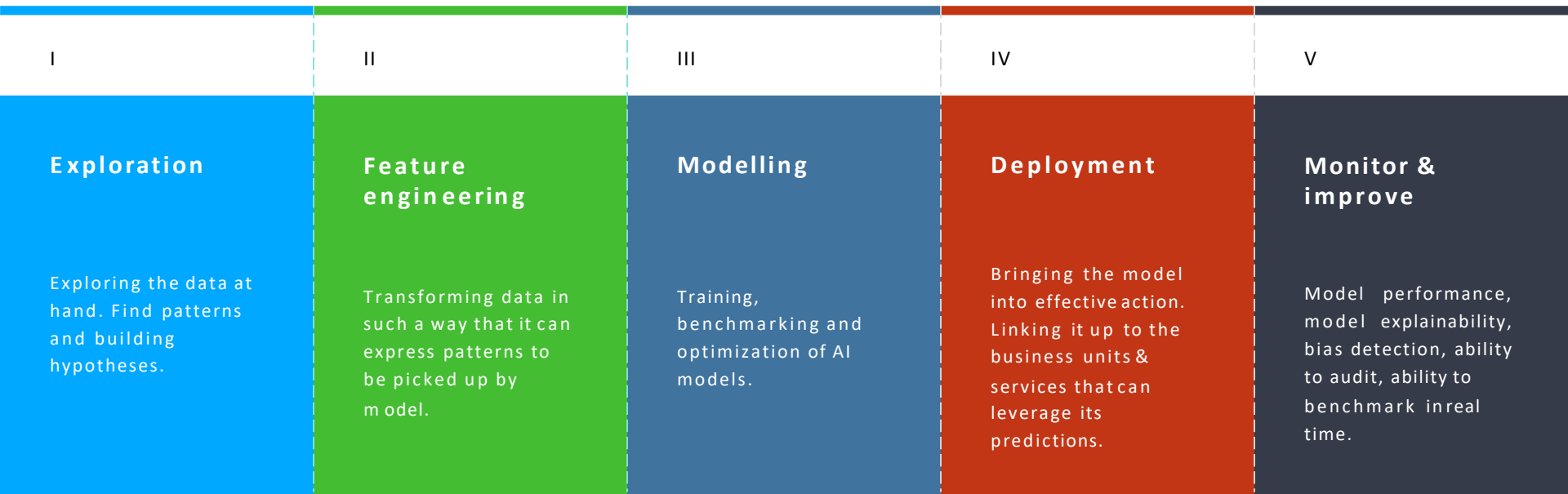
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dplo.y.ai

