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# Benelux AI Newsletter

Would you like to announce your own events on the BNVKI website and newsletter? Send an email to events@bnvki.org! Also reports of past events are welcome. If you have other news or contributions for the BNVKI newsletter, these can be sent to editor@bnvki.org.

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## AI Synergies - Conference Report of BNAIC/Benelearn 2019

*-- By Daphne Lenders, Turning Magazine*

“United in Diversity”. According to Holger Hoos, professor at the University of Leiden, this is not only the motto of the European union but can also serve as a guideline for the development of AI. That it’s actually possible to turn this statement to reality was demonstrated during this year’s AI synergies conference. From the 6th to 8th of November, AI- and ML-researchers from Benelux gathered in Brussel to present and share the latest developments in the ever-changing field.

A quick look in the program of the conference already shows that ‘diversity’ was more than just an empty promise. For the first time ever, the conference had dedicated tracks for business and academics, showing that AI will strive more if knowledge between both is shared. Like in the previous year, AI synergies was also a combined conference of
ML-focussed *BeNeLearn* and the broader AI conference *BNAIC*. As a result the conference covered topics to everyone’s heart’s desire: from Knowledge Representation to Deep Learning, from Robotics to Creative AI or Natural Language Processing. Read more about the conference highlights here!

**Machine Learning/Deep Learning:**

Talking nowadays about AI, there's no way to avoid the topic of Machine Learning. After all, many of the recent advances are made in this field and challenges like Computer Vision are successfully being tackled through Machine Learning. There were multiple sessions covering research related to this field during AI synergies. With dedicated tracks for "ML for Bioinformatics & Life Science", "AI for Health and Medicine" and "Applied ML & ML for Medicine", many talks were about deploying Machine Learning for the highly societal relevant area of healthcare. The talks about using algorithms for HIV-, breast- or skin-cancer-, or sepsis detection highlighted AI's promising potential for diagnosis .

**Explainable AI:**

Closely connected to the field of Machine Learning, but still worthy of its own track was the Explainability session during AI synergies. Following the Peter-Parker principle of "with great power comes great responsibility", researchers have recognized that in order for AI to be more trustworthy it needs to be more understandable. Many talks were dedicated on how to make AI more transparent, demonstrated in the field of robotics or on the example of convolutional networks.

Moreover, a key-note talk was dedicated to this particular topic. In the presentation *"Explainable AI: explain what to whom"* Silja Renooij warned about just using white-box models like Bayesian Networks as a sufficient explanation to AI systems. Not everyone has the necessary background knowledge to actually understand the difference between correlation and implied causation, so we should be careful to just assume that Bayesian Networks are inherently understandable. She therefore argued that provided explanations should be adjusted to users' understanding of AI/statistics in general.

**Agents, Multi-Agent Systems and Robotics:**

Next to a number of research-talks about agents- and multi-agent systems, AI synergies included a key-note about this topic, given by Jeremy Pitt. In "Democracy by Design" he describes how a simulated civilisation can generate new rules to reduce risks of tyranny or autocracy when being implemented on the principles of Ober's basic democracy.

Focussing more generally on robotics, another key-note was given by Ana Paiva. Predicting that more and more robots will be integrated in our society, she argued that we should strive for a harmonic collaboration between humans and machines. Presenting a case-study of robots teaming up with humans to play a card game, she

showed what factors need to be considered when designing and evaluating  Human-Robot-Interactions.

**Knowledge Representation:**

One of the oldest and most traditional approaches to AI is the field of Knowledge Representation. While currently much more attention is put on more modern techniques, Marie-Christine Rousset demonstrated in her key-note talk “Reasoning on Data: Challenges and Applications” how modern challenges regarding data quality (like e.g. data inconsistency) can be tackled by deploying first- or second order logic rules.

In the track “Knowledge Representation & Hybrid”, multiple speakers elaborated on this idea, showing e.g. how the improvement of Knowledge Representation languages open up new possibilities for combination between old and new Data Science approaches.

Of course this overview by far is not enough to cover all the diverse and engaging talks given during the conference. Therefore, make sure to check out the conference (pre)proceedings for a detailed overview of all research topics. One last thing that might be noticed there, is how student-friendly the AI synergies conference is. Not only Master, but even Bachelor students admitted their abstracts and got accepted to present at the conference.
So can AI be truly “United in Diversity”? Looking at the varying expertise-levels of the speakers, the range of topics covered by the conference, and the combination of business and research, AI-synergies shows that this mission can indeed be fulfilled.

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# The 2019 SKBS Prize

The Foundation for Knowledge Based Systems (SKBS) continued their policy of awarding the SKBS prize to the best demonstration of the Demo-session of the BNAIC 2019.

