Benelux A.I. Newsletter

A New RoboCup@Home Challenge

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Contents

A New RoboCup@Home Challenge

by Arnoud Visser, University of Amsterdam

Abstract

The RoboCup@Home is an initiative to test if robots could be useful in the challenging environment of your home. This means that the robots have to be able to navigate through a cluttered environment and in addition also have to interact with your family. To do that, the robot should understand which objects could are present in your home, find them and manipulate them. Quite a challenge, where the RoboCup community works on since 2005 (and should be finished in 2050). To accelerate the developments in the league, it could be very beneficial to exchange algorithms and software based on a Standard Platform, as demonstrated in other RoboCup leagues. This year the RoboCup@Home will be extended with a Standard Platform competition, with its own Social Challenge.

Introduction

The RoboCup@Home was initiated in 2005 [1] by a Dutch RoboCup Trustee. The idea was that such competition was closely related to artificial intelligence [2], because for the social interaction the robot needs cognitive awareness of the natural surroundings of humans. Since its initiation, the RoboCup@Home competition has grown into the largest yearly competition for domestic service robots [3]. Several Dutch teams[1] have been active in this league [4, 5, 6]. Note that the Dutch are also active in several other leagues, that Belgium has been active in the RoboCup Junior and that Luxembourg initiated recently a Standard Platform soccer team[2].

The idea behind the RoboCup@Home is to have a fixed number of domestic tasks that have to be executed by the robots, but that the circumstances under which those tasks have to be performed get more challenging / realistic every year. Examples of such domestic tasks are e.g. that the robot follows a person over the venue guided by voice and gesture commands or that the robot retrieves certain objects from a shelf. To be able to perform such tasks, the robot needs on advanced physical and sensory capabilities, to be able to manipulate [7] and navigate [8] in these surroundings. On this basis one could further develop situation awareness, learning of appropriate responses, understanding the relation between spoken requests and objects in the surroundings and recognizing human emotions and intentions [9].

With every team building their modules on top of their own robotic platform, it is difficult to exchange modules as easily as when a standard platform is used [10]. To promote such synergy, the RoboCup@Home competition is extended with two Standard Platform Leagues. The first is the Domestic Standard Platform League (DSPL), which has as main goal to assist humans in a domestic environment, paying special attention to elderly people and people suffering of illness or disability. To accomplish this, the teams in this competition will focus on Computer Vision, Object Manipulation and Safe Navigation. The second is the Social Standard Platform League (SSPL), where the robot is the one who will actively look for interaction. Hence, this league focuses on Human-Robot Interaction, Natural Language Processing, People Detection and Recognition, and Reactive Behaviors.

Social Standard Platform League

The robot to be used for the SSPL will be the human-shaped Pepper robot from Softbank Robotics. The first task given to this robot is to be a waiter on a cocktail party (see Figure 1).

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[1] See for an overview `http://www.robocup.nl/teams.html`
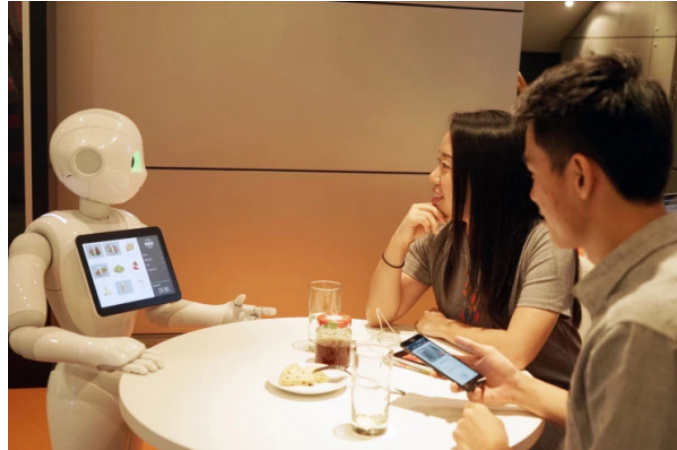[2] Luxembourg United founded by Patrice Caire

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Figure 1: A Pepper robot servicing in a restaurant setting.

The full scenario for the Pepper robots task at the cocktail party is as follows:

1. **Entering:** The robot enters the arena and navigates to the party room and waits for being called.

