

Vienna Center for Logic and Algorithms



Annual Report 2018/2019



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About VCLA



Vienna Center for Logic and Algorithms

The Vienna Center for Logic and Algorithms (VCLA) is a globally unique competence center in the field of logic and algorithm research.

It was founded in September 2011 and officially opened in January 2012 in the presence of the rector of the Technische Universität Wien (TU Wien) Sabine Seidler and Turing Award laureate Edmund M. Clarke. The Center was founded by Stefan Szeider and Helmut Veith and led by both until Helmut Veith passed away in March 2016.

In December 2017, Agata Ciabattoni became the new elected co-chair, and the VCLA board structure changed.

The VCLA was funded by TU Wien for its first four-year period and will continue to be funded for another four years in association with the Doctoral College Logical Methods in Computer Science (LogiCS).



The Center aims at promoting international scientific collaboration in logic and algorithms and communicating Austria's excellence in these two areas of computer science research, using a variety of channels.

These objectives are realized through various activities which include:

- The VCLA International Student Awards for Outstanding Theses
- The LogicLounge series
- The VCLA Workshop Series
- The VCLA series of winter and summer schools
- The VCLA Visitor Program
- Hosting talks by renowned international speakers
- Cooperations, and
- Educational outreach

www.vcla.at

In Memoriam

VCLA co-chair Helmut Veith (1971-2016) passed away in tragic circumstances on March 12, 2016.

Accompanying the rebirth of the Austrian logic scene his marking of the field, space, and time is further on augmented by the students who he mentored, and by his visionary activities of building bridges between the computer science expert and the layman.

Helmut studied Computational Logic at TU Wien, a *studium irregulare* with a curriculum he designed himself, together with Richard Zach. After appointments at TU Munich and TU Darmstadt, he returned to TU Wien for a full professorship in Computer Aided Verification.

Helmut's passion for logic led him to establish not only the Vienna Center for Logic and Algorithms with Stefan Szeider, but also to bring the largest logic conference in history to Austria - the Vienna Summer of Logic. Helmut served as the speaker of the Doctoral College Logical Methods in Computer Science and as the deputy coordinator of the National Research Network Rigorous Systems Engineering (RiSE).

Posthumously, Helmut was awarded



the ERC Advanced Grant - one of the highest academic distinctions in Europe - for his project HYDRA (Harnesing Model Checking for Distributed Algorithms).

In honor of Helmut's advocacy for women in computer science, the TU Wien, the Wolfgang Pauli Institute, and Helmut's friends and colleagues fund the Helmut Veith Stipend for Female Master's Students.

Memorial site listing his achievements in academia and beyond:

http://www.vcla.at/2016/03/

Organization

The VCLA is coordinated by the executive board in consultation with the local board while taking into account the strategic advice from the external advisory board.

Executive Board	Local Board
Agata Ciabattoni (co-chair)	Matthias Baaz
Thomas Eiter	Pavol Cerny
Matteo Maffei	Laura Kovács
Reinhard Pichler	Alexander Leitsch
Stefan Szeider (co-chair)	Martin Nöllenburg
Georg Weissenbacher	Magdalena Ortiz
	Stefan Woltran

External Advisory Board	
Roderick Bloem (TU Graz)	Georg Gottlob (TU Wien/Oxford University)
Nadia Creignou (Université d'Aix-Marseille)	Anuj Dawar (University of Cambridge)
Fedor Fomin (University of Bergen)	Miroslaw Truszczynski (University of Kentucky)
Moshe Y. Vardi (Rice University)	
PR and Project Management	Mihaela Rozman

Collaborations

The VCLA frequently collaborates with the following co-funding institutions:

- Kurt Gödel Society (KGS)
- Austrian Rigorous Systems Engineering (ARiSE)
- Wolfgang Pauli Institute (WPI)
- Institute of Science and Technology Austria (IST Austria)

Logic and Algorithms Groups

The Center is hosted by six research groups at the Faculty of Informatics:

- Algorithms and Complexity Group
- Database and Artificial Intelligence Group
- Formal Methods in Systems Engineering Group
- Knowledge-Based Systems Group
- Theory and Logic Group
- Security and Privacy Group

Activities

The VCLA annual report summarises our activities throughout the year. This report provides details on the events between October 1, 2018, and September 30, 2019. We divide the activities presented in this report in the following subsections:

• LogicLounge

The LogicLounge is a series of public lectures, which brings together the general public and experts from the fields of logic, philosophy, mathematics, computer science, and artificial intelligence.

• Conferences and Workshops

They are organized by the members of the research groups hosting the VCLA.

PhD Schools

PhD summer schools offer PhD Students specialization in the application of practical methods.

• Educational Outreach and science communication

The VCLA is raising awareness about the field of logic and algorithms by running educational outreach projects for teachers and pupils, as well as science communication activities for the general public.

• VCLA International Awards

The annually awarded Awards aim to recognize and support students all over the world for their outstanding Master and Undergraduate Theses in the field of Logic and Computer Science.

• Helmut Veith Stipend

The Helmut Veith Stipend is awarded annually to excellent female students who pursue (or plan to pursue) one of the master's programs in Computer Science at TU Wien.

• Cooperations

The VCLA cooperates with academic programs and initiatives, as well as with initiatives raising awareness about gender mainstreaming and diversity in the field.

Activities - LogicLounge

LogicLounge: Spouseware and Stalkerware

The 16th public lecture in the series of LogicLounges took place on 15 July 2019 at the New School in New York City, USA.

The LogicLounge with Eva Galperin with the title "Spouseware and

Stalkerware – Where Do We Go From Here?" was hosted by the 31st International Conference on Computer-Aided Verification (CAV), and organized by Daniel Schwartz-Narbonne (Amazon Cybersecurity) in collaboration with the VCLA.

In her talk, the director of cybersecurity at the Electronic Frontier Foundation addressed the concerns surrounding the usage of powerful surveillance software for everyday usage. She provided examples of means which can be used by the tech community, the police, and the policymakers to address the issue of deployment of software used for surveillance by individuals. In addition to an overview of utilized existing legal norms, she also shed light on the resources accessible by individuals to safeguard themselves against an attack.



This LogicLounge received the support of the Internet Society – The New York Chapter, which also provided a live stream and post-production of the recording of Galperin's talk, which is available on our YouTube channel.

Since its inception at the Vienna Summer of Logic in 2014, which brought together almost 3000 scientists in the fields of logic, philosophy, mathematics, computer science, and artificial intelligence, the LogicLounge continues to bring together general public and experts in public debates and discussions. The LogicLounge has since become an event travelling between Vienna and the venue of the CAV conference, where it has already become a regular event in memoriam of Prof. Helmut Veith (1971-2016).

The recording is available:

http://www.vcla.at/logiclounge

Activities - Conferences

Kurt Goedel's Legacy: Does Future lie in the Past?

The international experimental conference "Kurt Gödel's Legacy: Does the Future Lie in the Past?" took place 25-27 July 2019 at the University of Vienna.

The conference celebrated the anniversaries of two events that have had an immense influence on the world of science. Alongside the 100th anniversary of the crucial experimental proof of Albert Einstein's general theory of relativity, the conference acknowledged Kurt Gödel's seminal publication that 70 years ago proved that the theory of relativity is compatible with closed timelines. This so-called 'Gödel's rotating universe' shows how time travel is at least mathematically imaginable.

The conference brought together some of the most distinguished cosmologists, physicists, mathematicians, computer scientists, philosophers, and logicians of our time. Among them was the Nobel Prize winner Rainer Weiss, who received the Nobel Prize in Physics in 2017 for his co-discovery of gravitational waves. At the conference in Vienna, we also have had the pleasure to greet philosopher Palle Yourgrau, whose address was his first public appearance after 15 years of silence.

Celebrating the Goedel's Viennese roots, two invited speeches were admission-free for the general public. The first one was Juliet Floyd's talk "*In and Out of Mind: Wittgenstein and Gödel, Post and Turing*" and the second one was John D. Barrow's address with the title "100 Years of Universes", dedicated in memoriam of Austrian physicist Wolfgang Rindler (1924-2019).

Open to the general public was also an exhibition on the life and work of Kurt Gödel and the Gödel Universe, curated by Karl Sigmund, and the Vienna Circle Society.



Alexander Leitsch, Matthias Baaz, Charles L. Bennett, Rainer Weiss, Vesna Sabljakovic-Fritz

Activities - Conferences

...Continuation from page 11

The conference was organized by the Kurt Gödel Society in collaboration with the University of Vienna, the Austrian Academy of Sciences, the research platform TURIS, the Vienna Center for Logic and Algorithms of the TU Wien, the Department Vienna Circle of University of Vienna (Institut Wiener Kreis) and the Vienna Circle Society.

Invited Speakers

- Markus Aspelmeyer (U. of Vienna)
- John D.Barrow (Grasham College)
- Charles L. Bennett (Johns Hopkins U.)
- David Bennett (NASA Goddard Space Flight Center and U. of Maryland)
- George F.R. Ellis (U. of Cape Town)
- Juliet Floyd (Boston University)
- Tom Henzinger (IST Austria)
- Reinhard Kahle (U. Tübingen)
- Jan von Plato, Logic (U. of Helsinki)
- Wolfgang Schleich (U. of Ulm)
- Dana Scott (Carnegie Mellon U.)
- Marika Taylor (U. of Southampton)
- Toby Walsh (UNSW)
- Rainer Weiss (MIT)
- Palle Yourgrau (Brandeis U.)



Chair of the conference, Matthias Baaz, introducing Toby Walsh

Local Organizers

- Peter Christian Aichelburg (U. of Vienna)
- Matthias Baaz, Chair (TU Wien)
- Piotr Chrusciel (U. of Vienna)
- Daniel Grumiller (TU Wien)
- Gary Mar (Stony Brook University)
- Mihaela Rozman, Publicity Chair (TU Wien)
- Vesna Sabljakovic-Fritz (IJCAI and TU Wien)
- Karl Sigmund (U. of Vienna)
- Friedrich K. Stadler (U. of Vienna)

https://kgs.logic.at/goedels-legacy/

The 9th Workshop on Graph Classes, Optimization, and Width Parameters (GROW)

The Algorithms and Complexity Group hosted the 9th Workshop on Graph Classes, Optimization, and Width Parameters (GROW) 23-26 September 2019, at TU Wien.

GROW is a series of workshops that brings together experts from computer science and discrete mathematics to gain a deeper understanding of graph structures. Such insight can lead to efficient algorithms for hard computational problems, whose instances are modelled by graphs.

Between the sixteen contributed talks, the open problem session, and three invited talks, GROW 2019 shed light on several of the "shadowy corners" of the research community rooted in discrete mathematics and algorithms.

The non-academic program continued the tradition rooted in the motto "*mens sana in corpore sano*", with a hike across the hills of Kahlenberg that ended with a dinner featuring typical regional cuisine in one of the hill-side Heurigen restaurants. GROW is an invitation-only workshop held bianually, with previous editions in Europe, North America, and Asia.

In 2019, GROW was supported by the Vienna Center for Logic and Algorithms (VCLA) and the Wolfgang Pauli Institute (WPI).

Invited speakers

- Martin Grohe (RWTH Aachen)
- Daniel Kral (Masaryk University)
- Meirav Zehavi (Ben Gurion U.)

Chairs

- Robert Ganian
- Stefan Szeider

https://grow2019.ac.tuwien.ac.at



9th GROW at the TU Wien, in Vienna, Austria in 2019

The Chinese-Austrian Workshop: Parameterised Algorithms and Fixed-parameter Tractability

The Algorithms and Complexity Group organised the first edition of a mini-workshop to connect Chinese and Austrian scientists who work on parameterised algorithms and fixed-parameter tractability. The workshop took place on 10 August 2019, at TU Wien, Vienna.

The workshop was comprised of five talks followed by discussions of recent research trends and ideas, such as:

Jianer Chen

Progresses in Algorithmic Research on the Maximum Agreement Forest Problem

Yixin Cao

Enumeration of Maximal Induced Subgraphs

Friedrich Slivovsky

Recent Trends in QBF Solving

Stefan Szeider

ComputingGraph and Hypergraph Width-Parameters



Robert Ganian, Stefan Szeider, Jianer Chen, Yixin Cao, Friedrich Slivovsky

Robert Ganian

The Power of Cut-Based Parameters for Edge Disjoint Paths

The workshop is to pave the way to the research cooperation between the participants' research groups as well as to the follow-up workshop.

Organizers

- Stefan Szeider (TU Wien)
- Jianer Chen (Guangzhou U.)
- Yixin Cao (Hong Kong Polytech. U.)

http://www.vcla.at/events/workshop-parameterised-algorithms-and-fixed-parameter-tractability

New Trends in Formal Argumentation Workshop

The 2nd Workshop on New Trends in Formal Argumentation took place on 30 April 2019 at TU Wien. The 2nd instance followed the success of the first workshop from 2017, also organized by the Database and Artificial Intelligence Group.

This workshop brought together twelve researchers from several areas within the diverse field of formal argumentation to discuss recent results and ongoing work on the new challenges.



The 2nd Workshop on New Trends in Formal Argumentation

Argumentation is nowadays a central part of modern Artificial Intelligence research, and the main topic at major AI conferences, with application domains in legal reasoning, multi-agent systems, and decision support.

Key to this research is the field of formal argumentation which studies formal models to represent arguments, methods to infer conclusions from conflicting points of view, and to provide means for automated reasoning for computation of acceptable conclusions.

The workshop was supported by the VCLA and the Wolfgang Pauli Institute.

Invited Speakers

- Federico Cerutti (Cardiff University)
- Sylwia Polberg (Cardiff University)
- Matthias Thimm (U. Koblenz)

Organizers

- Stefan Woltran
- Anna Rapberger
- Martin Diller

https://www.dbai.tuwien.ac.at/ntfa19

The Schematic Mapping Workshop

The 2nd Schematic Mapping Workshop took place 11-12 April 2019, at TU Wien after its successful first edition in 2014 at the University of Essex, UK.

This workshop brought together researchers and practitioners working on various aspects of schematic maps, including cartographers, computer scientists, graphic designers, psychologists, and transport professionals.

The two-day workshop program featured twenty presentations of contributed original research papers as well as several invited position papers and demos, surveying state of the art on various aspects of schematic mapping.

The workshop also hosted an exhibition of posters summarizing ongoing research projects as well as new designs of schematic maps at the U2xU5 Infocenter of Wiener Linien. The venue is a host of a permanent exhibition with information on the planning, construction and operation of the new subway routes.



Hsiang-Yun Wu, Elitza Vasileva, Maxwell Roberts, Georg Gartner, Martin Nöllenbrug

The VCLA contributed to the establishment of the best poster and presentation awards.

The Best Poster Award

Elitza Vasileva and Hsiang-Yun Wu OptiRoute: Interactive Maps for Wayfinding in a Complex Environment

The Best Presentation Award Soeren Nickel Drawing k-linear Metro Maps

The workshop was organized by the Algorithms and Complexity Group of the Faculty of Informatics and the Department of Geodesy and Geoinformation of the TU Wien with the support of the Vienna Center for Logic and Algorithms (VCLA) and Wiener Linien.

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Presentation by Soeren Nickel

Workshop Co-Chairs

- Georg Gartner (TU Wien)
- Martin Nöllenburg (TU Wien)
- Maxwell Roberts (U. of Essex)

Program Committee

- Linden Ball (U. of C. Lancashire)
- David Forrest (U. of Glasgow)
- Elise Grison (SNCF & Société du Grand Paris)
- Zhan Guo (New York U.)
- Bernhard Jenny (Monash U.)
- Alexander Klippel (Pennsylvania State University)
- Menno-Jan Kraak (U. of Twente)
- Wouter Meulemans (TU Eindhoven)

- Daniel R. Montello (U. California)
- Sheila Pontis (Princeton U.)
- Angela Schwering (WWU Münster)
- Alexander Wolff (U. of Würzburg)

Organizers

- Doris Dicklberger (TU Wien)
- Fabian Klute (TU Wien)
- Karin Prater (TU Wien)

https://schematicmapping2019.ac.tuwien.ac.at/



The 2nd Schematic Mapping Workshop, in Vienna, Austria

Helmut-Veith-Memorial Workshop

The third workshop dedicated to the memory of the VCLA co-founder Helmut Veith (1971-2016) took place in the skiing region at the border of Carinthia and Styria, 17-20 January 2019.

The workshop is a continuation of Helmut's and Georg Moser's idea to give the community of logicians in computer science in Austria an opportunity for lively academic debates with internationally renowned researchers amid the pristine nature of the Austrian Alps.

The Helmut Veith Workshop Series is breaking with the routine of academic workshops, and it is an example of how to engineer a different kind of scientific meeting encouraging thought and collaboration.

Like its previous editions, the workshop in 2019 kept the proven format: in the morning, the fourteen attendees offered a 30-minute talk about their current research focus. In the afternoons, they split into groups to take advantage of the 42 km of skiing slopes, the wellness offers of the location, or oneto-one discussions.



Laura Kovacs's talk at the 3rd Helmut-Veith-Memorial Workshop

The workshop continues to provide a forum for intense exchange between established researchers within the discipline of logic in computer science while offering a networking opportunity to motivated students.

The report on this workshop appeared in the ACM SIGLOG Newsletter, issue July 2019, Vol 6, No 3.

Invited Speakers

• Lutz Schröder (FAU Erlanger)

Organizers

- Michael Morak (TU Wien)
- Anna Prianichnikova (TU Wien)
- Ana Sokolova (U. of Salzburg)

https://hvmw.github.io/hvw2019

Workshop on Trends and Applications of Answer Set Programming

The workshop series on Trends and Applications of Answer Set Programming (TAASP) is organized jointly by research groups from Alpen-Adria-Universität Klagenfurt, TU Wien, and Universität Potsdam. TAASP 2018 was the second edition of this workshop and was held at TU Wien, Vienna, 19-20 November 2018.

The first edition of TAASP had been organized as a workshop affiliated with the Joint German/Austrian Conference on Artificial Intelligence (KI) in Klagenfurt in 2016.

TAASP'18 had an exciting programme with fifteen regular presentations covering topics such as temporal aspects, complexity of ASP, applications and language extensions. In addition to the regular presentations, the technical program included two invited talks.

The report on this workshop appeared on the website of the Association for Logic Programming.



Thomas Eiter opening the TAASP 2018

Invited Speakers

- Vladimir Lifschitz (U. Texas at Austin)
- Gerhard Brewka (U. of Leipzig)

Workshop Co-Cairs

- Wolfgang Faber (U. Klagenfurt)
- Gerhard Friedrich (U. Klagenfurt)
- Torsten Schaub (U. Potsdam)
- Thomas Eiter (TU Wien)
- Stefan Woltran (TU Wien)

Organization Committee

- Michael Morak (U. Klagenfurt)
- Philipp Wanko (U. Potsdam)
- Markus Hecher (TU Wien)
- Peter Schüller (TU Wien)

http://www.kr.tuwien.ac.at/events/ taasp18/

Activities - Schools

The Summer School on Security and Privacy for Blockchains and Distributed Ledger Technologies

The 1st International Summer School on Security & Privacy for Blockchains and Distributed Ledger Technologies (DBTL) was organized jointly by members of TU Wien, Princeton University, and SBA Research. In its first edition, it was hosted by the Security and Privacy Group between 2-6 September 2019, at TU Wien.

Presenting high-profile lecturers coming from academia and industry, the first edition of the summer school provided the 85 student, academic, and industry attendees with an opportunity to learn about cutting-edge topics on blockchains and other distributed ledger technologies.





The summer school offered

lectures, hands-on tutorials, poster presentations, hackathons, and workshops, with a focus on published and current high-impact research projects. The school covered cutting-edge topics on blockchains and other distributed ledger technologies to foster understanding of their respective security and privacy specific requirements and guarantees.

The summer school's closing panel moderated by Matteo Maffei highlighted the technologies' disruptive potential, from giving control over citizens' money back to them, to reduce the processing costs of financial transactions, to enabling a worldwide trustworthy distributed computing platform.

Activities - Schools

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It also discussed the grand challenges of blockchain technologies, in particular emphasizing the need for interdisciplinary research for bridging cryptography and economy, and the need to address scalability and sustainability.

The DBLT 2019 was supported by Liquidity Network, Nimiq, Research Institute, Bitpanda, NuCypher, Bolt Labs, the Vienna Center for Logic and Algorithms, and the City of Vienna.

Invited speakers

- Benedikt Angerer (Bitpanda)
- Pascal Berrang (Nimiq)
- