Welcome to Maastricht University

Department of Data Science and Knowledge Engineering

MSc Artificial Intelligence
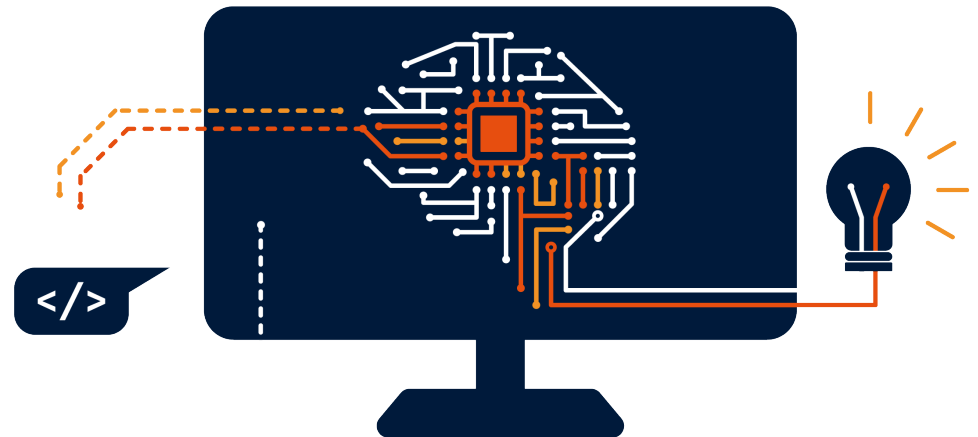# MSc Data Science for Decision Making

Prof. Mark Winands

Professor of Machine Reasoning

Director of Studies

Tessa Fox

Study Advisor

Data Science & Artificial Intelligence in the news

13 Industries Soon To Be Revolutionized By Artificial Intelligence

Forbes Technology Council CommunityVoice

POST WRITTEN BY

Expert Panel, Forbes Technology Council

Successful CIOs, CTOs & executives from Forbes Technology Council offer firsthand insights on tech & business.

What can I become /make ?

"Designer of Intelligent Products"

Possible jobs:

- Data Scientist / Analyst
- Knowledge Engineer
- Project Manager
- Researcher
- Business Analyst
- Software Engineer
- …

Sample products:

- medical devices
- data mining tools
- intelligent user interfaces
- gaming
- social/cognitive robots
- scheduling/planning tools
- mobile apps
- …

Artificial Intelligence

- **Design** intelligent systems capable of learning and autonomous decision-making ("agents")

- **Apply** these systems in order to solve complex problems efficiently and automatically

Data Science for Decision Making

- **Extract** useful information from large data sets to recognise patterns and anomalies

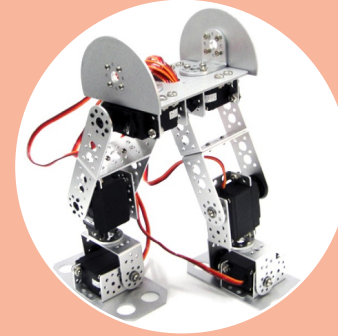- **Provide** the mathematical tools to model and handle this information

What will I learn?

Convert data into knowledge and information…

(shopping behaviour)

Formalizing human knowledge into a computer-usable format…

(modelling heart behaviour)

Using knowledge to design efficient solutions

(development of an efficient modular working robotic platform)

Project Centred Learning (PCL)

Working in small groups
- Project management
- Group dynamics
- Deadlines, deliverables, products
- Communication: reports, presentations

Specific Group Topics
- Academic challenge
- Research / Business question
- Individual project supervisor

Recent Project Topics

- Finding "Banksy" through Image Processing

- Automatic Generation of Contextual Celtic Knotwork

- Modeling Human Decision Process from Intercranial EEG

- Relating component responses between rats and humans

- Kick-optimization for Robotic Soccer

Emergent Tech ▶ Artificial Intelligence

Financieel Dagblad
(NL)

De Morgen
(BE)

El País
(ESP)

MOST READ

Gospel according to HPE: And lo, on the 32,768th hour did thy SSD give up the ghost

We are absolutely, definitively, completely and utterly out of IPv4 addresses, warns RIPE

Organisation of Education

- Both programmes: 2 years
- International student population
- Full-time programme

Year 1

| Period 1		Period 2		Period 3		Period 4		Period 5		Period 6	
7 weeks 2 courses	E x a m s	7 weeks 2 courses	E x a m s	3 weeks Full time Project work	R e s i t s	7 weeks 2 courses	E x a m s	7 weeks 2 courses	E x a m s	3 weeks Full time Project work	R e s i t s
------------- Research Project 1 ------------						------------- Research Project 2 ------------					

Courses

Artificial Intelligence

CORE COURSES
- Foundations of Agents
- Multi Agent Systems
- Intelligent Search and Games
- Advanced Concepts in Machine learning
- Autonomous Robotic Systems
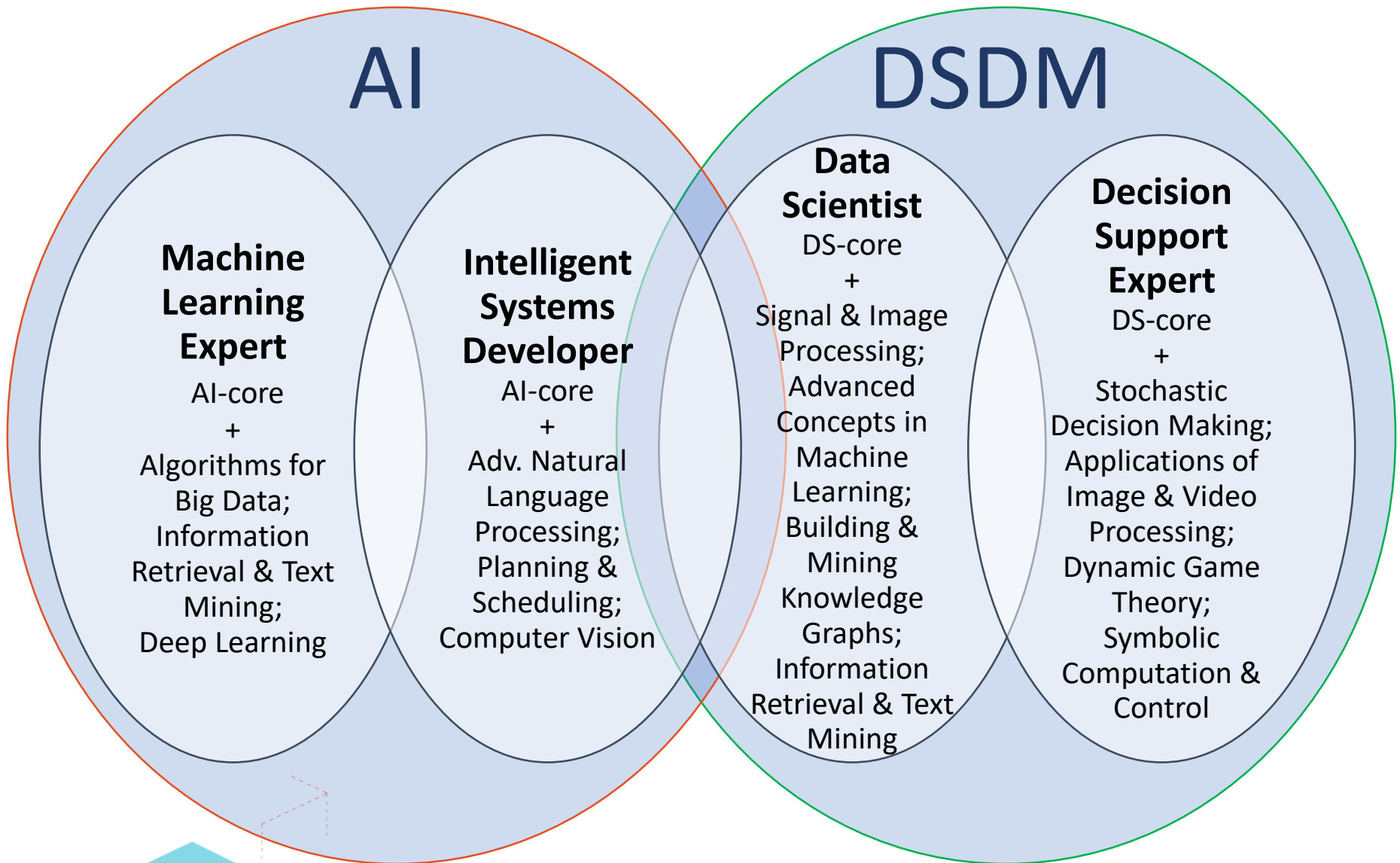
Data Science for Decision Making

CORE COURSES
- Data Mining
- Model Identification and Data Fitting
- Algorithms for Big Data
- Planning and Scheduling
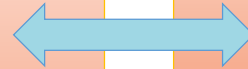
ELECTIVE COURSES (both programmes)

- Algorithms for Big Data
- Dynamic Game Theory
- Building and Mining Knowledge Graphs
- Information Retrieval and Text Mining
- Computer Vision
- Planning and Scheduling
- Deep Learning
- *Advanced Natural Language Processing*

- Signal and Image Processing
- Mathematical Optimization
- Stochastic Decision Making
- Advanced Concepts in Machine Learning
- Applications of Image & Video Processing
- Information Security
- Symbolic Computation and Control
- Computational Statistics

Examples of Specializations

AI

DSDM

**Machine Learning Expert**

AI-core
+
Algorithms for Big Data; Information Retrieval & Text Mining; Deep Learning

Intelligent Systems Developer

AI-core
+
Adv. Natural Language Processing; Planning & Scheduling; Computer Vision

Data Scientist

DS-core
+
Signal & Image Processing; Advanced Concepts in Machine Learning; Building & Mining Knowledge Graphs; Information Retrieval & Text Mining

Decision Support Expert

DS-core
+
Stochastic Decision Making; Applications of Image & Video Processing; Dynamic Game Theory; Symbolic Computation & Control

Organisation of Education

Year 2

Study abroad | Research internship | Business internship

Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
Elective Semester - Elective courses from the other master - Research internship - Business internship - Elective courses at another Faculty of Maastricht University (FPN, SBE) - Study abroad			Master's Thesis (at DKE, companies, or other faculties)		

Examples of Recent Thesis Topics

- Detecting normal and abnormal behaviour using trajectory information, aimed at people with dementia

- Safety-proof for driver assistance systems using generative models

- Extending cross-conformal prediction to efficiently identify high-risk insurance claims

- Forecasting daily revenues for a cafe chain

- Robust line planning in public transport
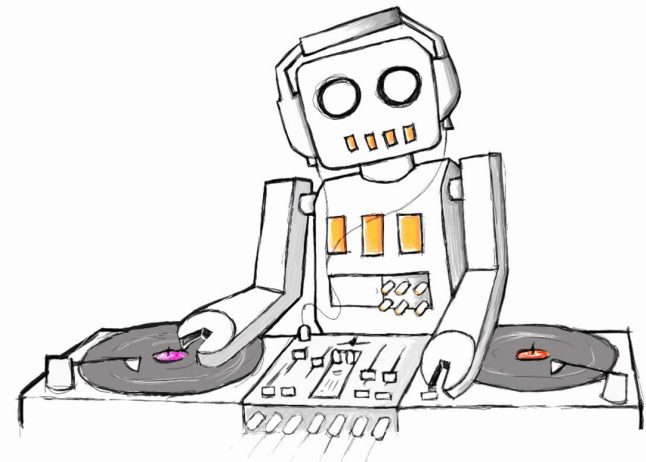
Admission Requirements

Bachelor of Science in

Data Science and Knowledge Engineering

(or equivalent in related field, e.g. Artificial Intelligence, Applied Mathematics, Computer Science)

Bachelor of Science in

Data Science and Knowledge Engineering

(or equivalent in related field)

from a University of Applied Sciences (HBO) or equivalent

Deadlines:
1 May/1 June
Fall Semester

15 December
Spring Semester

Premaster Programme is available!

Exemptions Request
>
Board of Examiners
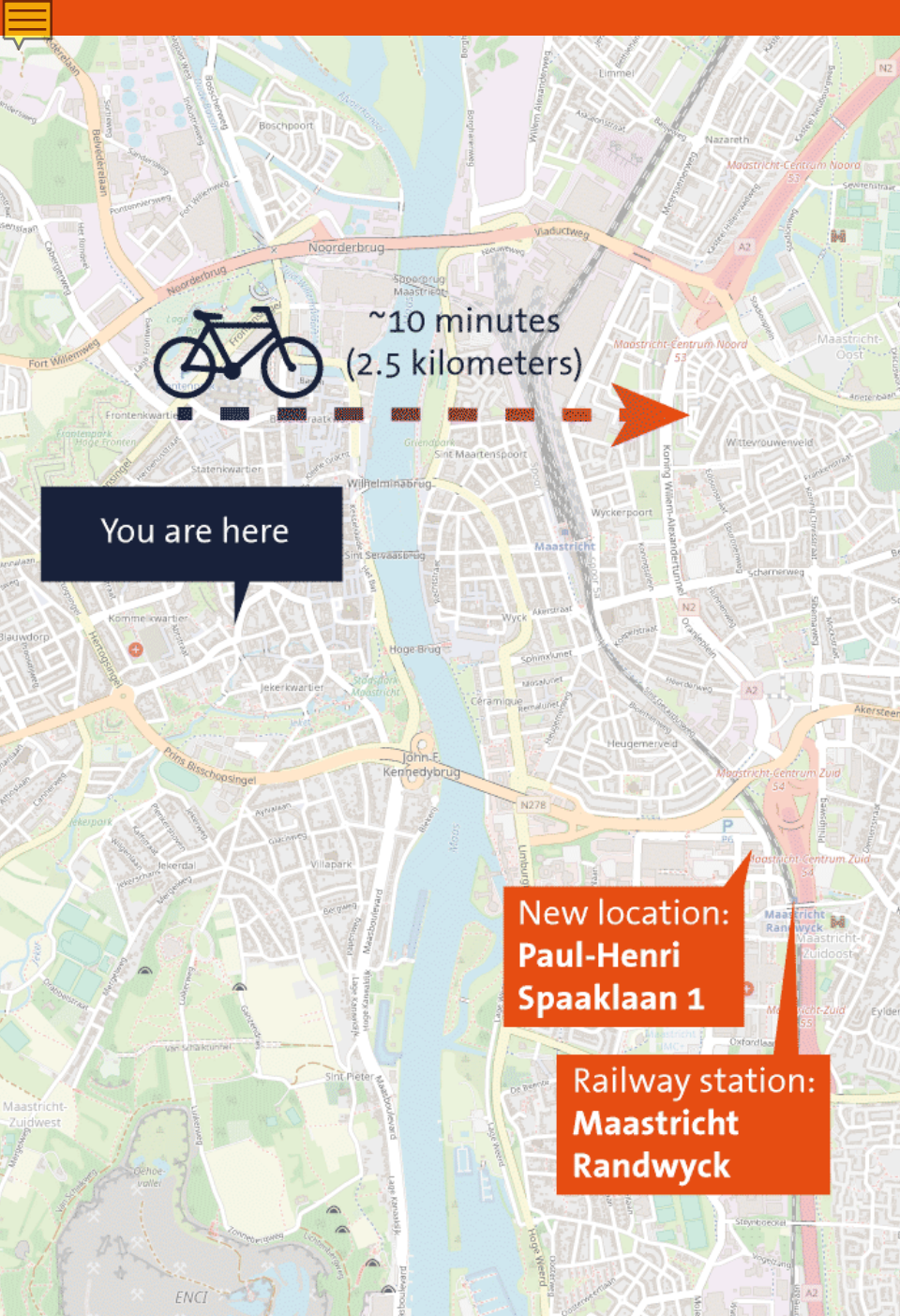
~10 minutes
(2.5 kilometers)

You are here

New location:
**Paul-Henri
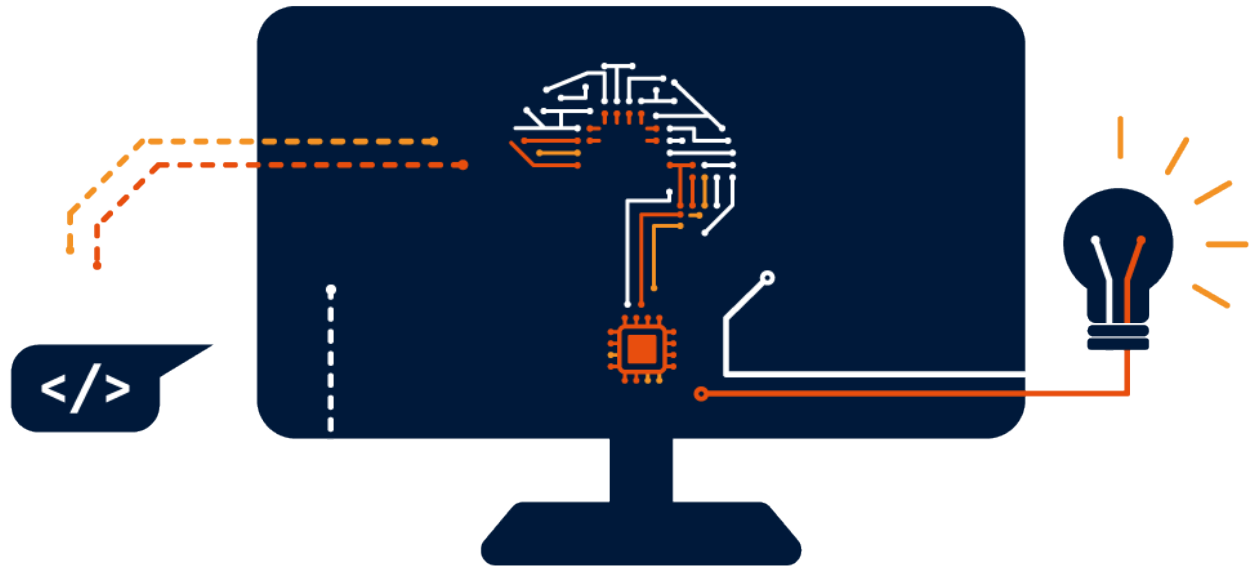Spaaklaan 1**

Railway station:
**Maastricht
Randwyck**

Paul-Henri Spaaklaan 1

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/UM_DKE

/UM_DKE

Questions?

Contact us via
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