

AI @ Vives in education and research

dr. Stefaan Haspeslagh





#veryvives

VIVES in numbers

19.600 students
1.900 staff
830 FTE

7 campuses
5 cities
10 student residences



6 study areas
34 bachelor degrees
24 associate degrees

2.000
traineeship companies
and institutions



In 5 cities

7 Campuses

Click to add text

Campus Oostende

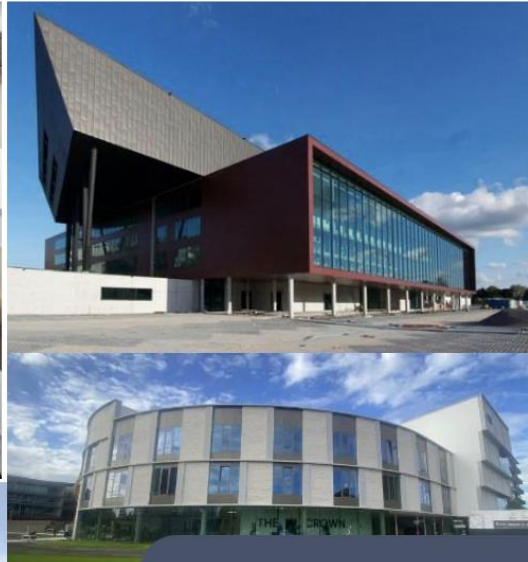
- ✓ Station
- ✓ VLOC

Campus Kortrijk

Campus Roeselare

Campus Torhout

Campus Brugge
✓ Xaverianenstraat
✓ Station





AI in education

- Informatics → AI for business (Dutch)
- Electronics – ICT → AI on embedded/IoT devices (Dutch)
- Applied Computer studies with track on AI (English, 60 ECTS)
- Summerschool Industrial AI



Applied Computer Studies (60 ECTS)

Programme

☐ Schedule | ☒ Stage1

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■ Communication

■ Business

■ Cybersecurity & Infrastructure

■ Business Software

3 ECTS	Digital Workplace	①	D		V3R451
3 ECTS	Power Tools	①	D		V3R452

■ Data & Artificial Intelligence

5 ECTS	Introduction to Artificial Intelligence	①	D		V3R902
6 ECTS	Machine Learning - Fundamentals	①	D	=	V3R312
5 ECTS	Data Engineering	①	D		V3R903

■ Software Development

3 ECTS	Programming in Python	①	D	=	V3R301
5 ECTS	Android App Development	①	D		V3R904
5 ECTS	Full-Stack Development in .NET	①	D		V3R905
5 ECTS	Mobile App Development iOS	①	D		V3R906
3 ECTS	Node.js Development	①	D	=	V3R305
5 ECTS	IT-project	①	D		V3R907



Summerschool Industrial AI

Summerschool Industrial AI — Bruges 2025					
	MONDAY 2 June	TUESDAY 3 June	WEDNESDAY 4 June	THURSDAY 5 June	FRIDAY 6 June
08.00 - 09.00					
09.00 - 10.00					
10.00 - 11.00	WELCOME Introduction to the programme	AI Fundamentals Stefaan Haspeslagh	Data Science Ruben Buysschaert	AI Machine Learning Stefaan Haspeslagh	AI Deep Learning Wouter Verstraete
11.00 - 12.00					
12.00 - 13.00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
13.00 - 14.00	CITY TOUR BRUGES	AI Industry Mathias Verbeke KUL	Data Science Practical Ruben Buysschaert & Franky Loret	Company Visit CNHi	AI Deep Learning Practical Wouter Verstraete
14.00 - 15.00					
15.00 - 15.30	Visit to HALVE MAAN	Coffee Break	Coffee Break		Coffee Break
15.30 - 16.30		Brainstorm AI Project Wouter Verstraete	Data Science Practical Franky Loret & Ruben Buysschaert	AI Project Wouter Verstraete	AI Deep Learning Practical Wouter Verstraete
16.30 - 17.30					
17.30 - 18.00				Dinner	
18.00 - 19.00					



Summerschool Industrial AI

Summerschool Industrial AI — Bruges 2025					
	MONDAY 9 June	TUESDAY 10 June	WEDNESDAY 11 June	THURSDAY 12 June	FRIDAY 13 June
08.00 - 09.00		Breakfast session	AI Ethics Tomas Folens		
09.00 - 10.00	AI Model deployment Wouter Verstraete	AI EDGE Impulse Jonas Lannoo		AI What's Next Wouter Verstraete	AI Project Wouter Verstraete
10.00 - 11.00					
11.00 - 12.00					
12.00 - 13.00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
13.00 - 14.00	AI EDGE Tensorflow lite Jonas Lannoo	AI EDGE Impulse Practical Jonas Lannoo	AI & Business	Company Visit Bluebridge	AI Project Pitching
14.00 - 15.00					
15.00 - 15.30	Coffee Break	Coffee Break	Coffee Break		
15.30 - 16.30	AI EDGE Tensorflow micro Jonas Lannoo	AI Project Wouter Verstraete	AI Project Wouter Verstraete	AI Project Wouter Verstraete	Closing Session Reception & Dinner
16.30 - 17.30					
17.30 - 18.00					
18.00 - 19.00					



Flax – House of AI - www.theflax.be



- an experience based on storytelling and gamification that showcases technological advancements in the field of AI
- Broad dissemination of AI possibilities and research



Gefinancierd door
de Europese Unie
NextGenerationEU



Roadmap AI

TRL	1	2	3	4	5	6	7	8	9
Activity	Discovery & Research		Innovation					Commercialisation	
Description	basic principles observed	application formulated	experimental proof of concept	lab validation	(system or component) validation in relevant environment	demonstrator in relevant environment	system prototype demonstrated in operational environment	system complete and qualified (test & demo) in operational environment	actual system proven in operational environment

	Education	(Health)care	Logistics	Supply chain management
Combinatorial optimisation				
Predictive analytics				
Tensor techniques				

<u>GenAI</u>
<u>AI Agents</u>

- Strong emphasis on AI adoption and AI literacy → holistic approach towards responsible AI
- For SMEs



AI and planning

- Problem:
 - assignments of shifts to employees with a certain qualification
 - considering a large number of constraints and preferences

	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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G																			D	D	D	V						
H											V	V	D	D	D					L	L	L						



AI and planning

- **Problem size:**

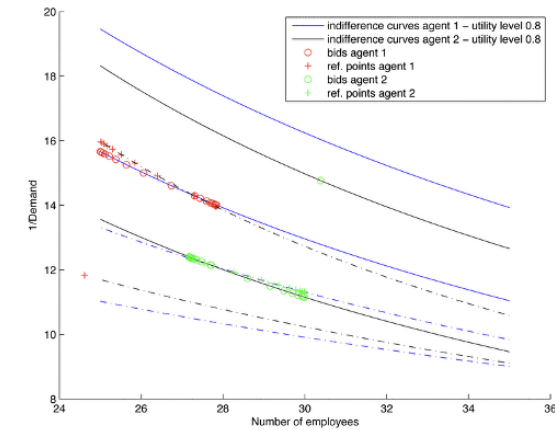
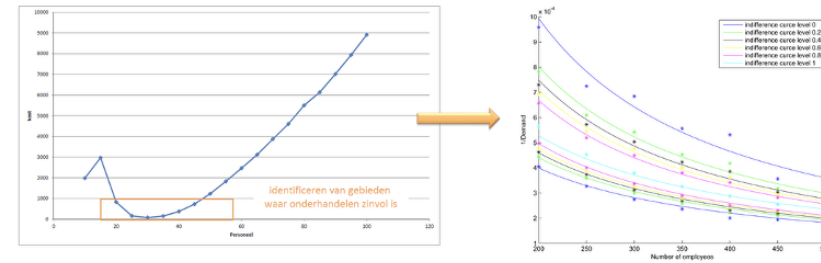
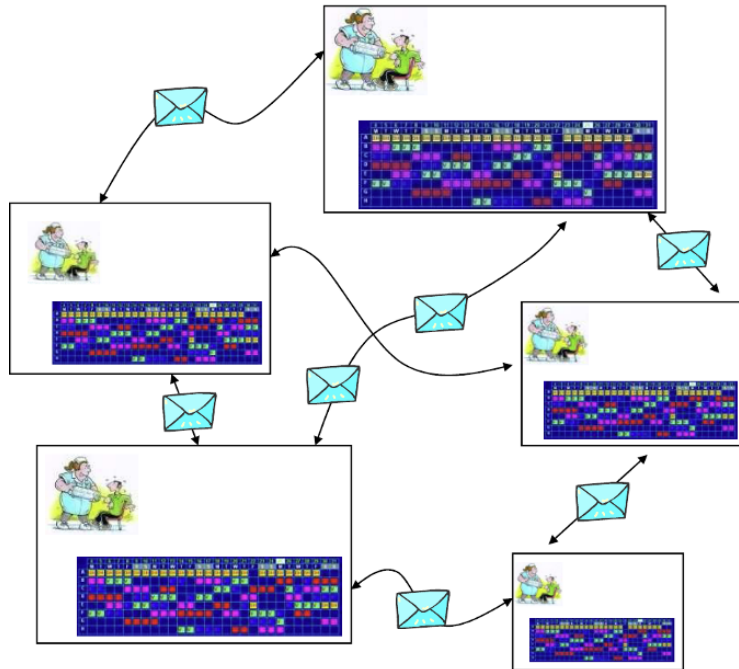
- Small example:
 - 4 shifts to schedule
 - 10 possible employees
 - 7 days

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B	L	L	V	V	V					D	D		L	L	L	D	V	V							D	D	D	D
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E			L	L	D	V	V	D	D		L	L			N	N		D	DH				D	V	V	V	DH	DH
F	V	V	D	D				L	L	L	N	N	N	N		L	L		V	V	V	D		N	N			
G					N	N	N	N											D	D	D	V					L	L
H											V	V	D	D	D		N	N		L	L	L						

- Number of variations on 1 day = 5040
 - For 1 week: number of possible rosters = $5040^7 = 8,26e25$
 - For 1 month: number of possible rosters = $5040^{30} = 1,18e111$

AI and planning

- Workforce planning as an example – resource planning



AI and planning

The Problem

A fleet of **heterogeneous vehicles**, is tasked with **transporting passengers**, who need **special care**, from their pickup locations to their destinations while satisfying **customer-specific constraints**, such as time windows and ride time.

Our Objective

Building a **decision support system** to:

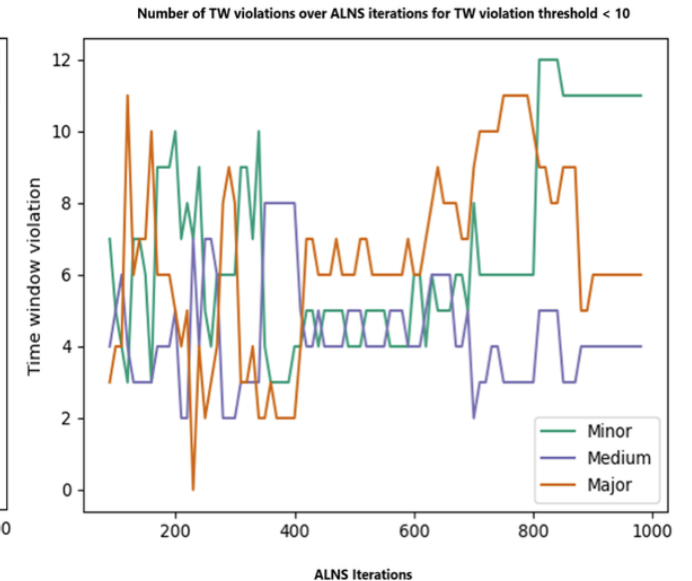
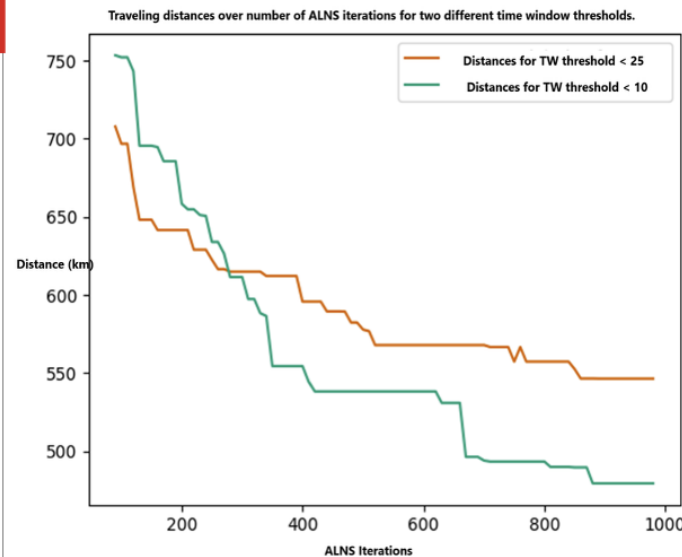
- automate the routing and service time scheduling using **AI**.
- reduce overall **cost** of transportation
- reduce **waiting time** and **travel time** of customers and hence **improve customer satisfaction**
- **learn preferences** from human planners



AI and planning

Results

- ✓ Handling more than **100 requests**
- ✓ All requests served with **lower number of vehicles** compared to human solution
- ✓ Total **traveling distance reduced** and hence **reduced cost**.
- ✓ **Time window violations minimised**
- ✓ Computational Time: **< 20 minutes**





AI in health - KidneyAID

- Acute Kidney failure (AKI):
 - Sudden loss of kidney function, leading to the buildup of toxins, fluid imbalances, and disrupted waste removal
 - Can cause life-threatening complications such as heart issues, infections, and long-term kidney damage.
- Augmented Renal Clearance:
 - a condition of excessive kidney filtration
- Objectives:
 - Development of a platform (KidneyAid) to bring AI models developed in fundamental research on kidney failure to bedside
 - Prospective (clinical) validation of the models
 - Progress in the regulatory path towards registration of the KidneyAid as a CE-marked medical device.





Thank you!

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