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APPLICATIONS OF ALGEBRA IN LOGIC AND COMPUTER SCIENCE – THE PAST AND THE FUTURE

Abstract

We present the history of the conference Applications of Algebra in Logic and Computer Science, whose twenty-third edition will be held in March, 2019. At the end we outline some plans for the future.

Keywords: conference, algebra, logic, applications.

It is our pleasure to announce that the conference Applications of Algebra XXII will be held in hotel Fian in Zakopane from the 5th to the 11th March, 2018. This edition of the conference is organized by the Chair of Logic, Methodology and Epistemology of Jan Długosz University and it is the twenty-second of the series.

Of course, there are logical conferences with a longer tradition, but anyway, twenty-two editions organized year by year by the same small group of people and attracting so many prominent researchers is something to be proud of.

When we started with a small workshop in May 1997, I had no idea that I was sailing into uncharted waters and ahead of me was an exciting and long-lasting adventure. There were three of us – Piotr Wojtylak, Teresa Biegańska, and me – working together at the Institute of Mathematics at Jan Długosz University of Częstochowa (at that time named Pedagogical University), and our aim was to gather a group of friends from some neighboring universities and discuss topics we were all interested in: logic, universal algebra, theoretical computer science and their applications. Without much experience, acting unprofessionally, but full of enthusiasm, we succeeded after all. That week, spent together, working hard but also enjoying ourselves in the beautiful spring scenery of Zakopane, was unforgettable. It was obvious to us that we had to repeat the experience and

have another meeting the following year. And that is how the tradition started.

The group we managed to gather the first year consisted – apart from our colleagues from Częstochowa – of researchers from the University of Wrocław (Jan Zygmunt and Jacek Hawranek), the University of Opole (Katarzyna Hałkowska, Krystyna Piróg-Rzepecka and Krystyna Mruczek among them), the Silesian University (Wojciech Dzik, Tomasz Połacik and Adam Kolany), the Polish Academy of Science (Jacek Malinowski and Leonard Bolc) and the Technical University of Zielona Góra (Kazimierz Głazek). Tadeusz Prucnal from University of Kielce was supposed to come and give a talk on some logics determined by relative systems but, unfortunately, his health problems prevented that. Maybe there was someone else I have forgotten to mention (not many materials from the first meeting were left) but, in general, that was the core for future conferences.

With each passing year we acquired a bit more expertise and experience. With each conference more and more people from different universities joined our group and stayed with us for years. In 1999 Grzegorz Malinowski (University of Łódź), Jerzy Pogonowski (Adam Mickiewicz University), Janusz Czelakowski (University of Opole), Zofia Kostrzycka (Technical University in Opole) and Bogdan and Bożena Staruch (at that time from Pedagogical University in Olsztyn) attended our conference for the first time. I am proud to say that they all have become regular participants of the AALCS meetings.

In 2000 we decided to shift the conference date to the end of February. Since then, the event has always been held during the late winter season, sometimes in the beautiful snowy scenery, sometimes experiencing first glows of the early spring sun.

At first, most talks delivered at the conference concerned logic and universal algebra, for example the notion of truth (Jan Zygmunt), independence (Kazimierz Głazek, Anna Chwastyk), unification (Wojciech Dzik), tolerances (Jerzy Pogonowski, Joanna Grygiel), varieties defined by P-compatible identities (Katarzyna Hałkowska, Krystyna Mruczek, Alina Wojtunik), proof theory (Piotr Wojtylak), inferential logics (Grzegorz Malinowski), orthomodular logics (Jacek Malinowski) or modal logics (Zofia Kostrzycka).

As time went by, we were pleased to see more and more computer scientists. It was in 2001 when Marek Zaionc (Jagiellonian University) came to Zakopane for the first time and gave a lecture on the density of truth in

classical propositional logic. The same year quite a considerable group of computer scientists supervised by Wojciech Penczek and Marian Srebrny from the Polish Academy of Science arrived. They were to attend a few consecutive AALCS conferences. Their talks dealt mainly with cryptography and model verification.

In 2002 we had a first guest from abroad – Luis Cáceres from the University of Puerto Rico. The same year started our tradition of a special session with talks from different areas of science. The first one was on sociology and was delivered by Ewa Malinowska (University of Łódź).

In 2004 we had more participants from abroad: Alessio Lomuscio and Franco Raimondi from the University College of London, both specialists on multi-agent systems, and Srichan Arworn, who worked in the area of graph theory at the University of Chiangmai in Thailand.

However, it was only in 2006 when AALCS became really international and since then English has become the main conference language. It was the tenth meeting of the series and a really jubilee one. For the first time the number of participants exceeded 60 people. To house all of them a bigger hotel was necessary and, in fact, many things had to be organized from scratch. Unfortunately, Piotr Wojtylak was no longer working in Częstochowa, so we needed someone else who would be willing to help us. This is how Anetta Górnicka and Iwona Tyrala became involved in the enterprise. They quickly appeared to be thoroughly reliable and efficient organizers.

That year lectures covered especially wide spectrum of ideas from some model-theoretical constructions (Janusz Czelakowski), through consequence relations for uncertain inference (David Makinson from King's College London) and some generalizations of Boolean algebras (Léonard Kwuida from the University of Bern) to a general philosophical idea of universal logic promoted by Jean-Yves Béziau (at that time from the Neuchâtel University). As a special treat we had a talk on some psychoanalytic contributions to foundational problems in mathematics delivered by Bernard Burgoyne from the Middlesex University. There was also present a group of Thai graph-theoretists, mostly from the Chiangmai University, who have continued to come to Zakopane year by year. David Makinson was accompanied by his wife Miriam, who – according to her own words – fell in love with the conference and has been a participant of every edition since then. She is always ready to help if anything is needed, in particular, to improve a speaker's vocabulary and pronunciation.

In 2007 a considerable group of young computer scientists from the University College London came. It was also a year when we gained a few new regular participants: Sándor Radeleczki from the University of Miskolc (lattice theory), Mirko Navara from the Czech Technical University in Prague (orthomodular lattices), Raja Natarajan from the Tata Institute of Fundamental Research in Mumbai (theory of computing) and Robert Sochacki from the University of Opole (nonclassical logic).

At the next, twelfth edition of AALCS we had again new guests, who decided to return and to contribute to the content of our conference many times: Edouard Wagneur from École Polytechnique de Montréal, a specialist on tropical algebra, Jānis Cīrulis and Sergejs Solovjovs from the University of Latvia, who deal with algebraic logic, and Rafał Gruszczyński from Nicolaus Copernicus University, an expert on Tarski's geometry of solids. We were also proud and pleased to listen to a series of lectures on graph theory given by Vlastimil Dlab from the Carleton University in Canada and a lecture on substructural logic and BCK-algebras by Andrzej Wroński from the Jagiellonian University. Graph theory and discrete mathematics had a strong representation since, apart from Vlastimil Dlab and Thai researchers (a group of five people), there were present Mieczysław Kula, Anna Szczerba-Zubek and Renata Kawa from the Silesian University - they joined the company of regular participants since then, as well. That year we heard also about rough sets (Jouni Järvinen from the University of Turku), contracting semigroups (Bogdana Oliynyk from the Kyiv-Mohyla Academy), quantum logic (Piotr Wilczek from the Poznań University of Technology) and many other interesting topics.

The thirteenth conference continuued in the same pattern. Vlastimil Dlab (and many others) revisited our meeting, but there were also new participants, like Andrzej Pietruszczak from Nicolaus Copernicus University, Piroska Lakatos from the University of Debrecen and Andrzej Wiśniewski from Adam Mickiewicz University, who had a joint talk with Jerzy Pogonowski on incompleteness of effective double frames. That year Katarzyna Grygiel, who has been a regular attendant since her student years and has always offered a helping hand to everybody, made her debut delivering a talk (a joint lecture with Marek Zaionc on random lambda terms).

Next March we hosted around 50 participants in Zakopane from eleven countries. In 2010 Yutaka Miyazaki (at that time from the Hokkaido University) – a specialist on modal logics, Mirosława Kołowska-Gawiejnowicz (Adam Mickiewicz University) – a specialist on Lambek-Grishin calculus

and Gábor Bácso (Hungarian Academy of Science) – an algebraist, arrived for the first (but not the last) time at AALCS. At this edition we listened to lectures on (among others) Fregean varieties (Katarzyna Słomczyńska from the Pedagogical University in Cracow), formal presentation of lattices (Adam Grabowski from the University of Białystok), properties of boolean operators (Klaus Denecke from the Potsdam University), some quasiorders (Marek Nowak from the University of Łódź) or Chu correspondences (Ondrej Krídlo from the University in Košice). That was a year when we moved the conference site to the Hotel Fian.

New participants in 2011, who decided to repeat their visits to AALCS, were Ângela Mestre from Universidade de Lisboa and Orest Artemovych from the Cracow University of Technology. During this edition Paweł Waszkiewicz from the Jagiellonian University contributed his talk on categories. He seemed to enjoy the conference and promised to come again next year. His premature death bereaved us all.

