



B A C K G R O U N D

Lack of funding leaves Dutch AI lagging

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Several initiatives to promote AI research in the Netherlands have emerged over the past two years. Bits&Chips asked foremen Max Welling, Frank van Harmelen and Maarten de Rijke to highlight the importance of artificial

intelligence for Dutch economy and Dutch society.

There are three major players on the worldwide AI stage: China, the US and Europe. America has been leading in investments. China is quickly catching up as a top contender, specializing in machine learning – which is also the main focus of the US. The power of Europe stems from its broad basis.



Frank van Harmelen is a professor in the AI department at the Vrije Universiteit Amsterdam and one of the Dutch intermediaries of Claire.

“Europe has a strong history in artificial intelligence,” says Frank van Harmelen, a professor in the AI department at the Vrije Universiteit Amsterdam (VU). “To this day, most publications on AI originate in Europe.” However, Europe is highly divided. In China, investments are led by a centralistic state, whereas in the US, the investments come from big tech companies like Google and Microsoft. The European Committee decided large investments in AI are necessary for Europe to keep up with the Americans and the Chinese.

Machine Learning Conference



On 11 March 2020, Bits&Chips is organizing the second edition of the [Machine Learning Conference](#) at the Verkadefabriek in 's-Hertogenbosch. In addition to the keynote speech by NXP's Nicolas Lehment, there will be several sessions delivered by managers, engineers and researchers sharing ML experiences in a broad range of high tech domains, such as automotive, energy, health and semicon.

While Europe realized the importance of AI investments and started organizing the field, the Dutch political landscape seems to be still lagging. Van Harmelen feels the Netherlands has much to improve upon in terms of decisiveness. “Here, we endlessly look for support, bring parties together and organize roundtables in The Hague – it just takes so much time. In the meantime, research hurtles on.”

“AI is just an immensely important part of modern technology and economy,” says Max Welling, a professor in machine learning at the University of Amsterdam (UvA). He compares artificial intelligence to the arrival of computers or the Internet. “All technologies will advance using AI. That also poses challenges for society. We need to keep up with the revolution. Right now, we’re falling behind. Not because we don’t have the knowledge, but by

how our society is responding.”

Our surrounding countries – England, France, Norway, Germany and Belgium – have all announced major investments. The Netherlands hasn’t invested at all. “We were one of the first to have AI bachelor’s and master’s programs. Other countries decided to make large investments. We did not,” states Maarten de Rijke, a professor of AI and information retrieval at UvA. Welling concurs: “We’ve been writing reports, but there haven’t been any real investments yet.”

Talent and capacity

On a European level, Claire and Ellis are the major initiatives for collaboration on AI research (see boxes). In the Netherlands, the Dutch AI Coalition was introduced to bring all initiatives together and function as a lobby towards The Hague. Welling: “It’s highly important to inform Dutch politics on the necessity of AI investments. Within The Hague, very few people have knowledge in this area. The Dutch AI Coalition will explain to them why AI is so important to the Dutch economy, how society is changing as a result and what we need to do to prevent us from falling behind.”

Ellis

The European Laboratory for Learning and Intelligent Systems (Ellis) focuses on machine learning-driven AI. Its primary goal is to create a European network of excellence. Its first measure was to set up 11 research programs, all of which focus on a specific topic. Each program was assigned 15 fellows, all leading members of the research community. The second measure was to establish the Ellis units. These are virtual organizations set up across Europe, to which Ellis faculty is appointed. The faculty members and fellows can

recruit PhD candidates and postdocs. About 1.5 million euros a year is involved in each unit. In the Netherlands, Amsterdam and Delft have an Ellis unit. In Belgium, there's one in Leuven. Max Welling is a co-founder and board member of Ellis and the director of the Amsterdam unit.

Welling has a prominent role in Ellis. “Ellis believes machine learning is the driving force behind the AI revolution,” he describes. “There's an enormous increase in economic activity of AI. According to us, this is because of data-driven AI, also called machine learning.” Many other research topics, like robotics, language processing and image processing, use machine learning as their inherent technology. Ellis's broad selection of topics stems from its bottom-to-top proposal structure. “We do have a selection committee, but in principle, they're all grass-roots.”



Max Welling is a professor in machine learning at the University of Amsterdam, a co-founder and board member of Ellis and the director of the Amsterdam Ellis unit. Credit: Bob Bronshoff

Within the Netherlands, Ellis collaborates with the Dutch AI Coalition and Claire. Claire originated from an EU request. The European Committee expressed its willingness to invest in AI but stated it couldn't communicate with hundreds of separate

research groups all across the continent. The field needed to organize itself and come up with one organization to talk to. “That’s how Claire came to be,” explains Van Harmelen, who’s one of the initiative’s Dutch intermediaries.

“Generally, the next steps are expected to result from combining reasoning and learning, combining older techniques with technology developed during the last ten years,” Van Harmelen continues. This calls for a broadly oriented network with expertise from different angles in AI. “That’s the goal of Claire.”

Claire

The Confederation of Laboratories for Artificial Intelligence Research in Europe (Claire) has quite some similarities to Ellis. They’re both research networks and communicate with the European government. Claire consists of 350 research groups in 34 countries and, thus, doesn’t limit itself to EU member states. The Netherlands is strongly represented, with national intermediaries Frank van Harmelen from UvA and Jeroen van den Hoven from Delft University of Technology. Holger Hoos from Leiden University is one of the driving forces at the European level.

Last December, Claire [opened its European headquarters in The Hague](#). “The Netherlands traditionally has a strong position in the research field of AI,” tells Van Harmelen. “Large investments are needed if we want to maintain that position. In that light, The Hague is a logical choice.”

The lack of investments inspired another initiative in the Netherlands, which doesn’t mediate between research and politics: ICAI (see box). Together with colleagues from UvA and VU, De Rijke started it about two years ago because they saw the

strategic role AI would play in society and felt something needed to happen. “If the Netherlands wants to remain in strategic control, we need to have the talent and the capacity to understand, design and develop that technology ourselves. To achieve this, we organized several labs under the ICAI umbrella. We don’t have any funding to offer, but we do share experiences, a vision on how collaborative research can be conducted between academia and industry and we connect different parties. Don’t wait, but act. That gives a strong sense of ownership.” Next to being the ICAI director, De Rijke is also in charge of one of the research labs and involved in two others.

ICAI

The Innovation Center for AI (ICAI) is a network of research labs. Each lab is a five-year collaboration between one or more knowledge institutions and companies. It needs to have at least five PhD candidates, amounting to an investment of about 2 million euros. Right now, ICAI has 11 labs, with about one hundred researchers, in Amsterdam, Delft, Utrecht, Nijmegen and soon in Tilburg, Maastricht and Eindhoven. The target is to have 20 labs by the end of 2020.

Reap and regulate

Especially ICAI demonstrates that research institutes and companies can easily find each other and push forward. The government, however, remains absent. Since 2016, many countries worldwide have presented AI strategies on how to invest. “The Netherlands now finally has presented an AI vision, but, unfortunately, still hasn’t invested at all,” laments De Rijke.

“You would hope to create more speed at the national level,”

states Van Harmelen. Welling agrees: “I hope for some movement within the Netherlands. We’ve been founding initiatives, but we really need to invest in the technology and the people that have the knowledge. Not only to reap the economic and societal rewards but also to regulate how we want to shape our society.”

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