MLOps-as-a-service



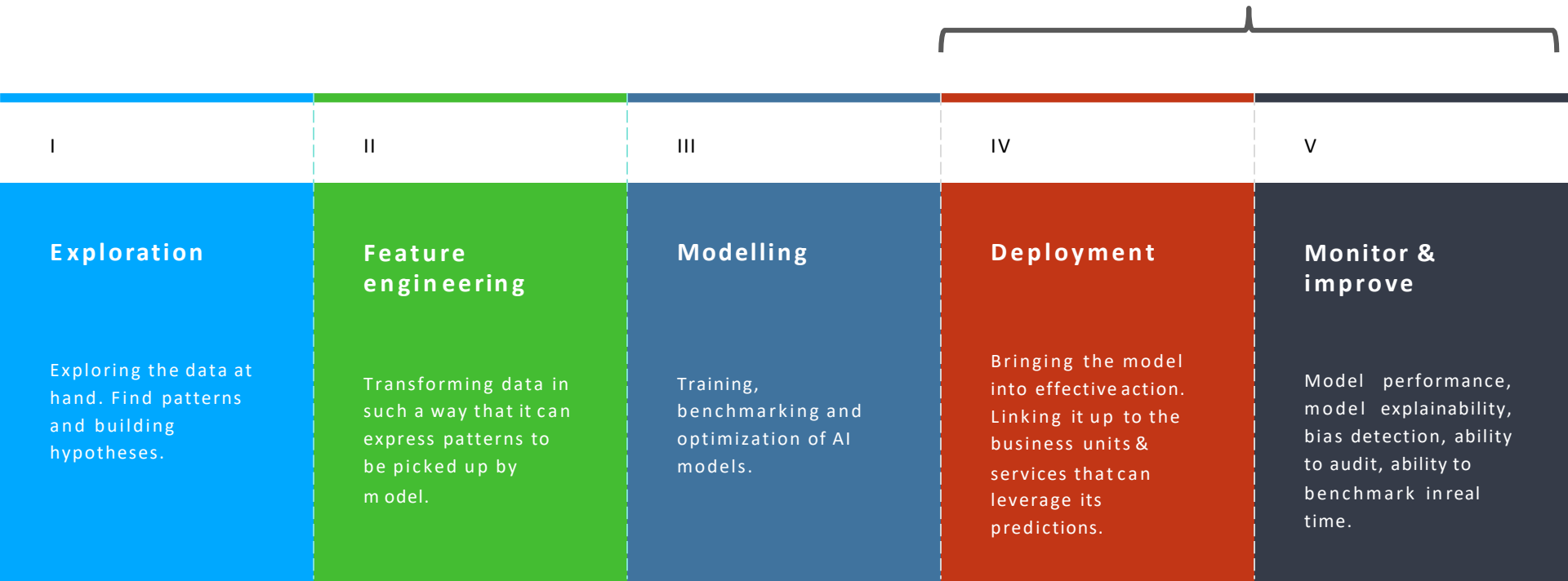
AI lifecycle



AI lifecycle

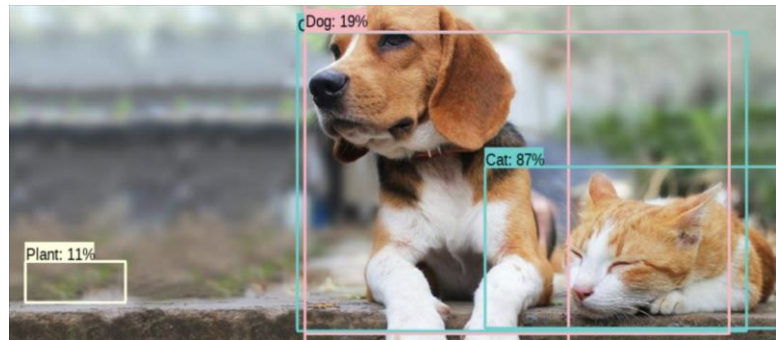
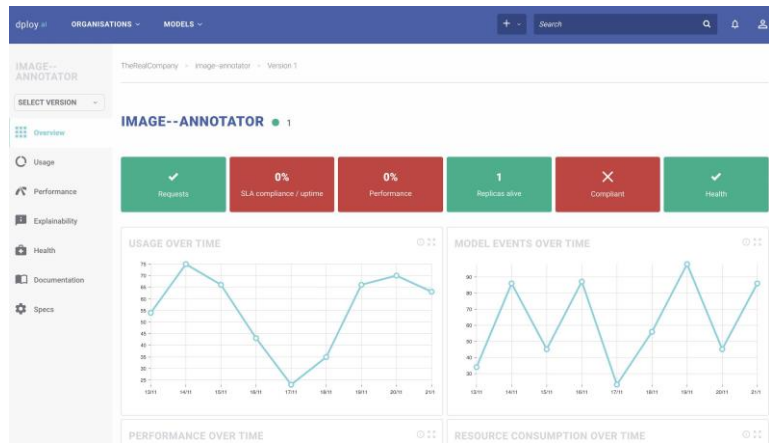
dplo.y.ai

focuses on an essential
but currently
immature part of
the AI lifecycle



Start-up team & MVP

- Pre-revenue
- 2.5 FTE backend engineers
- 1.5 FTE frontend engineers
- Inbound focused step-wise launch
 - Beta release: April/May
 - Public release: September
- Experienced board of advisors



The Ultimate health APP

Toon Poppe
CEO
m AI doc

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m AI doc

Your ultimate health APP



*A unique APP for the permanent
monitoring of your personal health
situation with alarming, diagnosis and
potential medical and medicinal solutions*

All these functions on your smart phone

*The ultimate health App: your life saving
companion*

*Through our App « m **AI** doc », your smartphone
will permanently monitor your proper Electronic
Health Record*

*Safely stored in our private blockchain mega data
platform*

Huge world market potential

1.-Our targeted market is every person on our planet, concerned about guarding his/her most important asset , namely your HEALTH

2.- Healthcare is one of the markets with the largest growth potential

3.- So on our globe every human being is our potential client as soon as he/she owns a smart phone = 4 billion people ?

4.- the best tool for getting a regional/global epidemic under control

Our App « mAI doc will be available free of charge, no purchase

But we will make money from

- 1.-Paid –for publicity about all kinds of health advisory services concerning healthy foods, physical training, intelligent use of medicines***
- 2.-Use of our anonymized health data for medical and medicinal research studies & joint development projects.... towards patent 2***
- 3.-Organizing congresses and TV programs on essential but not yet solved health problems of mankind***

All competitors in online health monitoring

- ***only do that for one health aspect like heart, diabetes, overweight***
- ***eventual alarms are generated without explanation or advice***

But our mAI doc App will, based on all incoming personal health data

- 1. maximally monitor all health/disease aspects of the patient***
- 2. in a continuously operational way, without personal interference***
- 3. with concrete diagnosis and medical and medicinal solutions***

our mAI doc team

- founder: Toon POPPE Drs Economics, 4 universities,
technology prices (Flanders Technolgy International)....*
- partners: - Johan Loecks, VUB prof AI – App development
- Vincent Rijckaert, Dr Civil Engineering IMEC-patents*
- advisors: - Dr Eng AI Jonathan Berte, ceo Robovision
- Dr Eng Peter Hinssen, AI visionary
- Dr jur. Joost Muylle-at patent lawyers De Clercq & partners*
- development: potential partners in Estonia, Singapore, India, USA, UK,
France, Belgium, Portugal*



- best achievements and your financial traction

-Awards: - fellowships at 4 universities: Leuven, U f l, Saarbrucken, Belgrade

**- First price at Flanders Technology International:
factories
in 19 countries**

-Partnerships: - Foresight PHS European project with Prof Ian Miles,

Manchester Institute of Innovation Research

**- Heart Link Online: preventive heart monitoring
solution developed with Corscience – Erlangen-DBR**

**-Revenue: important financial partners yet and contacts with
Google, Amazon... after their reading of my patent**

NEXT

***1.- Patent unique according to Patent Office Den Haag
and business plan under negotiation for initial
evaluation with initial target to raise 1 mio € and to spend 1/3
on***

- software development and testing***
- market prospection, analysis , payment and result follow up***
- setting up income streams with health partners***
- rest for financing central direction and coordination team***

***2.- Negotions with AI development cies in Europe(Belgium,
Estonia,France, Holland, Ireland, Singapore, Canada etc)***

Thank you!

I thank you most cordially for your kind attention

Any intelligent question, constructive suggestion and cooperation proposal is most welcome.

I sincerely hope that all of you will all become our first client partnersbecause your health is your most important asset

Our contact details are:

- Mobile phone in Belgium: 0475 74 86 16**
- E-mail address: toon.poppe@gmail.com**
- website: [www. m Al doc .com](http://www.mAl.doc.com) (under construction)**

Prognostics and health monitoring for electronic systems

Mathias Verbeke,
Data and AI Competence Lab of Sirris

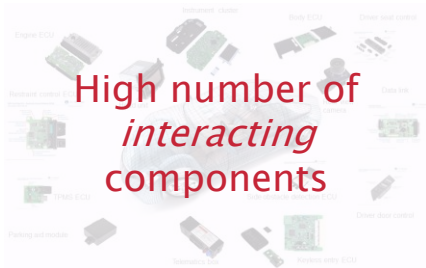


Prognostics and health monitoring for electronic systems

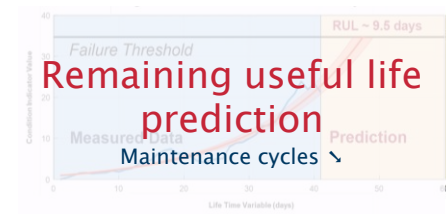
Mathias Verbeke

VLAIO Matchmaking event AI/CS | Mechelen

Designing reliable electronic systems is increasingly challenging...



