Finding the way through the data jungle

As our world is digitizing at a rapid pace and data is everywhere, our society faces a huge wave of bits and bites, containing information about you, me and the world around us. How can we stay in charge of our information? We asked three AI experts, about the impact of Artificial Intelligence as a tool to oversee complex data streams and the opportunities of deploying it for better and more reliable data within our society.

Introducing:

Stijn Hoppenbrouwers
Lecturer HAN University of Applied Sciences

Gerard Schouten
Professor moral design strategy at Fontys University of Applied Sciences

Wouter Teeuw
Lector Ambient Intelligence at Saxion University of Applied Sciences

Hoppenbrouwers: "We are dealing with a growing amount of data, so there are also shifts in how to deal with it", "In two ways, the availability and quality of data are hugely important. The whole digitalization from A to Z depends entirely on data. Too often it is assumed that the data will be fine and that you can do with it whatever you want. It isn't. If it's not there or is inaccurate, you have to stop. The data has to be right first. that's why we started DEMAND: Data-Engineering and Management in Data chains."

Making data more mature

Schouten: "AI has been making daily headlines lately. Large companies are energetically tackling implementation, but for small companies it is more difficult to implement AI in a mature way. We aim at improving the 'data maturity' of companies and governments. A lot of research focuses on social issues or improving processes at companies. but we can really make a difference if we tap into small businesses, connect with students and conduct case studies for companies and government agencies to optimize data use."

Teeuw: "We do this by putting together a toolbox. Imagine: a city wants to use smart lighting. Data offers us insights as to where and when people drive less or more. The toolbox helps to collect that data, constantly updated through sensors to a cloud platform. This huge amount of data needs to be cleaned up and prepared so that the AI software receives exactly what is needed to make predictions. We are not so much focused on solving the problem with that lighting alone, but we want to streamline the process and implementation of data. and create tools to support small companies in doing so."

THERE'S ALSO A RISK OF DROWNING IN DATA

When data becomes dangerous

Hoppenbrouwers: "With 10,000 times more data, you can basically do more, but there's also a risk of drowning in data."

Schouten: "In the application of data there is still a lot of ignorance; the algorithms are known, but the application is not. This is also mainly about quality aspects. If you want to use data intelligently, before you know it you will create a model that discriminates against certain groups. You have to address this quality aspect. Suppose that you have more men than women as categories, that can cause very strange outcomes. Think of the benefits affair, for example. This algorithm excluded certain groups or made them pay more. There are still large gaps in precisely these quality aspects. By trying this out in practice, we want to tackle and solve this issue. We also want to work on the explainability of models."

Teeuw: "If you look at that data, there is a technical side and a human side to it. The technical side is the whole flow of data from acquisition to analysis and feedback. How can you get that right? With a smooth flow of data and learning from data and then automating it. On the other hand, you have the people side. Anyone who starts working with data will get advice from AI as from a learning system. Do you trust that too or are you going to do things differently anyway? You can know better and the system can also make mistakes. AI is not always right. You can also make your system's decisions transparent, so people can trust it. At Saxion, that is a point of focus."

AI needs people

Hoppenbrouwers: "Many students are interested in AI and decide to pursue an AI-focused degree or master's program. And they need to, because the field is starved for data-focused experts. But we do notice

that at first, the participants think mainly of apps. It is far from clear to many students how important AI will be for us in the future and why exactly they should choose an AI education. Many beginning students are not yet aware of the whole world of possibilities and activities that data has to offer. To make students more aware of the importance of AI, we desperately need the help of companies. They need to make it clear how important and interesting it is. If the work field itself says that AI is important, students are more eager to this faster."

WE ARE TRAINING TOO FEW PEOPLE, RATHER THAN TOO MANY

Schouten: "Practically all students find a job immediately after graduation. And I see the demand around AI increasing, so I think we are training too few people rather than too many. We would like to join forces with Fontys and the Technical University about how we can train more people."

Hoppenbrouwers: "To respond to the popularity of AI and the high demand for data-oriented experts in the market, we are now in the midst of implementing various changes within our offerings. We have a new master's program as of September 1, 2023; Applied Data Science & AI. in it's first year, we already had to create a waiting list for the second class. We are assuming that this will run like crazy. It is a part-time master, aimed at working people.
We also have a special profile for beta engineering within our HBO ICT master's programs. At the bachelor level, we have a specialist course. Furthermore, we are teaching students from all kinds of fields to deal with data and implement MAI devices. Think of healthcare, other forms of engineering, business administration and more.
All of these fields are looking at what they should and can do with this for their students and research."

Schouten: "At Fontys, we already offer a lot of AI education, too.
Our students can choose from two semesters devoted entirely to AI.
We also have a dedicated minor; AI For Society. All students from, for example, the nursing or journalism program can register. Within the minor they work on a practical AI problem. Recently, we also have an applied master's program called Applied IT. This contains quite a lot of AI. The one-year master's programme has just started. We are trying to implement AI in various disciplines. Think of the Fontys Paramedical College. They want to do a lot with AI because it changes their practice. This also applies to Fontys Journalism."

Teeuw: "At Saxion we have the bachelor HBO ICT. This is a broad bachelor mainly about software engineering. However, it does contain specialisations such as big data technologies and business improvement with data. Soon, we will also start the HBO master's in ICT: Software Engineering. In this master's, the emphasis will very much be on data. Furthermore, in 2024 we want to start the new bachelor Applied Data Science & AI in Apeldoorn. We really want to set up a knowledge ecosystem for the Southeast Netherlands. Maybe even for the whole of the Netherlands!"

Hoppenbrouwers: "Eventually, we want to realise a physical data lab, where we can explore and work with all sorts of data intensive acitivities. We really want to give such a hub a function. What comes naturally then are all kinds of questions about data engineering and data management. We want to use it as an incubator for interdisciplinary projects where we can fully connect with DEMAND for a data foundation. For now, our choice for such a data lab has fallen on the Noviotech Campus in Nijmegen. Here, we will establish our physical lab with the HAN. Initially, this will be about the companies on campus. The lab is a facility supported by the campus as an organization in which all companies are cordially invited to participate. Also organisations outside the campus. For example, the Nijmegen hospital CWZ is also interested in joining what is happening at Noviotech Campus. The same goes for the data lab of Fontys in Eindhoven and Saxion in Deventer. These can also be stand-alone activities that are being expanded, at the initiative of DEMAND."

DEMAND is a collaboration between Fontys, HAN and Saxion to further already existing cooperation. Hoppenbrouwer, together with Gerard Schouten (lecturer at Fontys University) and Wouter Teeuw (lecturer at Saxion University) is in the lead for the project, aiming to provide new methodologies and tools to oversee complex data streams. The project researches technologies such as algorithms and transformations, as it also looks to build data chains as efficiently as possible. The three main themes within the project are data engineering, data management and AI engineering. The latter is about classifying AI into professional and functioning software.

ONE PAGE INNOVATION

Plasmacure puts lightning in a plaster

TACKLING CHRONIC WOUNDS WITH COLD PLASMA

"More people die each year from the effects of chronic wounds than from breast and prostate cancer combined", says Bas Zeper, CTO of Nijmegen-based health tech company Plasmacure. Yet wound healing has received relatively little attention. Perhaps because wound healing is not an independent medical specialty. "We know oncologists, but no woundologists", he said.

With Plasmacure, Zeper has marketed an innovative, disruptive treatment for wound healing. It involves a type of plastic plaster that is temporarily applied to the wound. With a strong electrical pulse - a lightning bolt - generated in a specially designed device, the air present under that plaster is ionized, creating cold plasma that can stimulate wound healing. Cold plasma consists of charged molecules (ions) that react to their environment and bind very quickly to bacteria, for example. This is exactly what is intended.

BAS ZEPER
FOUNDER & CTO
PLASMACURE

TACKLING CHRONIC WOUNDS

Zeper is a business developer pur sang. He learned the trade at Philips, where he researched whether discoveries in the industry could be made into business. After a time as an independent consultant in this field, he wanted to get involved in practical implementation. "Through contact with the Department of Physics and Electrical Engineering at TU Eindhoven, I became enormously excited to start using cold plasma for medical applications", says Zeper. Not much later, this resulted in the creation of Plasmacure, a company that uses lightning in a plaster to tackle chronic wounds head-on.
Translating an academic idea into a working product is not easy. "You have to jump through a lot of hoops," says Zeper, "but by now, that's in the past. Our product is on the market, we have a good business team, and supply hospitals and healthcare facilities.
We are now working on greater recognition for the product and wide acceptance in the healthcare industry. And

Plasmacure's cold plasma pulser

eventually we want health insurance companies to start reimbursing the treatment if it is prescribed by medics."

HOME TREATMENT

That treatment looks simple. A nurse or caregiver applies the pad and activates it with the small mobile device. Effectively, the treatment takes about two minutes, and the effect is immediate, says Zeper. "A patient with a chronic wound is often visited weekly or twice a week for wound care. This treatment, which you can complete in about five minutes, is easily applicable during home consultations."

The device that activates the plaster can be rented, purchased or borrowed to experience how it works. Plasmacure supplies the single-use, special cold plasma pads. Zeper: "Patients can currently go to a few hospitals for the treatment. The intention is that the treatments will mainly be carried out by home care organisations.
Device and pads are easily transportable and the patient can be tended to at home, saving a lot of time and travel expenses for both patients and caregivers. It is how we are going to tackle chronic wounds."