In 2012 Emilia Halušková, an algebraist from the Slovak Academy of Science joined our Zakopane conference. She has been present there ever since.

During conferences in 2012-2013 we listened to talks on unification (Yutaka Miyazaki and Wojciech Dzik), mereology (Rafał Gruszczyński, Andrzej Pietruszczak, Ryszard Miszczyński), rough sets (Sándor Radeleczki), lattice theory (Joanna Grygiel and Katarzyna Grygiel), quantum structures (Mirko Navara), structural completeness (Michał Stronkowski from the Warsaw University of Technology), dualities of some structures (Wiesław Kubiś from the Czech Academy of Science) and many others.

At AALCS XVIII in 2014 Kalle Kaarli from the University of Tartu gave a talk on categorical equivalence of algebras. It was also the first time that Aleksandra Kiślak-Malinowska from the University of Warmia and Mazury joined our annual meeting. That year the Silesian University and Nicolaus Copernicus University had strong representations at the conference.

In 2015 Ewa Malinowska again delivered an interesting talk on sociology, this time devoted to old age in the mind of men and women. Young researchers from Katowice – Anna Glenszczyk, Małgorzata Kruszelnicka and Sławomir Kost – attended that year and also in following years.

In 2016 we were glad to see another group of PhD students, this time from Jagiellonian University: Maciej Bendkowski, Łukasz Lachowski, Piotr Wójcik and Agnieszka Łupińska. Another representative of the younger

generation, Marcin Łazarz from the University of Wrocław, has become a regular participant.

The AALCS conference in 2016 was special for two reasons. First of all it was the twentieth jubilee. On this occasion I prepared a special evening lecture enriched with old photos and we all took a trip down memory lane together. It was not only about how the conference had been changing but also how the world, science and all of us had changed during the preceding twenty years. There were three people present at all twenty editions of AALCS – as well as myself, they were Wojciech Dzik from the Silesian University and Yurij Povstenko from Jan Długosz University. However, there are many participants who attended the conference several times, some of them hardly missing any of the editions (like Zofia Kostrzycka and Andrzej Zbrzezny).

The second reason why I regarded this edition special, was connected with the situation at my university. I was the only person from the first organizing committee who was still working there and at that time I was about to change my affiliation from the Institute of Mathematics and Computer Science to the Institute of Philosophy. Therefore, I assumed it would be the last conference of the series. I was really moved how many people had reacted to that news and declared their support and help to continue the tradition of Zakopane meetings.

Finally, due to both the interest and help of authorities of my new Faculty of History and Linguistics and the decision of my colleagues Iwona Tyrala and Anetta Górnicka to change their affiliation along with me and continue our work, we managed to organize the twenty-first edition of Applications of Algebra in Logic and Computer Science. It was held in the end of March, 2017. We decided to change a bit the formula of the conference and add a philosophical session, to promote ideas from the area of philosophy and history of science, logic and mathematics, in particular. For the first time a special student session was organized, with a shorter talks, for young people who want to present their results for a wider but friendly public.

However, the core of the conference has remained unchanged. Last year, following the tradition, we had an occasion to share ideas concerning universal algebra, for example on Q-sup-algebras (Jan Paseka from the Masaryk University) and decomposition of congruence distributive algebras (Bożena and Bogdan Staruch from the University of Warmia and Mazury), logic, for example about interpolation in NEXT(KTB) (Zofia Kostrzycka from the

Opole Technical University) or about archetypal rules and intermediate logics (Tomasz Połacik from the Silesian University) and computer science, for example on Haskell implementation for classical propositional logic (Szymon Chlebowski and Andrzej Gajda from Adam Mickiewicz University) or on bounded model checking (Agnieszka Zbrzezny from Jan Długosz University), but also philosophy, for example on comparison of Gottlob Frege's logic and Boole's algebra (Gabriela Besler from the Silesian University) or on the significance of mathematical methods for the development of Polish mathematical philosophy (Wiesław Wójcik from Jan Długosz University). Moreover, Yurij Povstenko delivered a talk, continuing his traditional series of colorful lectures devoted to fractional analysis and its applications to physics.

Of course, it is impossible to name all the prominent participants and to describe all the interesting lectures we had an opportunity to listen to during all these years. I have worked a bit on the statistics, to discover that altogether we hosted 180 participants from 64 universities, 19 countries and 4 continents. Since there were 785 participations in total, an average participant attended 4.36 conferences. In my opinion this is our greatest success. It means that lectures are so attractive and the atmosphere so friendly that people want to return, sometimes from far, far away: Japan, India, Thailand, Canada, Puerto Rico, and so on.

More than two decades is a long time. Some of our participants passed away, but they will stay in our memory: among them Kazimierz Głazek, Leonard Bolc, Paweł Waszkiewicz and Grzegorz Bryll. Some others left their universities for another jobs. Some changed their affiliations or retired, but they stayed loyal with us and continue coming to Zakopane – like Mirosław Kurkowski, Yutaka Miyazaki, Edouard Wagneur or Wojciech Dzik.

I mentioned some topics of talks given during consecutive meetings mainly to show some examples and show how wide is the spectrum of science covered by our participants. In general, we admitted a rather open formula, assuming that sometimes quite different approaches can lead to the same result and one can find surprising similarities in remote areas. The encounter of specialists from various fields gives one an opportunity to see well-known objects from another point of view and gain a new, wider perspective.

Up to now, about 600 lectures have been delivered during all editions of the AALCS conference, most of them on universal algebra and logic, many

on general algebra, graph theory, theoretical computer science, functional equations, topology or geometry but some also on didactics, economy, philosophy, engineering, and even psychology and sociology. Algebra can be applied in one way or another in so many areas that our main topic can be extended freely.

One can say that AALCS is an intimate, old-fashioned conference. That is true. We meet for full five days (and nights) in a small hotel surrounded by beautiful mountains. There are no posters, no parallel sessions. Every lecture lasts half an hour or 45 minutes. If someone wants just to drop by to give a short talk in order to earn some points, the Zakopane meeting is not the right place.

In order to keep pace with the changing reality in today's world we are running through our entire life, so a friendly place, where we can stop for a moment, have time to meet other people and listen to them is a value to appreciate. In my opinion, listening is as important as talking. And discussing is even more important. The discussions – about logic, algebra and life – can be pursued not only during sessions but also during coffee breaks or during the traditional trip to the Kasprowy mountain or any other activity popular in Zakopane – skiing, hiking, horse sleigh riding, taking a walk or simply sharing a glass of wine in the evening. It is the best way to start a scientific collaboration and friendship. Sometimes it is also a unique opportunity to gain unusual skills – from cross-country skiing (especially attractive for people from hot countries), through learning Thai dances and songs to yoga lessons. We are really proud to know how many common papers, cooperations and friendships of people from different fields and countries have resulted from the annual meetings in Zakopane.

I hope that there are still people who enjoy this old-fashioned style of conference and therefore, the tradition will be maintained. We would like to encourage more philosophers to join us and contribute rather different approach to logic and applications of universal algebra. We are open to any suggestions or remarks how to enrich and improve our annual event. We will also cooperate happily with anybody, who is ready to help.

This year we have another change in our organizing committee, since Anetta Górnicka does not work in Jan Długosz University any more, and her duties have been taken up by Grzegorz Sitek.

Last year we found it difficult to complete a computer science section, which we consider as an important part of our conference. The researchers

in this field choose rather bigger meetings, with a post-conference publication. We are not able to provide them with that, but they are always very welcome.

The extended versions of papers presented at AALCS conferences, the content of which involved mostly logic or universal algebra, were published in Bulletin of the Section of Logic four times: in volumes 32/1&2 (2003), 35/2&3 (2006), 40/1&2 (2011) and 45/3&4 (2016).

I would like to take this opportunity to thank Grzegorz Malinowski for his support for our efforts during all these years.

There are so many people to thank, without whom the conference could not exist, even if some of them cannot read these words anymore. First of all Piotr Wojtylak for his boldness and imagination to start the enterprise. Katarzyna Hałkowska, Jan Zygmunt, Leonard Bolc and others who encouraged and helped us at the beginning. Kazimierz Głazek, Jerzy Pogonowski and Aleksandra Kiślak-Malinowska for their steady friendship and beautiful conference photos. Wojciech Dzik, Zofia Kostrzycka, Marek Zaionc, Janusz Czelakowski, Miriam Makinson and many, many others for being with us through thick and thin.

Now, I would like to express my gratitude to Andrzej Wiśniewski, who recommended to the Polish Association of Logic and Philosophy of Science that it take the AALCS conference under its auspices, and whose suggestion was accepted. It is due to this fact that we decided to continue the conference with a new affiliation.

Therefore, it is my pleasure to cordially invite all researchers to attend the forthcoming edition of the conference. To find more information (including previous programmes and photos) please consult our website: http://aalcs.pl/

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