2. **Getting called:** The guests call the robot simultaneously, either rising an arm, waving, or shouting. The robot has to approach one of them. The calling person introduces themself by name before giving the order of a drink. The robot leads the dialogue to learn the person and retrieve their drink order.

3. **Placing the orders:** The robot has to navigate to the *Bar*, a designated location in another room where drinks are served. The robot must repeat each order to the *Barman*, clearly stating:

   (a) The person's name,

   (b) The person's chosen drink,

   (c) A description of unique characteristics of that person that allow the *Barman* to find them (e.g. gender, hair colour, how is dressed, etc).

   While the robot places the orders, the people in the "party room" may change their places within the party room (on request of the referees).

4. **Missing beverage:** One of the ordered drinks is not available, therefore, missing from the bar. The robot should realize this inconvenience and tell the *Barman*, providing a list of 3 alternatives considering the other drinks it needs to deliver. If the robot can't detect which drink is missing, the *Barman* will clearly state which of the beverages is not available and provide a list of 3 alternatives.

5. **Correcting an order:** The robot should navigate back to the "party room", find the person whose drink is missing and provide the alternatives to choose from.

As can be seen from this scenario, the test focuses on the robot capabilities in human detection and recognition, safe navigation and human-robot interaction with unknown people.

UvA@Home

The Universiteit van Amsterdam (UvA) has been selected to buy a Pepper robot under the special conditions of Softbank Robotics for RoboCup teams[3]. The UvA@Home has submitted a team description paper and qualification video[4], to be one of the 12 teams world-wide that will be selected to participate in the Social Standard Platform League. In their team description paper [11] they indicate how they will perform the face recognition, natural language processing, object recognition, object manipulation and navigation. Their software is published in a public repository[5].

Conclusion

The Social Standard Platform League imposed a new challenge inside the RoboCup @Home competition. Progress in this league will be directly applicable to social relevant scenarios and can directly be disseminated to interested companies and the community.

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[4] https://www.youtube.com/watch?v=-i8xgfzAFoQ
[5] https://github.com/SpinazieSin/UvA-Home

[9] L. Iocchi, D. Holz, J. Ruiz-del Solar, K. Sugiura, and T. van der Zant. RoboCup@Home: Analysis and results of evolving competitions for domestic and service robots. *Artificial Intelligence*, 229:258–281, 2015.

[10] Shivaram Kalyanakrishnan, Todd Hester, Michael Quinlan, Yinon Bentor, and Peter Stone. Three humanoid soccer platforms: Comparison and synthesis. In *Robot Soccer World Cup*, pages 140–152. Springer, 2009.

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Report of BNAIC 2016

On November 10-11, the 28th edition of the Benelux Conference on Artificial Intelligence (BNAIC 2016) took place in Hotel Casa 400 in Amsterdam. The conference was jointly organized by the University of Amsterdam and the Vrije Universiteit Amsterdam, under the auspices of the Benelux Association for Artificial Intelligence (BNVKI) and the Dutch Research School for Information and Knowledge Systems (SIKS).

The objective of BNAIC is to promote and disseminate recent research developments in Artificial Intelligence, particularly within Belgium, Luxembourg and the Netherlands. As in previous years, BNAIC 2016 welcomed four types of contributions, namely A) regular papers, B) compressed contributions, C) demonstration abstracts, and D) thesis abstracts.

We received 93 submissions, consisting of 24 regular papers, 47 compressed contributions, 11 demonstration abstracts and 11 thesis abstracts. After thorough review by the Program Committee, the conference chairs made the final acceptance decisions. The overall acceptance rate was 88% (63% for regular papers, 100% for compressed contributions and demonstration abstracts, and 91% for thesis abstracts).

The program of BNAIC 2016 turned out very exciting and diverse: in addition to the regular research presentations, posters and demonstrations, it included several other elements, among which (i) keynote presentations by Marc Cavazza (University of Kent), Frank van Harmelen (Vrije Universiteit Amsterdam), Hado van Hasselt (Google DeepMind), and Manuela Veloso (Carnegie Mellon University), (ii) a Research meets Business session, a panel discussion on Social Robots, with contributions by Elly Konijn (Vrije Universiteit Amsterdam), Ben Kröse (University of Amsterdam & Amsterdam University of Applied Sciences), Mark Neerincx (TNO & Delft University of Technology), and Peter Novitzky (University of Twente), (iii) a special FACt (FACulty focusing on the FACts of AI) session with presentations by Bart de Boer (Vrije Universiteit Brussels), Catholijn Jonker (Delft University of Technology), and Leon van der Torre (University of Luxembourg), and (iv) a special session on open access publishing with contributions by Rinke Hoekstra (Vrije Universiteit Amsterdam), Maarten Frohlich (IOS Press), Bernard Aleva (Elsevier), and Hilde van Wijngaarden (University of Amsterdam/Amsterdam University of Applied Sciences).

BNAIC 2016 featured three awards:

- The SNN Best Paper Award was awarded to Rik van Noord, Florian Kunneman and Antal van den Bosch for their contribution 'Predicting civil unrest by categorizing Dutch Twitter events'.

- The SKBS Best Demo Award was awarded to Caitlin Lagrand, Patrick M. de Kok, Sébastien Negrijn, Michiel van der Meer and Arnoud Visser for their contribution 'Autonomous robot soccer matches'.

- 'The Best Thesis Abstract Award was awarded to Hossam Mossalam for his contribution 'Multi-Objective Deep Reinforcement Learning with Optimistic Linear Support'.

The conference attracted a record number of 150 visitors from academia, industry and society. BNAIC 2016 was chaired by Bert Bredeweg and Tibor Bosse, and co-organized with the help of Mark Hoogendoorn, Tom Kenter, Mojca Lovrencak, Adnan Manzoor, Arnoud Visser, and Natalie van der Wal. Below, a selection of brief reports of the regular sessions is included.

Session 2 - Natural language

Chair: Tom Kenter

The three papers in the NLP session highlighted different aspects of modern natural language processing. The papers, 'Textual Inference with Tree-structured LSTMs', by Kolawole J. Adebayo, Luigi Di Caro, Livio Robaldo, and Guido Boella, 2016 and 'Using Distributed Representations to Disambiguate Biomedical and Clinical Concepts', by Stéphan Tulkens, Simon Suster, and Walter Daelemans, 2016, made use of recent advances in neural network technology and deep learning. The former employed Child-Sum Tree-LSTMs, that made use of dependency parse trees of sentences, in a textual entailment task. The latter was about word sense disambiguation in medical texts, and used word embeddings, as trained by word2vec, combined with definitions in a domain-specific knowledge base. Also in the medical domain, 'Utilizing uncoded consultation notes from electronic medical records for predictive modeling of colorectal cancer', by Mark Hoogendoorn, Peter Szolovits, Leon M.G. Moons, Mattijs E. Numan, 2016, applied NLP-based features to generate features for a logistic regression classifier to aid prediction of colorectal cancer from electronic medical records.

Session 3 - Machine Learning (Deep)

Chair: Kurt Driessens

The first machine learning session, more specifically on Deep Learning techniques and applications, included one presentation on a paper accepted in the Machine Learning Journal and two presentations of master thesis research work. Decebal Mocanu presented the journal paper titled "A topological insight into restricted Boltzmann machines" in which he and his co-authors investigate the use of small world and scale free network topologies to replace the standard bi-partite fully connected networks used in RBMs to speed up training without a noticeable loss in performance. Hossam Mossalam gave a talk titled "Multi-Objective Deep Reinforcement Learning with Optimistic Linear Support" in which he reported on the use of deep learning for multi-objective reinforcement learning problems in the form of a Deep Q-Network that learns the Q-functions of a convex coverage set sequentially by adjusting only part of the deep network for every sequentially chosen reward scalarisation function. In her talk "Deep Reinforcement Learning for Coordination in Traffic Light Control", Elise van der Pol presented her master thesis work that dealt with combining Deep Q-Networks with a multi agent reinforcement learning problem, namely traffic light control. She showed that DQN's can be used to learn a reasonable local traffic-light strategy and can be combined with a max-plus coordination set-up, but that problems might arise due to stability issues.

Session 4 - Agents (argumentation)

Chair: Johan Kwisthout

Due to illness of one of the speakers, only two of the three scheduled presentations were delivered. Henry Prakken introduced the work with his student Diana Grooters on argumentation theory, in particular their solution to the 'ex falso' principle. Henry showed that from two contradictory defeasible arguments logically anything can be derived, including an attack on any other argument that was derived independently. This is a longstanding issue in argumentation theory that has been addressed previously in the literature, but not to full satisfaction. Henry illustrated an alternative solution, that was recently published in the Journal of AI Research, that circumvents the earlier problems. Tom Lenaerts presented work with Luis Martinez-Vaquero, The Anh Han, and Luis Moniz Pereira. In his presentation, he introduced the concepts of 'apology' and 'forgiveness' in the iterated prisoner's dilemma game. Their research,

previously published in Scientific Reports, confirms in a game theoretic setting the intuition that both concepts are useful mechanisms to maintain mutually beneficial relationships. As long as an apology is 'costly enough' (think of a box of chocolates or an offer to do extra homework chores), forgiving the uncooperative behaviour is more efficient than 'taking revenge' by defecting in maintaining a stable relationship - a reassuring thought in modern society!

Session 5 - Search

Chair: Jaap van den Herik

This paper session on search had three fascinating speakers who showed that searching for a solution can be very rewarding. All three speakers were senior researchers who were able to communicate their message convincingly to the public.

Mark Winands did so for the paper 'Enhancements for Real-Time Monte-Carlo Tree Search in General Video Game Playing', by Dennis Soemers, Chiara Sironi, Torsten Schuster, and Mark Winands. He started describing the new domain General Game Playing and then gave a brief overview of the development. Important milestones are the development of Game Description Languages (GDL, 2005), Arcade Learning Environment (2012), General Video Game AI (2014), and the real-time learning track (2015) as well as the two-player real-time learning track (2016). Mark focussed on the single-player track and discussed to a large extent enhancements of MCTS. Well done! Jos Uiterwijk was the representative lecturer of the paper 'Combining Combinatorial Game Theory with an Alpha-Beta Solver for Clobber' (together with Janis Griebel). He gave a brief and interesting introduction to Clobber, mathematical games, representations, and filling databases. Moreover, he showed a collection of problems in 5x1, 4x2, 3x3, 2x4, and 1x5 games. Thereafter he convinced the audience that the system possessed sufficient knowledge for solving the 3x6 games. The new techniques guaranteed the team a reduction of 75% for Clobber and 80% for Domineering. In summary, Combinatorial Game Theory is very powerful in combination with $\alpha - \beta$ search.

Closely related was the topic of the third presentation by Bert Kappen on 'Adaptive Importance Sampling for Control and Inference' (together with Hans Ruiz). The point of departure was the Bellman equation. In general, solving this equation for high dimensional systems is difficult. Stochastic Optimal Control (SOC) theory focusses on finding an optimal sequence of actions to obtain a future goal. With the help of Path Integrals (PI theory) the problem is nowadays reformulated as a problem where efficient importance samples play a crucial role. The adequate representation of such controllers is based on the cross-entropy method. So, the Path Integral Cross Entropy (PICE) method was developed. A series of well-chosen problems and their solutions was presented to show the audience their effectiveness. All in all, a pleasant and convincing presentation. The session as a whole was considered very attractive by the participants.

Session 8 - Agents (adaptation)

Chair: Mark Hoogendoorn

The session on adaptation among agents was a very lively session with a lot of interesting discussions. It started with a presentation given by Armon Toubman on the adaptation of agents that take up the role of virtual opponents for fighter pilots in training situations. Armon explained a novel technique to adapt the behaviour to strategies deployed by human trainees using finite state machines to represent the behaviour of the agent. Next, Gleb Polevoy gave a talk focussing on interactions between humans and agents as well. The talk considered reciprocal habits people have in responding to the actions performed

by others. He introduced an approach to determine whether it is advisable to use these habits or not (in terms of utility) for a specific game setting. Sophie Van der Woerdt took a more psychological perspective in her presentation. She studied the extent to which people would attribute agency to a robot in the case it would fail to perform a certain task. From her experiments, she concluded that the attribution of agency to robots that fail due to a lack of effort (as opposed to a lack of ability) is significantly increased. The presentation given by Harmen de Weerd touches upon another psychological concept: theory of mind. Using empirical data from two experiments in which humans played a simple repeated game he identified the most common theory of mind strategies used by the human players. This was done using a Bayesian approach. Results show that relatively low order theory of mind models are being used in the repetitive games, or even no theory of mind.

Vincent Koeman gave the final presentation addressing the issue of failure detection in cognitive agent programs. Debugging traditional program languages has been extensively studied, e.g. using unit testing. However, for cognitive agent debugging programs is still notoriously difficult. The automated test framework presented is able to assist a programmer to test the code and find errors. The approach has been shown to detect (known) errors in programs handed in by students better than the currently available approaches.

Session 10 - Knowledge representation

Chair: Joost Vennekens

The session on Knowledge Representation had three presentations. First, Wouter Beek presented work on the meaning of equality in the context of semantic web reasoning. He used a number of convincing examples to demonstrate that the notion of equality can be highly context-dependent: for instance, from a pharmaceutical point of view, it can be highly desirable to consider drugs sold by two different companies as 'the same' if they have the same chemical composition, while this may not be what is desired for e-commerce, when both drugs are priced differently. Existing proposals to solve these problems may lead to various complications, such as the question whether bbc:sameAs is bbc:sameAs owl:sameAs.

The second presentation was given by Giovanni Casini, who presented an approach for recovering from incoherence in the context of description logics. When different knowledge bases are combined, several problems may arise. One of these is that concepts may become unsatisfiable (i.e., no objects can belong to the concept), which is often not intended. Giovanni presented a method for recovering from this phenomenon, by making axioms defeasible until coherence is regained.

The third presentation was given by Veruska Zamborlini. She presented work in the medical domain. The goal of the work is to identify interactions between different regulations and guidelines. Veruska's presentation was followed by a lively discussion, which stressed the importance of taking not only the presence of an effect into account but also its size. There was a general consensus that it is difficult to find examples that are both accessible to computer scientists and meaningful to medical experts.

Session 12 - Optimisation

Chair: Joost Vennekens

Due to illness, this session was chaired by Joost Vennekens instead of John-Jules Meyer, as originally planned. The speakers were apparently also not immune, because none of the authors of the second paper in this session could be present. Luckily, a PhD-student of one of the authors had been found willing to

give the presentation. Despite the inherent difficulty of presenting other people's work, he did a great job of explaining the paper, which was about scheduling for transport by trucks. The special feature of the problem addressed in this paper was that the trucks belong to different companies, each of which must be treated fairly, i.e., assigned an appropriate number of tasks.

The first presentation in this session was given by Georgios Methenitis. His work was on the topic of smart grids. He proposed a game-theoretic model for looking at how consumers and distributors of electricity interact with each other. In his model, uncertainty about future supply and demand plays an important role.

The 2016 SKBS Prize

by Jaap van den Herik, Director of SKBS

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 2016.

The 2016 referee committee consisted of Jaap van den Herik (chair), Nathalie van der Wal (VU Amsterdam), Tom Kenter (UvA), Bart Verheij (RUG), Jan Scholtes (Zylab), and Tijn van der Zant (Robolect).

The referee committee had to consider eleven 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 2016) see `https://staff.science.uva.nl/b.bredeweg/BNAICprogramma20161106FinalDraft.pdf`.

Katrien Beuls, Paul Van Eecke and Luc Steels – A Library of Meta-Level Diagnostics and Repairs for Fluid Construction Grammar

Tessel Bogaard, Jan Wielemaker, Laura Hollink and Jacco van Ossenbruggen – SWISH DataLab: a web interface for data exploration and analysis

Quincy Dalh, Can Lokman and Kishan Nirghin – Tinkr Koen Hindriks, Joost Broekens and Joachim De Greeff – RoboTutor: A Robotic Teaching Assistant

Laura Hollink and Adriatik Bedjeti – ION Demonstrator: an interactive exploration of a multimodal news corpus Caitlin Lagrand, Patrick M. de Kok, Sébastien Negrijn, Michiel van der Meer and Arnoud Visser – Autonomous robot soccer matches

Elise van der Pol and Frans A. Oliehoek – Video Demo: Deep Reinforcement Learning for Coordination in Traffic Light Control

María Dolores Sánchez-García, José Del Sagrado, Antonio Salmerón and Rafael Rumí – PGMs4SDA: a public repository for Probabilistic Graphical Models

Benjamin Timmermans, Zoltán Szlávik and Robert-Jan Sips – Crowdsourcing ground truth data for analysing brainstem tumors in children

Shuai Wang, Steve Tonneau and Nicolas Mansard – Multi-agent Mult-contact Path Planning with HPP

Arlette Van Wissen, Annerieke Heuvelink, Cliff Laschet and Charlotte Vinkers – Dynamic, context-aware behavior change support using distributed reasoning and central processing

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Table 1: The 2016 candidates of the SKBS prize

Since 1999 we have seen many different appearances of the Demo-session. The common characteristic is the emphasis on being "an industrial exhibition". Up to 2006 the prize money was provided by SKBS only. The Foundation for Knowledge Based Systems originates from the late 1980s as a foundation within SPIN (Stimulerings Projectteam In Nederland). The Foundation SNN (Stichting Neurale Netwerken) is another well-known member of the former SPIN. SNN supported SKBS financially with augmenting the SKBS

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prize in 2007. In 2008, the industrial partner Strukton announced its willingness to participate in the prize funding. The extra contribution was gratefully accepted. They continued this policy in 2009, 2010, and 2011. Since 2012 SKBS sponsors the BNAIC by Euro 500,- for the best demo Award.

In 2016, eleven submissions were exhibited in two demonstration rooms for the SKBS prize. All eleven demos were very interesting, but in fact of a different type. In the early years, say 1999-2006 we usually had 8 to 12 demo's, but the last ten years the number was between 4 and 8. Obviously, in Amsterdam 2016 we had a heyday for the demo session. Moreover, the quality of the contributions seemed to be raised. It was a pleasure to see and assess the ingenuity of the demo designers and demo implementations. The jury (referee committee) was given the task to take the following items into consideration by scoring them between 1 and 10: (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. The procedure went in shifts: from eleven we reduced the number of candidates to six, then to three and finally to one.

The main observations were as follows. There was a breakthrough of ideas on (1) the optimalisation of traffic lanes, in particular by controlling them via intelligent traffic lights (see Elise van der Pol and Frans Oliehoek, 3th place), (2) an interaction in the classroom (see Koen Hindriks, Joost Broekens, and Joachim De Greeff, 2nd place, and (3) Robot Soccer. The team consisting of Caitlin Lagrand, Patrick M. de Kok, Sébastien Negrijn, Michiel van der Meer, and Arnoud Visser received the 2016 SKBS prize for their improvements in playing Robot Soccer. Their contributions were quite substantial in comparison with their last year's demo. We mention five of them.

- The ball is now black and white; it means no longer "coloured", so that it is more difficult for the robots to find the place where the ball is.

- The playing field is now symmetric; so that it is more difficult for a robot to orient "himself" on the opponent goal and the own goal (symmetry brings more difficulties)

- The playing field is now more grass-like. This means the field is no longer "solid" and "polished", but it is a bit rough and therefore the movement of the players is somewhat "destabilized".

- Finite State Machines (FSMs) are replaced by rule-based systems endowed with heuristics and scripts.

- The implementation is with Neural Networks and with Daemons (cf. Olivier Selfridge, 1956).

The prize is 500 euro and has been awarded to the Robot Team of the UvA. They will use the money for their trip to Japan, where they will participate in the Robot Cup games.

It is a pleasure to remark that the ream consisted of students, researchers, and a dedicated leader (Arnoud Visser).

In Table 2 we provide an overview of the winners of the SKBS prizes 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
HKTG. 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 Van den Berghe
A Generic Rule Miner for Geographic Data

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

Table 2: Overview of SKBS prizes.

BNAIC 2017 (Groningen)

The 29th Benelux conference on Artificial Intelligence (BNAIC 2017) will be organized by the University of Groningen, under the auspices of BNVKI and SIKS. BNAIC 2017 will be held in Het Kasteel in Groningen, The Netherlands, on November 8-9, 2017. BNAIC 2017 will include invited speakers, research presentations, posters and demonstrations. Authors are invited to submit papers on all aspects of Artificial Intelligence. For more information, see http://bnaic2017.ai.rug.nl/.

BNVKI Membership Fees

In the table below you can find the BNVKI membership fees.

	2017
Regular members	€ 20,-
PhD students	€ 10,-
Master students	€ 10,-

Table 3: BNVKI Registration Fees

Becoming a BNVKI member makes you automatically an ECCAI member and allows you register at a reduced registration rate for certain major events, such as ECAI and ACAI. By increasing the number of

BNVKI members, our AI community can also nominate more colleagues to become ECCAI fellows, as the maximum number of fellows we are allowed to have is proportional to the number of members. Finally, it might be good to know that ECCAI has decided to sponsor international events through invited speakers and these invited speakers need to be an ECCAI member over the past years.

If you want to know where our members are currently located, check out http://wilma.vub.ac.be/ dvan-deun/mapje.html, if your affiliation is not represented, or you would like to see a larger dot, become a member and convince you colleagues to join as well.

BNVKI General Assembly

Present: 7 board members BNVKI, +/- 30 members.

Opening

The General Assembly is opened by the chair of BNVKI, Koen Hindriks.

Minutes General Assembly 2015

The minutes of the previous General Assembly (2015-11-06 in Hasselt) are approved.

Announcements

SIKS will still be collaborating with BNVKI, but will no longer be involved in the editorial board of the newsletter. There will be continued effort to integrate the newsletter with the new website (with the help of a professional company). It is suggested to dedicate a specific section to news related to education (e.g., via the KION network).

Two members of the BNVKI board (Bart Verheij and Tom Lenaerts) will explicitly focus on Community Building. A warm applause for Frank and Virginia Dignum (Organization Chairs) and Frank van Harmelen (General Chair) for their excellent organization of ECAI 2016 in The Hague.

After many years of service for BNVKI, Joke Hellemons will retire. There will be a farewell event on December 15, 2016.

Financial Report

Kurt Driessens (BNVKI treasurer) presents the financial report on the year 2015. See the overview in Figure 2.

The assets available at the end of 2015 were €44.429.

Auditing committee 2015

So far, the financial records for 2015 have been checked by one member of the auditing committee (Kyriakos Efthymiadis). The other member (Max Knobbout) still has to check the records.

	approved at ALV'13	Realized 2015
BENEFITS		
Membership fees	2000	2235
BNAIC profit	1000	863
support	0	0
Bank interest	500	162
From reserve capital	*500*	0
	4000	**3260**
	Profit:	**1086**
EXPENSES		
Website	150	75
ECCAI fee	350	426
Secretarial costs	800	2.65
various	700	571
Sponsoring AI events	2000	1000
	4000	**2174**

Figure 2: Overview of financial report 2015

BENEFITS	
Membership fees	2200
BNAIC profit	1000
support	0
interest	180
From reserve capital	*520*
Flow over from 2016	*1200*
TOTAL	**5100**
EXPENSES	
Website + newsletter	1350
ECCAI fee	450
various	800
Sponsoring AI events	2000
BNVKI thesis award	500
TOTAL	**5100**

Figure 3: Proposed budget for 2017

Proposed budget 2017

The proposed budget for 2017 is shown in Figure 3.
Some remarks on the budget:

- BNVKI aims to keep BNAIC registration costs very low .

- The BNVKI board is working on increasing the number of memberships.

- Sponsor costs are assumed to stay the same as previous years.

- There are plans to add a Benelux-wide BNVKI MSc thesis award (to replace the KION award).

- Last year, the board proposed to use some of the reserve capital to improve the website and newsletter (since the negotiations are still ongoing, this part of the budget flows over to 2017).

The proposed budget for 2017 was approved by the General Assembly. Some additional remarks based on questions from the audience:

- It is suggested to introduce an early registration fee for (BSc and MSc) students.

- NWO offers a specific program ('Incidentele Steun') that allows conference organizers to apply for funding of foreign keynote speakers' travel costs. BNAIC 2016 successfully applied for this, and it may be tried in the coming years again. If this fails, BNVKI might consider funding part of these travel costs for foreign speakers.

- Current BNVKI memberships are 20 Euro (regular) and 10 Euro (students). An option would be to make membership free of charge, but this has some risks since BNVKI pays a small amount to ECCAI for each member.

- BNVKI will try to more actively recruit members within the Benelux AI community.

Auditing Committee 2017

Charlotte Gerritsen (Vrije Universiteit Amsterdam and NSCR) and Arnoud Visser (University of Amsterdam) are proposed as members of the auditing committee 2017.

BNVKI Board

The current members of the BNVKI board are:

- Koen V. Hindriks (chair)

- Tibor Bosse (secretary and vice-chair)

- Kurt Driessens (treasurer)

- Franc Grootjen (student affairs)

- Tom Lenaerts (community builder)

- Marc van Zee (editor newsletter)

- Joost Vennekens (webmaster)

- Bart Verheij (community builder)

- Annerieke Heuvelink (AI & Industry)

Note that Marc van Zee will leave the board early 2017, so the board is looking for a new member (preferably from Luxembourg). Another point of attention is to aim for a more equal balance between male and female board members.

BNAIC 2016

Tibor Bosse (General Co-Chair) presents a summary of BNAIC 2016. The conference attracted 93 submissions, of which 83 were accepted in the various categories (15x A, 47x B, 11x C, 10x D). Altogether, almost 150 people registered for the conference. Currently, there seems to be a surplus of several thousands of Euros, among others thanks to the unexpectedly high income via sponsors. Springer has accepted to publish post-proceedings of BNAIC in their CCIS series. Authors of a number of selected papers will be invited to submit an extended version of their work for publication in this volume. The organizers will write an event report for the BNVKI newsletter. Following an old tradition, this report will make use of brief summaries written by some of the session chairs.

BNAIC 2017

BNAIC 2017 will take place in Groningen, and will be organized (among others) by Bart Verheij and Marco Wiering.

BeneLearn 2017

Benelearn 2017: The annual machine learning conference of the Benelux Eindhoven (the Netherlands), 9-10 June 2017

BeNeLearn is the annual machine learning conference of the Benelux. It serves as a forum for researchers to exchange ideas, present recent work, and foster collaboration in the broad field of Machine Learning and its applications. The 26th edition is hosted by the Data Mining group of Eindhoven University of Technology (TU/e) under the auspices of the Dutch Research School for Information and Knowledge Systems (SIKS) and Data Science Center Eindhoven (DSC/e). Benelearn 2017 is organised as a two-day event on 9-10 June 2017 at TU/e campus.

Board Members BNVKI

Dr. K. (Koen) Hindriks (chair)
Delft University of Technology

Dr. T. (Tibor) Bosse (secretary & vice-chair))
Vrije Universiteit Amsterdam

Dr. K. (Kurt) Driessens (treasurer)
Maastricht University

Dr. F. (Franc) Grootjen (student affairs)
University of Nijmegen

Dr. T. (Tom) Lenaerts (community builder, Belgium)
Université Libre de Bruxelles / Vrije Universiteit Brussel

Prof. Dr. J. (Joost) Vennekens (webmaster)
KU Leuven

Prof. Dr. B. (Bart) Verheij (community builder, the Netherlands)
Rijksuniversiteit Groningen

Dr. A. (Annerieke) Heuvelink (AI & Industry)
Philips Group Innovation, Research

Please visit www.bnvki.nl, section "BNVKI Board Members" for more detailed information.

How to Subscribe?

The BNVKI-AIABN Newsletter is a direct benefit of membership of the BAIAI: Benelux Association for Artificial Intelligence. Membership dues are € 20 for regular members and € 10 for students (AIO's or master). In addition, members will receive access to the electronic version of the European journal AI Communications. The Newsletter appears quarterly. For more information, please visit our website and go to "Membership and Benefits".

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The editorial board welcomes product announcements, book reviews, product reviews, overviews of AI education, AI research in business, and interviews. Contributions stating controversial opinions or otherwise stimulating discussions are highly encouraged. Please send your submission by E-mail (MS Word or text) to board@bnvki.org.

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