The 2019 referee committee consisted of Arnoud Visser (UvA), Bart Verheij (University of Groningen), Celine Vens (KU Leuven-campus Kortrijk), Robin Manhaeve (KU Leuven), Guillaume Derval (UC Louvain).

The referee committee had to consider ten submissions which were eligible for the SKBS prize. In Table 1 we list them by topic (in the order of their publication in the

Conference Program BNAIC 2019).

Denis Steckelmacher, Hélène Plisnier and Ann Nowé
*A Motorized Wheelchair that Learns to Make its Way through a Crowd*

Youri Coppens, Eugenio Bargiacchi and Ann Nowé
*A Virtual Maze Game to Explain Reinforcement Learning*

Pierre Carbonnelle, Bram Aerts, Marjolein Deryck, Joost Vennekens and Marc Denecker
*An Interactive Consultant*

Tom Vander Aa, Tom Ashby and Roel Wuyts
*Virtual Screening on FPGA*

Willem Röpke, Roxana Radulescu, Kyriakos Efthymiadis and Ann Nowe
*DuStt - a Speech-to-Text Engine for Dutch*

Habib-Ur-Rehman Khalid, Sofie Pollin, Thomas Gielen, Hans Cappelle, Miguel Glassee, Andre Bourdoux and Hichem Sahli
*Gesture Recognition with an FMCW Radar*

Jessica Coto Palacio, Yailen Martínez Jiménez and Ann Nowe
*Multi-Agent Reinforcement Learning Tool for Job Shop Scheduling Problems*

Jens Nevens, Paul Van Eecke and Katrien Beuls
*Interactive Learning of Grounded Concepts*

Selma Yilmazyildiz Kayaarma, Sherik Lehal and Hichem Sahli
*Politeness Detection in Speech for Human-Computer Interaction*

Jens Claes, Bart Bogaerts, Rocsildes Canoy, Emilio Gamba and Tias Guns
*ZebraTutor: Explaining How to Solve Logic Grid Puzzles (Demo)*

**Table 1:** The 2019 candidates of the SKBS prize.

In 2019, ten submissions were exhibited in the “Halle aux Fûts” (Ateliers des Tanneurs) for the SKBS prize. All demos were of a high quality, but varying in type, ranging from educational demonstrations that were aimed at explaining AI techniques to the general public, through hardware-oriented demonstrations, to AI research demonstrations covering a multitude of AI methodologies and techniques. The jury (referee committee)

was given the task to take the following items into consideration by scoring them between 1 and 5: (a) relation to AI, (b) originality, (c) applicability (or is it already a (full-fledged) application?), (d) does it contribute to the further development of AI?, (e) the generalisability to other AI applications/domains, and (f) the contribution to Society (Valorisation).

All in all, the referee committee had a difficult task. There were three demonstrations that stood out for the five jury members. We then calculated the average scores they gave to all demonstrations, and indeed the same three demonstrations made up the top 3 in the overall ranking. The final scores were very close to each other.

The first prize was assigned to Dennis Steckelmacher, Hélène Plisnier and Ann Nowé for the demo *A Motorized Wheelchair that Learns to Make its Way through a Crowd*.

The prize is €500,- and has been awarded to the Reinforcement Learning team of the AI Lab of the Vrije Universiteit Brussel.

In Table 2 we provide an overview of the winners of the SKBS prize so far.

**1999 Maastricht**

M. van Wezel, J. Sprenger, R. van Stee, and H. La Poutré

*Neural Vision 2.0 – Exploratory Data Analysis with Neural Networks*

**2000 Kaatsheuvel (shared prize)**

E. Zopfi

*HKT*

G. Schram

*LubeSelect*

**2001 Amsterdam**

Alexander Ypma, Rob Kleiman, Jan Valk, and Bob Duin

*MINISOM – A System for Machine Health Monitoring with Neural Networks*

**2002 Leuven**

F. Brazier, D. Mobach, and B. Overeinder

*AgentScape Demonstration*

**2003 Nijmegen**

Bert Kappen, Wim Wiegerinck, Ender Akay, Marcel Nijman, Jan Neijt, and André van Beek

*Promedas: A Diagnostic Decision Support System*

**2004 Groningen**

Wouter Teepe

*The Secret Prover: Proving Possession of Arbitrary Files While not Giving Them Away*

**2005 Brussels**

Gerald de Jong

*Fluidiom: The Evolution of Locomotion*

**2006 Namur**

Marion Verduijn, Niels Peek, Peter Rosseel, Evert de Jonge, and Bas de Mol

*Procarsur: A System for Prognostic Reasoning in Cardiac Surgery*

**2007 Utrecht**

Tim Harbers, Rob van der Veen, Marten den Uyl

*Sentient Demonstration BNAIC 07: Vicavision*

**2008 Enschede (shared prize)**

Joris Maervoet, Patrick De Causmaecker, and Greet Vanden Berghe

*A Generic Rule Miner for Geographic Data*

and

Dennis Reidsma and Anton Nijholt

*Temporal Interaction between an Artificial Orchestra Conductor and Human Musicians*