Prognostics and health monitoring for electronic systems offers new opportunities



RQ1: Sensors

- Mission profile
- Canary

RQ2: Hybrid modeling

- Data-efficient learning
- Physical + data-driven

RQ3: Root cause analysis

- Data collection via run-to-failure tests
- Data-driven root cause analysis models

**We Develop Next Generation
Decision Technology with High
Accuracy and Privacy**



Hasan SUZEN
Founder & CEO
Hybrid Core

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We Develop Next Generation Decision Technology with High Accuracy and Privacy

Solutions: Explainable Hybrid Intelligence (HI)

Problem & Gap

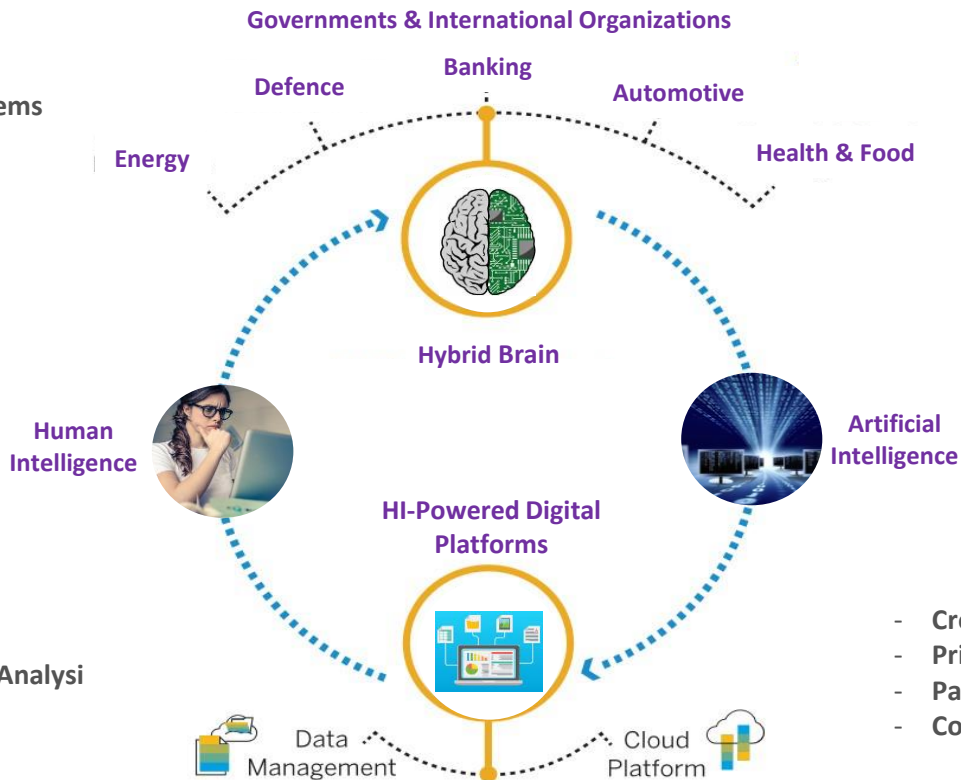
- Trusted Algorithmic Decision Systems
- Applied Intelligent Systems

Team

- 8 Advisory Board Members
- 12 Experts (8 PhD & 4 MSc)
- Research Partners

Our Focus Areas

- Actionable Business Intelligence
- Bespoke Intelligent Threat & Risk Analysis
- Targeted Marketing & Sales



Smart Navigator → ✓ DEMO
MVP – 12M

Funding Gap
1M + Subsidy (245K)

Uniqueness

- Cross-Functional Human-Machine Team
- Privacy-Preserving Federated Algorithms
- Patterns & Interconnectivity Recognition
- Cognitive Architecture Mapping

A3I: Autism Augmented A I

Geert Pauwels

Autimatic

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Vlaanderen
is ondernemen

A3I: Autism Augmented Artificial Intelligence

- **A3I: Autimatic als ideale complementaire project partner & subcontractor**
- Autisme => suprematie in data annotatie, data cleaning en model training
- Geert P.: CTO Niko, CEO Euromold, Antenor, Autimatic

Ir mechatronica / MBA/ AI van MIT

- Jan V.: Lead engineer Siemens / Mind / Newtec, Linux en edge specialist

Ir ICT, AI Stanford, Univ Washington comp. neuroscience

- Ervaring in AI vooral in visual AI, QA, proces optimalisatie
- Interesse: medical, health care, clean energy, QA, duurzame “auti” jobs
- Onaangeboord talent! Speciaal trainingsprogramma, **SOCIAL IMPACT!**



FederatedLearning@the_edge

Chris Minnoy
Oprichter
Energy

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FederatedLearning@the_edge

Chris Minnoy

CENERGY

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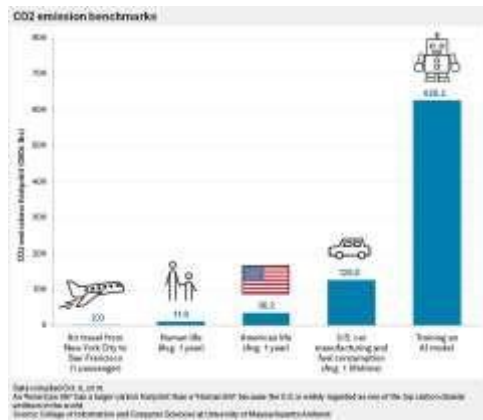
Vlaanderen
is ondernemen

 CENERGY •
INTELLIGENCE AT THE EDGE

Carbon footprint

- Het trainen van neurale netwerken heeft een hoge CO2 voetafdruk
- Voorbeeld: 1 keer training van een NLP (natural-language processing, transformer) netwerk op Amazon AWS \approx 284 ton CO2
- Een computer is in essentie een elektrische weerstand
- Oplossingen: 0-koeling, green power, warmte recuperatie
- Maar ook Federated Learning (Google, 2017)

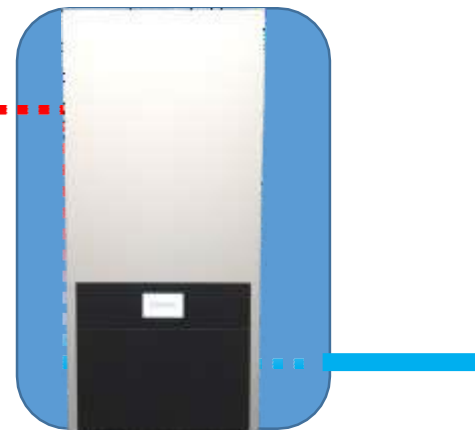
“Federated Learning is a distributed machine learning approach which enables model training on a large corpus of decentralized data.”



