

Welcome to Maastricht University

Department of Data Science and Knowledge Engineering



MSc Artificial Intelligence & MSc Data Science for Decision Making

Dr. Kurt Driessens

Associate Professor

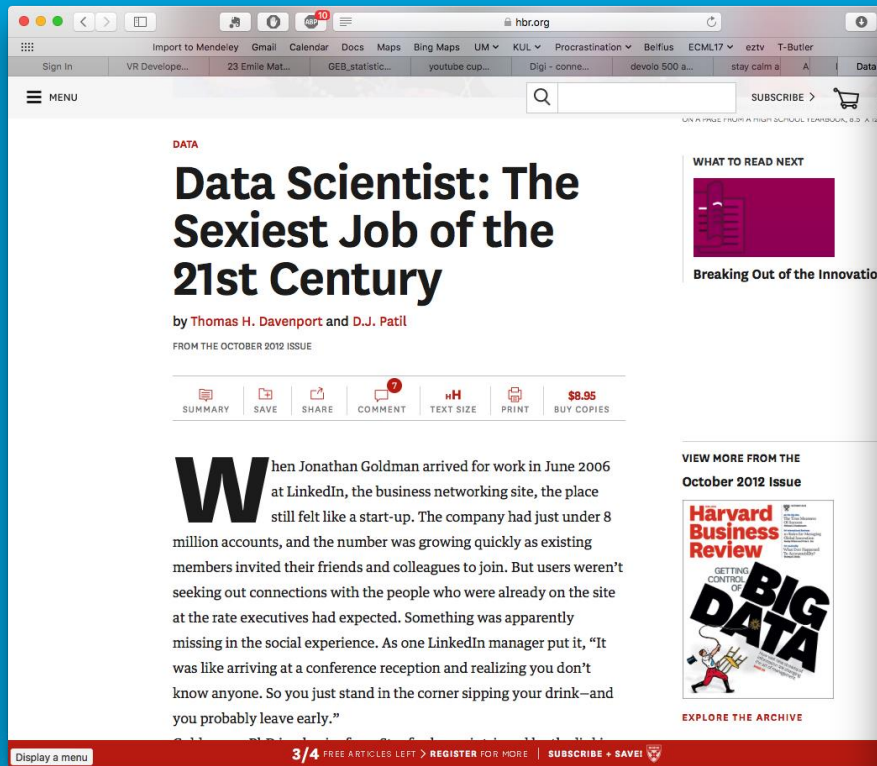
(& Head of the Programme Committee)

Tessa Fox

Study Advisor



Data Science & Artificial Intelligence in the news



DATA

Data Scientist: The Sexiest Job of the 21st Century

by **Thomas H. Davenport** and **D.J. Patil**

FROM THE OCTOBER 2012 ISSUE

SUMMARY SAVE SHARE COMMENT TEXT SIZE PRINT BUY COPIES \$8.95

When Jonathan Goldman arrived for work in June 2006 at LinkedIn, the business networking site, the place still felt like a start-up. The company had just under 8 million accounts, and the number was growing quickly as existing members invited their friends and colleagues to join. But users weren't seeking out connections with the people who were already on the site at the rate executives had expected. Something was apparently missing in the social experience. As one LinkedIn manager put it, "It was like arriving at a conference reception and realizing you don't know anyone. So you just stand in the corner sipping your drink—and you probably leave early."