**2009 Eindhoven**

Tom van Bergen, Maarten Brugmans, Bart Dohmen and Niels Molenaar

*Cobes: The clean, safe and hospitable metro*

**2010 Luxembourg**

*Willem Burgers, Wim Wiegerinck, and Bert Kappen*

*Disaster Victim Identification System*

**2011 Ghent**

*Wim Vancroonenburg, Jannes Verstichel, Greet Vanden Berghe, and Wouter Souffriau*

*Efficient aircraft loading: a mixed integer programming approach for the aircraft weight and balance problem*

**2012 Maastricht**

Michel Klein, Nataliya Mogles, and Arlette van Wissen

*Demonstration of eMate – Stimulating Behaviour Change via Mobile Phone*

**2013 Delft**

Sjriek Alers, Daniel Claes, Joscha Fossel, Daniel Hennes, and Karl Tuyls

*Applied Robotics: Precision Placement in RoboCup@Work*

**2014 Nijmegen**

Steffen Michels, Marina Velikova, Bas Huijbrechts, Peter Novak, Jesper Hoeksma, Roeland Scheepens, Jan Laarhuis, and André Bonhof

*Enhancing Operational Work in Maritime Safety-and-Security Tasks.*

**2015 Hasselt**

Wiebe van Ranst and Joost Vennekes

*Ultra-low-latency Endoscopic Image Stabilisation*

**2016 Amsterdam**

Caitlin Lagrand, Patrick M. de Kok, Sébastien Negrijn, Michiel van der Meer and Arnoud Visser

*Autonomous robot soccer matches*

**2017 Groningen**
Dennis Steckelmacher, Hélène Plisnier, Diederik M. Roijers and Ann Nowé
*Hierarchical Reinforcement Learning for a Robotic Partially Observable Task*

**Table 2:** Overview of SKBS prizes.

Read more

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# Turning: a new AI magazine for students

Just like the field of AI experienced the AI winter, “De Connectie” stopped publishing for around 4 years. Until 2015 “De Connectie” reported regularly about the latest projects of AI by giving researchers and students across the Netherlands the opportunity to write about their projects.
Much has happened in the field of AI, and as of September, “De Connectie” will be back to report about it with in a new edition, with a new look and a new name: Turning.

But not everything has changed. Turning will continue to publish every edition with a theme topic, starting with “AI and Arts”. This first issue connects to the spirit of previous editions and includes articles from students and researchers from Nijmegen, Tilburg and Enschede. The board, a group of students from the Radboud University Nijmegen,

hopes to expand their network to include articles written by AI enthusiasts and experts across the Netherlands and beyond.

Targeted mainly towards students in the field of AI, the general aim is to be understandable to everyone with interest in the field and close the gap between the general interest and research in AI.

Turning will be published twice a year, starting this September. A yearly subscription costs 5 € (excluding delivery), please contact info@turningmagazine.com.

Further information as well as sneak peaks about the first articles can be found at https://www.turningmagazine.com/.

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# AI Interactive Workshop at VU

The AI Interactive Workshop was held at the Vrije Universiteit (November 20-22). It focused on similarities and differences between Machine Learning, AI, Data Science, and Complex Systems. It was organized by Jelena Grujić and Hannah Pinson, Artificial Intelligence Lab, Vrije Universiteit Brussel, Belgium.

Further information:
https://ai.vub.ac.be/events-calendar/interactive-workshop/.

Read more

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# Kick-off Hybrid Intelligence project

The Hybrid Intelligence project had its kick-off meeting on December 2. It is a Dutch NWO funded Gravitation/Zwaartekracht project (10 years, 20 million euros, 6 universities). The project studies Hybrid Intelligence (HI), the combination of human and machine intelligence, expanding human intellect instead of replacing it. In four research lines, collaborative HI, adaptive HI, responsible HI and explainable HI are studied. Participating universities are in Amsterdam (VU & UvA), Delft, Groningen, Leiden and Utrecht. The project has its headquarters in a new building on the VU campus, Amsterdam.

Further information: https://www.hybrid-intelligence-centre.nl/.

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# Conference " The Humanities and the Rise of AI " (University of Luxembourg)

The university of Luxembourg organises the conference "The Humanities and the Rise of AI", 14-18 June 2020. More information on the conference website.

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# International Conferences on Logic and Artificial Intelligence at Zhejiang University (ZJULogAI)

The International Conferences on Logic and Artificial Intelligence at Zhejiang University (ZJULogAI) are organized by the Zhejiang University – University of Luxembourg Joint Laboratory on AIs, Robotics and Reasoning (ZLAIRE).

With their special focus theme on **Explainable AI**, the conferences intend to promote the interplay between logical approaches and machine learning based approaches in order to make AI more transparent and accountable.

ZJULogAI will take place at the Zijingang Campus of Zhejiang University on April 6–9, 2020.

ZJULogAI is co-financed by the University of Luxembourg.

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# Strategic Action Plan for Artificial Intelligence (SAPAI)

On October 8th, 2019, the Dutch government has launched a Strategic Action Plan for Artificial Intelligence, outlining goals and actions for the country to take advantage of the social and economic opportunities offered by artificial intelligence (AI). The document is available via: https://www.rijksoverheid.nl/ministeries/ministerie-van-economische-zaken-en-klimaat/documenten/beleidsnotas/2019/10/08/strategisch-actieplan-voor-artificiele-intelligentie.

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# AI Research Agenda for the Netherlands

Recently, NWO has released the AI Research Agenda for the Netherlands (AIREA-NL). The document is available via: https://www.nwo.nl/actueel/nieuws/2019/11/eerste-nationale-onderzoeksagenda-voor-artificiele-intelligentie.html.

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# Positions for professors at Maastricht University

DKE at Maastricht University is opening a number of positions.  For all information, see the links below.

All positions:
www.maastrichtuniversity.nl/work-at-dke
Full professor in Intelligent Interaction
https://www.academictransfer.com/en/287752/full-professor-in-intelligent-interaction/

Full professor in Explainable Artificial Intelligence
https://www.academictransfer.com/en/287753/full-professor-in-explainable-artificial-intelligence/

Lecturers (two, with a background in Computer Science/Engineering/Applied Mathematics)
https://www.academictransfer.com/en/287746/lecturers-10-fte-with-a-background-in-

computer-science-mathematics-or-engineering/

Assistant professor in Machine Learning
https://www.academictransfer.com/en/287076/assistant-professor-in-machine-learning-tenure-track/

Assistant professor in Optimization
https://www.academictransfer.com/en/287137/assistant-professor-in-optimization-tenure-track/

Soon opening: Associate professor in Data Fusion and Integration
*"The focus of this position is on generating high-quality added value from data by developing methods and techniques for: (1) integrating a multitude of different data sources, (2) bringing together widely heterogeneous data sources, and (3) analyzing data with complex and non-standard structures. In current application domains in science and society, there is a strong incentive to develop such methods. This holds for applications ranging from AI techniques in robotics (e.g. self-driving cars, cooperative autonomous agents) to modern medicine (e.g. personalized medicine) and physics (e.g. the combination of noisy data from different devices and detectors, to facilitate detection of events from weak signals)."*

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# Opening Radboud AI for Health Lab

On September 16th, 2019, the official opening event of the Thira Lab and Radboud AI for Health Lab look place in the Tuinzaal of Radboudumc. For over 150 attendees, Radboudumc's Chair of the Executive Board prof. Paul Smits opened the first two Nijmegen-based labs within the nationwide Innovation Center of Artificial Intelligence (ICAI).

Radboud AI for Health Lab is a new collaboration between Radboud University and Radboudumc, and is part of Radboud AI, a campus-wide initiative to improve collaboration and start new projects with AI researchers in Nijmegen. Radboud AI for Health has awarded 6 Ph.D. positions, aimed to bring a variety of AI solutions to the clinic. Radboud AI for Health, located in the Radboudumc Innovation Space, will also house BSc and MSc students who perform AI research projects in collaboration with Radboudumc clinicians. Finally, the Lab offers courses to Radboudumc employees who would like to learn more about the application of AI in healthcare.


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# New Eindhoven Artificial Intelligence Systems Institute

TU/e officially launched the new knowledge institute EAISI (Eindhoven Artificial Intelligence Systems Institute)
during the Opening of the Academic Year on SEPTEMBER 2, 2019.

The Eindhoven Artificial Intelligence Systems Institute (EAISI, say: ‘easy’)  is meant to meet the rapidly increasing demand for courses, engineers and know-how in the field of AI. The new institute will focus on the use of smart algorithms in machines, like robots and autonomous cars, traditionally a strong point of the TU/e. In total, the university will spend some 100 million euros over a five-year period. Additionally, it will take on fifty extra professors for education and research in AI.

For more information, see https://www.tue.nl/en/news/news-overview/ai-takes-central-stage-at-opening-academic-year/ and https://www.tue.nl/en/research/research-areas/artificial-intelligence/

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