Decentraal rekenen/trainen bij particulieren met warmterecuperatie



WW EU: 600TWh/y



0-koeling
warmterecuperatie

- Een dieper inzicht verwerven in het potentieel van dergelijke oplossing in combinatie met Federated Learning:
 - Pros/cons
 - Praktische haalbaarheid?
 - Welke toepassingen zijn er mogelijk?
 - Hoe verhoudt dit zich tegenover het trainen in een datacenter?
- Pilot case:
 - Compute/training nodes plaatsen bij particulieren
 - Met hergebruik van de warmte voor sanitaire doeleinden
 - Een demonstratie van gedistribueerd computing/AI training platform
 - Rekening houdend met de beschikbaarheid van lokale hernieuwbare energie

Partners

- 2 of 3 partners
- Academisch
 - Federated Learning; decentrale computing
 - Carbon footprint assessment
- Bedrijfsleven
 - Sector software ontwikkeling
 - Distributed computing of storage
 - AI; DeepLearning; Federated Learning
 - IoT; Blockchain; Cloud
 - Sector elektronica, telecom of sanitaire wereld
 - Compute/training units
 - Smart Home

Artificial intelligence as a board member and the impact on governance

Henri Jacobs, Managing director Forcit benelux one of the founding members of the Fedges consortium

International non-profit alliance
dedicated to foresightful & edging
research of corporate governance

BECOME A PARTNER →

First paper published in '18

Launch consortium in '20

Topics:

- Climate governance
- **AI on the board (VLAIO)**
- Board as a service
- DAO's (Blockchain driven)
- ... more

Lisa: A.I.-Driven Compassionate Coaching-Chatbot

Jean-Luc Mommaerts

MD, MAI, PhD

Aurelis

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Lisa

A.I. driven
Compassionate
coaching-chatbot

- the tech
- the healing
- the science
- the future

The Journey Towards Compassionate A.I.



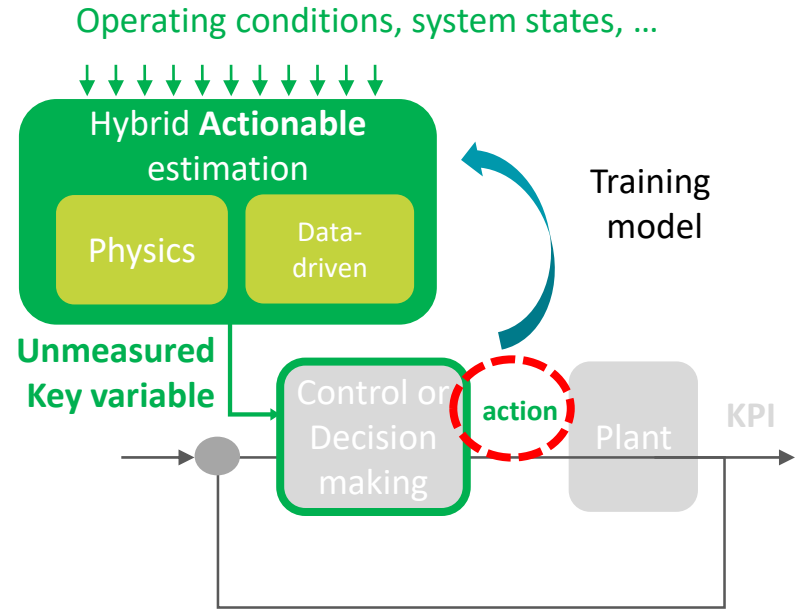
Hybrid Actionable Estimation ICON

Wouter De Nijs
Manager Core Lab DecisionS
Flanders Make

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Hybrid Actionable Estimation ICON

- **Industrial partners:** Manufacturing companies that develop controllers for machines that are heavily influenced by operating conditions or system states which are not directly measured
- **Approach:** Research into a hybrid combination of physical-based and data-driven methods that estimate these unmeasured variables and are trained based on the controller actions
- **Benefits:**
 - Can cope with limited training data
 - Extrapolation to other conditions / machine variants
 - Interpretability of predictions and actions is high
 - Insertion of physical knowledge
 - Deployment on constrained edge hardware
 - After deployment, only uses existing sensors



Ethiek in AI ICONs

Rob Heyman

Coördinator

Kenniscentrum Data en Maatschappij

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Kenniscentrum Data & Maatschappij

"Ethiek is gezond verstand, mensen hebben dit dus iedereen kan ethisch handelen." E. Kant

Is mijn
AI project
ethisch?

kaarten met
vragen en voorbeelden
om te identificeren

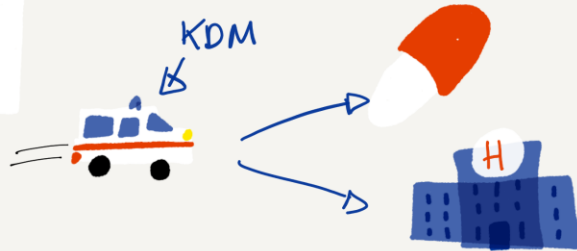
Ok, maar waar begin je
en met wat?

☒ Wacht niet tot je een model
hebt (explainability val)

☒ begin bij het begin

 EHBO

IS EEN PLEISTER
GENOEG OF GA IK
NAAR SPOED?