WHAT TO READ NEXT

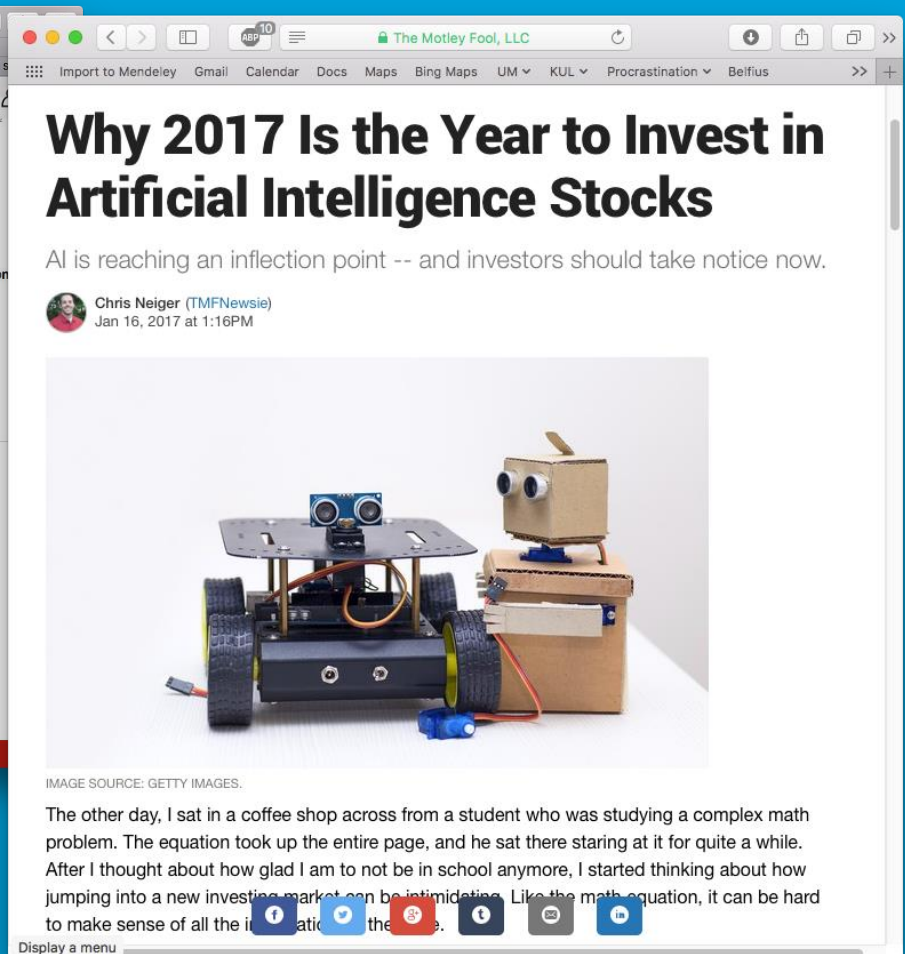
Breaking Out of the Innovation

VIEW MORE FROM THE October 2012 Issue

Harvard Business Review GETTING CONTROL OF BIG DATA


EXPLORE THE ARCHIVE

3/4 FREE ARTICLES LEFT REGISTER FOR MORE SUBSCRIBE + SAVE!



Why 2017 Is the Year to Invest in Artificial Intelligence Stocks

AI is reaching an inflection point -- and investors should take notice now.

 **Chris Neiger** (TMFNewsie)
Jan 16, 2017 at 1:16PM

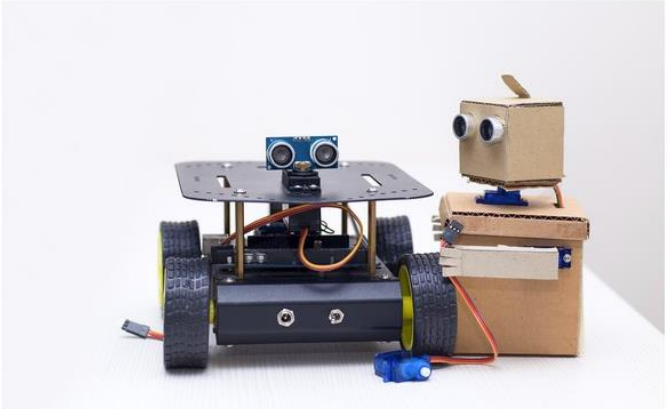


IMAGE SOURCE: GETTY IMAGES.

The other day, I sat in a coffee shop across from a student who was studying a complex math problem. The equation took up the entire page, and he sat there staring at it for quite a while. After I thought about how glad I am to not be in school anymore, I started thinking about how jumping into a new investing market can be intimidating. Like the math equation, it can be hard to make sense of all the information the

Display a menu

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

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



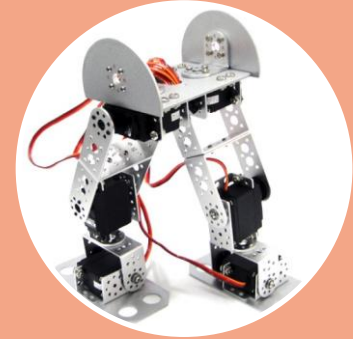
What will I learn?



**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



Organisation of Education

- Both programmes; 2 years!
- International student population
- Full-time programme

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

Examples of Specializations

AI

Machine Learning Expert

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

Intelligent Systems Developer
AI-core
+
Dynamic Game Theory
Planning & Scheduling
Computer Vision

DSDM

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
intern
ship

Business
intern
ship



PHILIPS

ZyLAB®

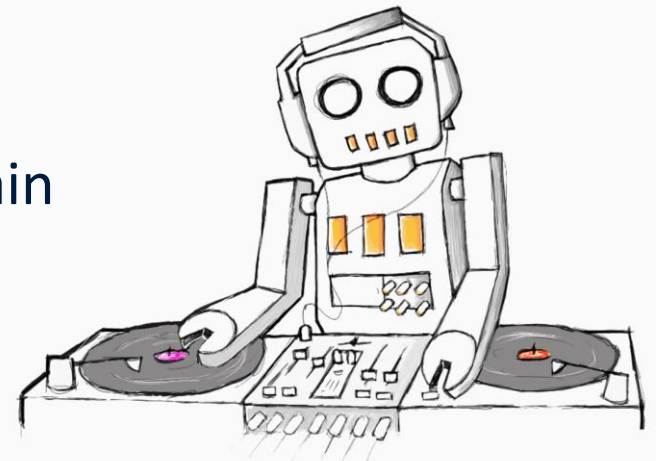
Medtronic



Period 1	Period 2	Period 3	Period 4	Period 5	Period 6
<p>Elective Semester</p> <ul style="list-style-type: none"> - Elective courses from the other master - Research internship or - Business Internship - Elective courses at another Faculty of Maastricht University (FPN, SBE) - Study abroad 			<p>Master Thesis (at DKE, companies, or other faculties)</p>		

Examples of Recent Thesis Topics

- Detecting Normal and Abnormal Behaviour using Trajectory Information, Aimed for 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, Mathematics, Computer Science)

or

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
- December 15
Spring Semester

Premaster Programme is available!

**Exemptions Request
> Board of Examiners**



Questions ?

Contact us via:

info-dke@maastrichtuniversity.nl