HW-algorithm co-optimization for edge AI processing

Marian Verhelst

professor @ KU Leuven and
scientific director @ imec

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The **next** circuits for a better life

HW-algorithm co-optimization for edge AI processing KU Leuven & imec

Marian Verhelst
Marian.Verhelst@kuleuven.be

Resource efficient machine learning

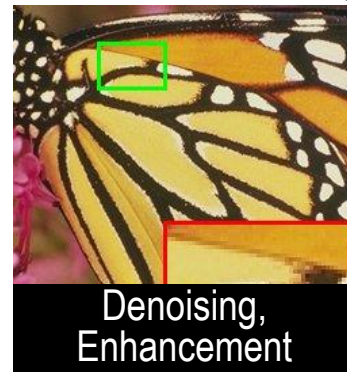
Recognition



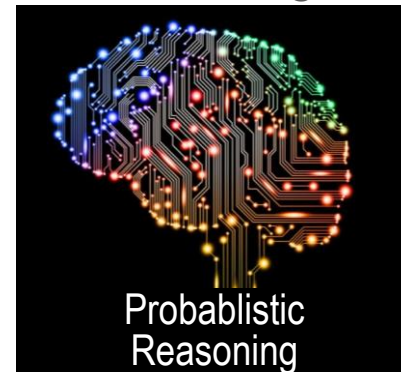
Localization



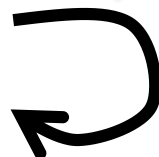
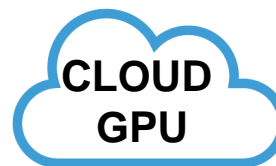
Pixel Processing



Reasoning



tinyML!



Local Processing

Affiliations

KU LEUVEN



Departement Electrical Engineering



**KU LEUVEN
micas**

MICAS

7 professors, 75 PhD

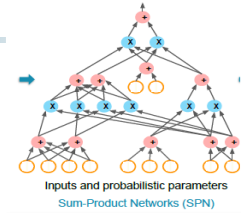
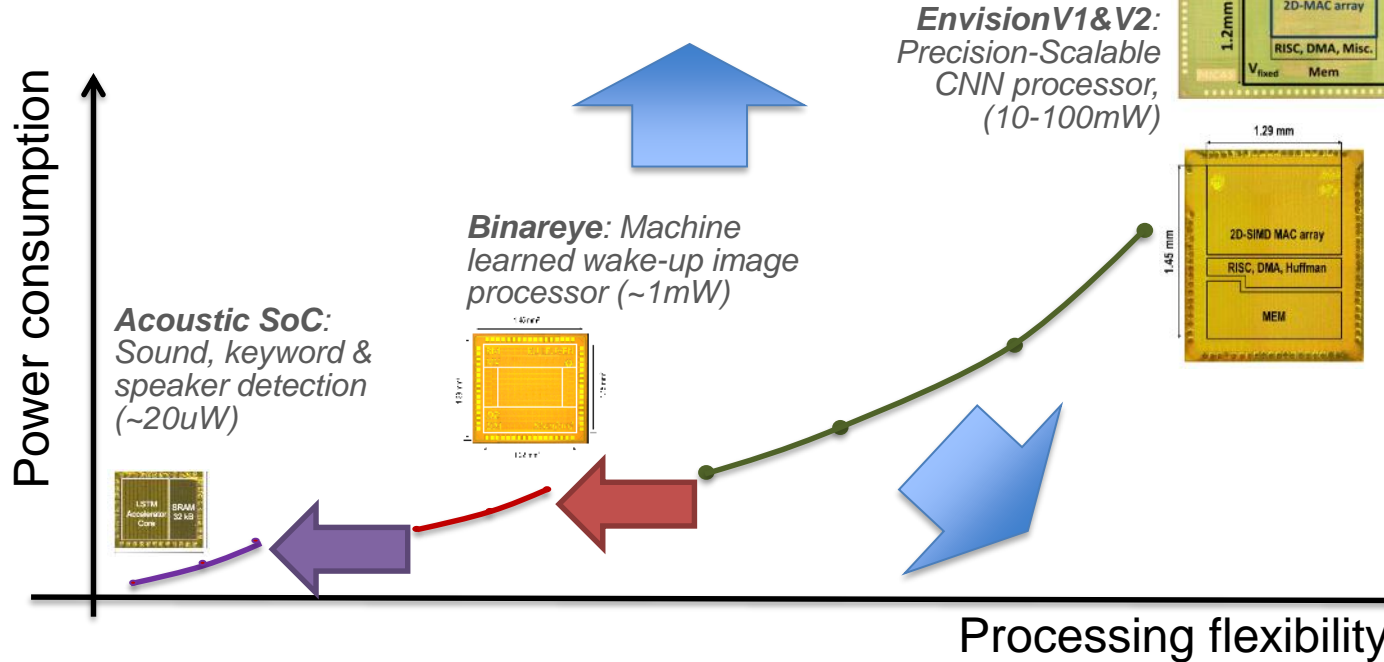
imec

***Digital** processor architectures
HW-algorithm co-optimization*

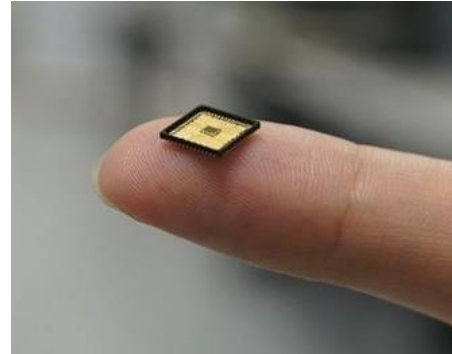
***Mixed-signal** processor architectures
Emerging **technologies***

Several generations machine learning accelerators @ MICAS

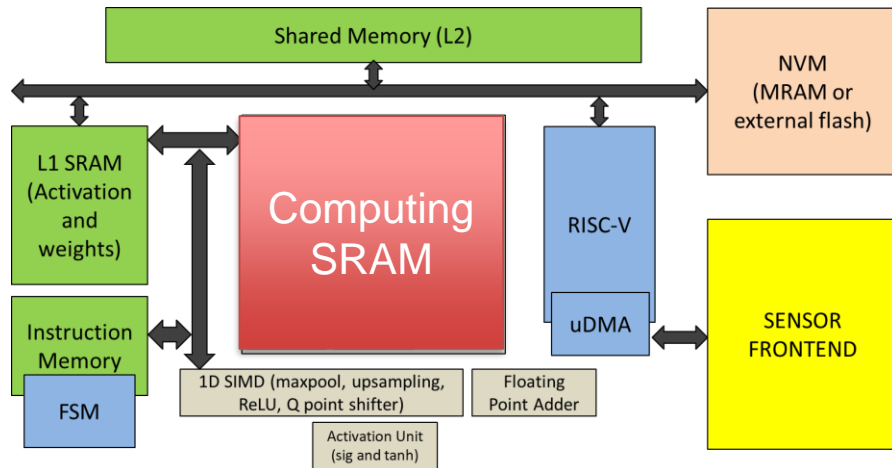
Neural network co-processor chips



Probabilistic model
co-processor



Current hardware focus



1. Towards ultra-low power & scalable

- RISC-V with **digital** co-processor

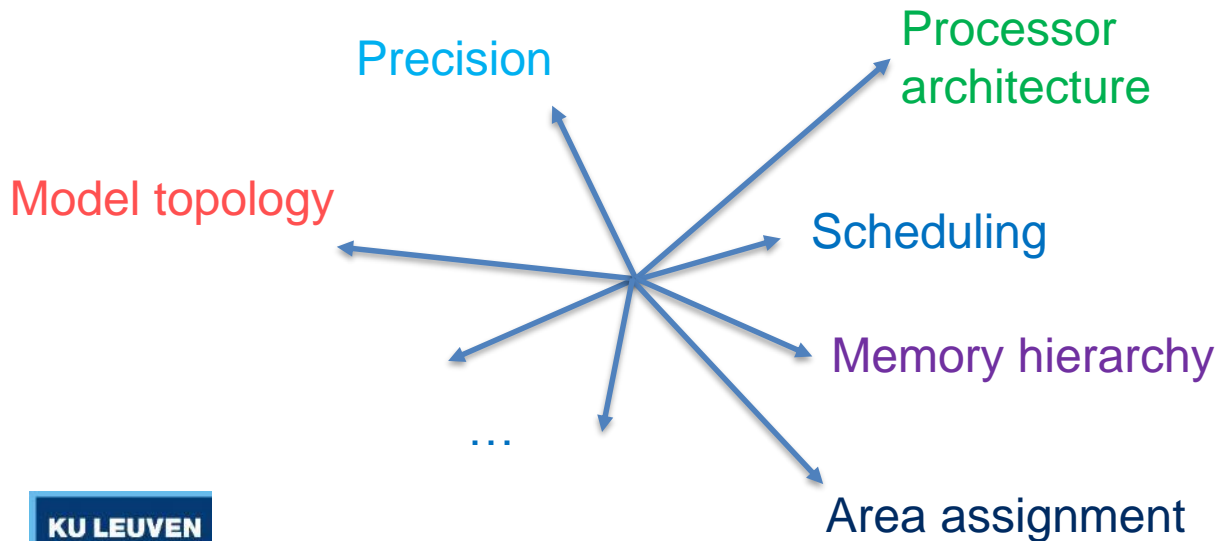
2. Towards high throughput & energy efficiency

- RISC-V with **in-memory** co-processor
- SRAM, later emerging memories

HW-algorithm design space exploration

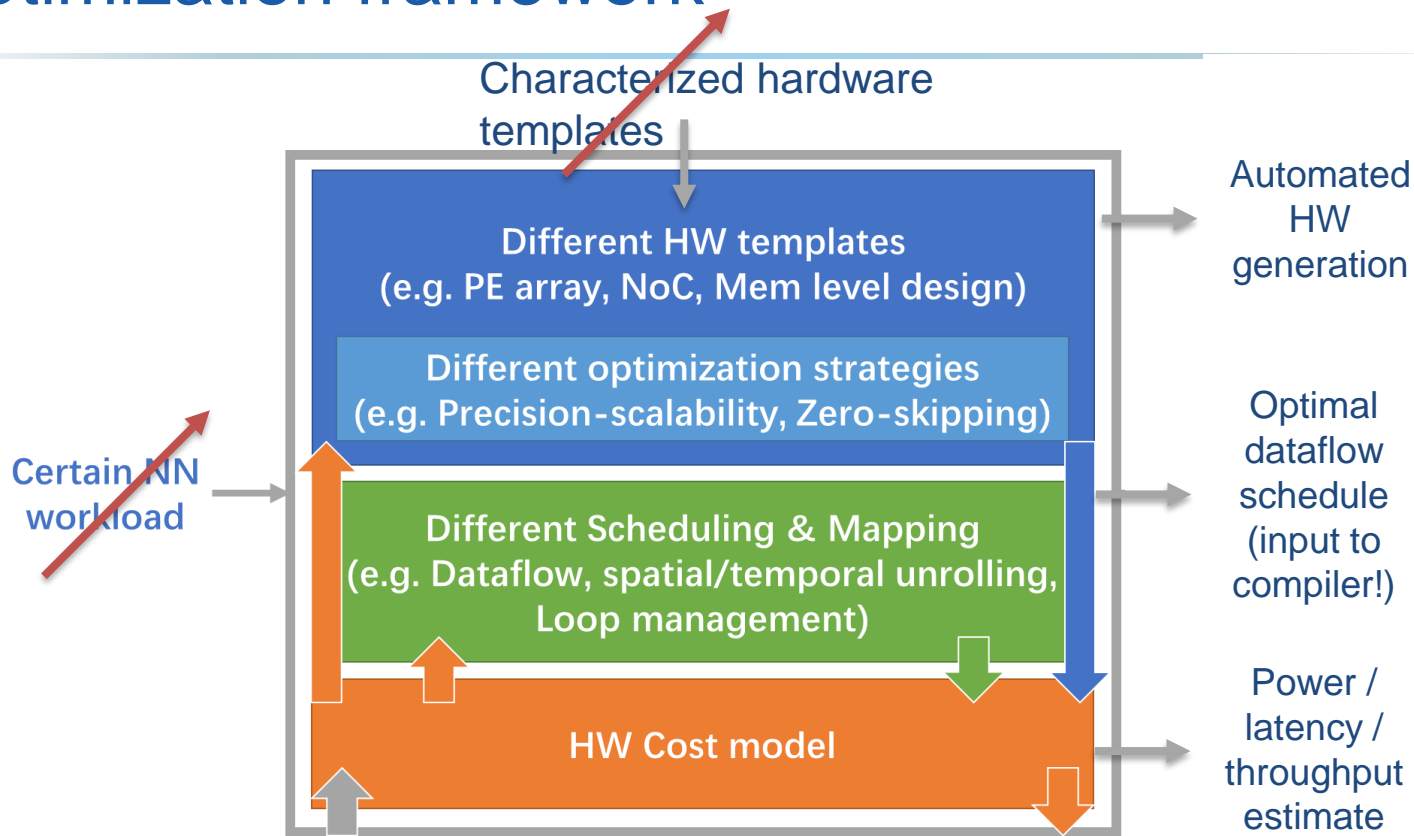
⚙️ Why do **Fast** ML Design Space Exploration?

- Space (SW/HW) is HUGE!
- HW implementation is costly (time/money)!



Most dimensions are interdependent!

Optimization framework



Contact:
Marian.Verhelst@kuleuven.be



KU LEUVEN

imec



Introduction to the VUB Artificial Intelligence Lab

Leander Schietgat
VUB

AGENTSCHAP
INNOVEREN & ONDERNEMEN

Artificial Intelligence Lab

Leander Schietgat
(business developer)

leander.schietgat@vub.be

VLAIO AI ICON Matchmaking event
March 9th, 2020



ai.vub.ac.be



[@aibrussels](https://twitter.com/aibrussels)



VUB Artificial Intelligence Lab

Strong heritage, leading position



Founded in 1983
by Prof. Luc Steels

First AI lab on the
European mainland

36 years of
experience



50 researchers
from 22
countries
13 professors



950
publications
28 000 citations



Current projects
4 EU projects
20+ national projects
10 industry funded projects



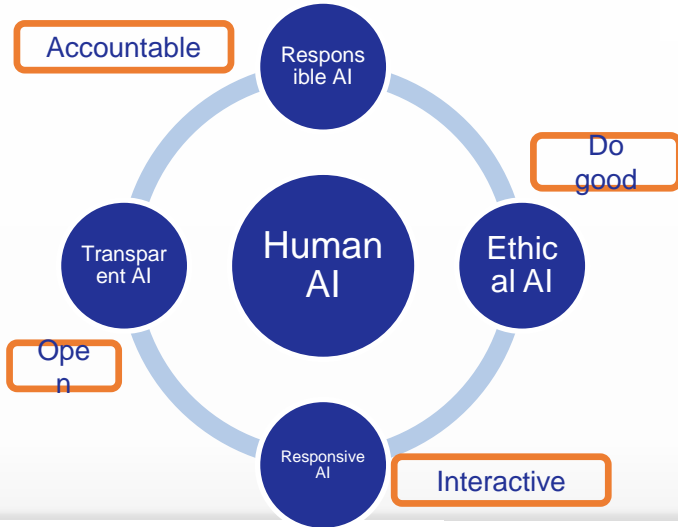
5 spin-offs
former colleagues @ DeepMind,
Prowler, MIT, CalTech, Colibra,
Sony, ...

Our research: multi-agent collaborative AI

- AI systems are not standalone
 - they act in an **environment**
 - they **interact** with **humans**



Agents in a smart grid model



- Focus on **online**, **adaptive** and **dynamic** learning algorithms
- Not only **learning**, but also **acting** from knowledge

Wind farm control

Smart energy grids

Traffic optimization

Fraud detection

Automatic document processing

Supply chain management

Robotics

Interested in connecting with us?



Ann Nowé
Director AI Lab

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Experience Center

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Leander Schietgat
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Developer AI Lab

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IDLab - Looking for AI Research Opportunities

Wouter Haerick / imec – IDLab
Gent / Research Valorization

Ilse Bracke / imec - IDLab
Antwerpen / Research Valorization



mec

IDLAB – OPPORTUNITIES FOR AI
RESEARCH TOGETHER WITH INDUSTRY

WOUTER HAERICK
ILSE BRACKE

INTERNET & DATA SCIENCE LAB

350

Internet experts and data scientists

IDLab focuses its research on *internet technologies* and *data science*. We develop technologies outperforming current solutions for communication subsystems, high speed and low power networking, distributed computing and multimedia processing, machine learning, artificial intelligence and web semantics.

+500

Collaborations with Innovative Industry

IDLab collaborates with many universities and research centres worldwide and jointly develops advanced technologies with industry (R&D centers from international companies, Flanders' top innovating large companies and SMEs, as well as numerous ambitious startups).

40+ Professors
40+ Post Docs

ICON **O&O** **EU**
Baekeland **Bilateral**

IDLAB
GHENT & ANTWERP



www.idlab.technology
www.idlab.uantwerpen.be
www.idlab.ugent.be

IDLAB – EXAMPLES OF COLLABORATION

RECENT OR ONGOING COLLABORATIONS

WITH BOTH **SMALL STARTUPS** AS **LARGE(R) COMPANIES**

A SELECTION ...

ML²GROW

FAKTION
ARTIFICIAL INTELLIGENCE. APPLIED.

BARCO

Janssen
PHARMACEUTICAL COMPANIES OF
Johnson & Johnson

ROBOVISION

sentiance

RENSON

vintecc

DAIKIN

Atlas Copco

ML6

BOLTZMANN
— machine learning —

yazzoom

TOYOTA

RESEARCH AREAS

Distributed IoT Intelligence



Learning & Data Mining



Semantic Reasoning



HYBRID AI

AUTOMATED ML



Cognitive
sensing



Low Power



Digital Twin



Complex tasks



from AI on one single sensor to managing your entire environment

LAB ENVIRONMENTS – A SELECTION ...

HOMELAB



CONNECTED CAR SMART HIGHWAY



INDUSTRY 4.0 - IIoT



SMART CITIES - DIGITAL TWIN



RESEARCH ADAPTED TO INDUSTRY NEEDS

HYBRID AI

HYBRID AI FOR SENSOR DATA STREAMS

DATA-DRIVEN AI + KNOWLEDGE-DRIVEN INTELLIGENCE



DEVICE SENSOR DATA

TELEVIC - TRAIN DATA

RENSON - VENTILATION DATA

➔ *CONTEXT LEARNING & RECONFIG*

DATA VISUALIZATION

CUMUL.IO

➔ *ADAPTIVE DASHBOARDS*

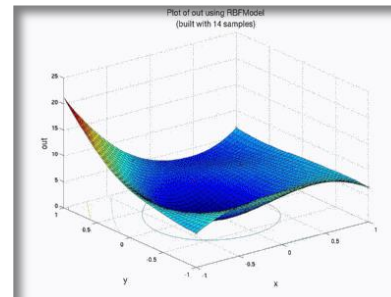
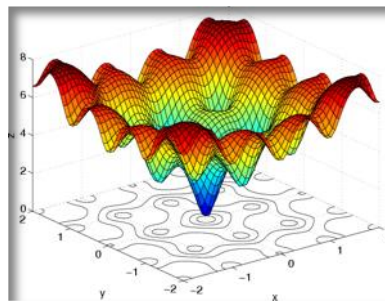
RESEARCH ADAPTED TO INDUSTRY NEEDS

AUTOMATED ML

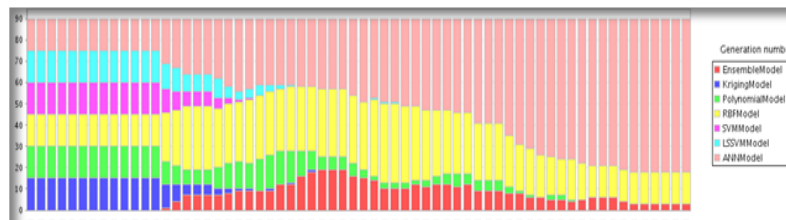
AUTOMATED DATA-EFFICIENT MACHINE LEARNING

HOW TO SELECT THE BEST ML APPROACH

- Efficient Data selection
- Model trust / selection
- Hyperparameter Optimization
 - Neural architecture search
 - Bayesian optimization
- Hybrid modeling
- Transfer learning
- Surrogates/digital twins
- ...

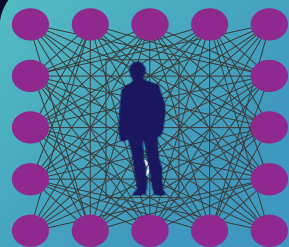


AUTOMATED MODEL COMPARISON & SELECTION





Cognitive
sensing



Device Free Localization
Crowd Density Est.



Angle of Arrival
Localization



Sensor Fusion



Low Power



ACSIM

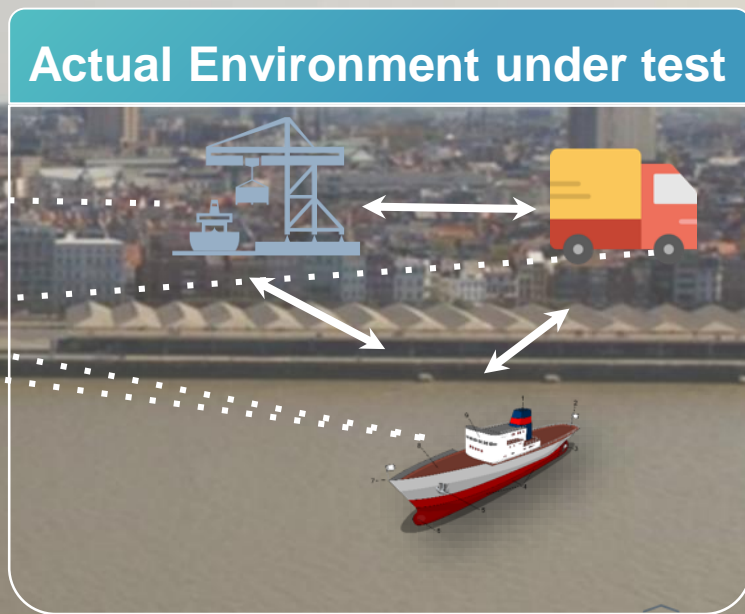
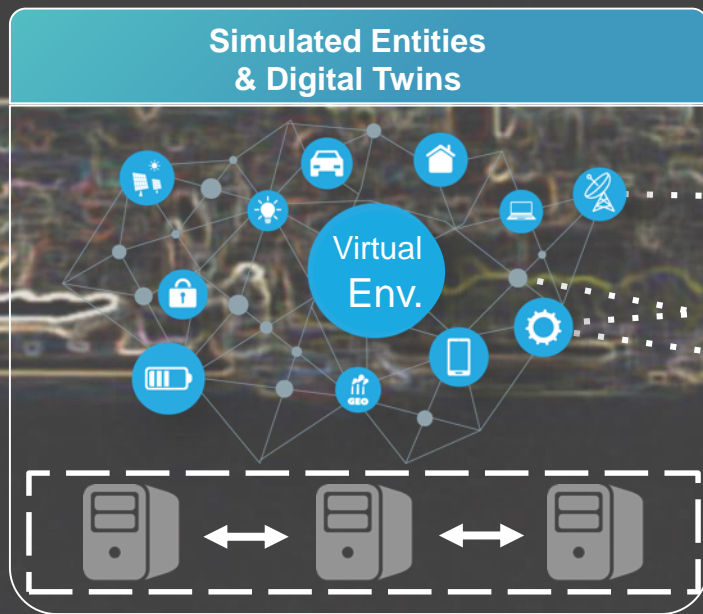
HYBRID SIMULATION TESTING PLATFORM

Digital Twin

Emergent Behavior



Global optimal behavior due to local interaction





GRAND CHALLENGE 4: HUMAN-LIKE AI

COMPLEX TASKS THROUGH REINFORCEMENT LEARNING



AI-assisted operator

Ask the AI system for help
Camera you can talk to

*How should I
assemble this part?*



Automated industry tasks

Automation of workloads
Give the AI system a complex task

*Bring me the red
parcel at row 12*

CONTACT

INITIAL IDEA?

LOOKING FOR ADDITIONAL PARTNERS?

AI RESEARCH CHALLENGE?

BUSINESS NEED WITH POTENTIAL FOR AI?

CONTACT DETAILS

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embracing a better life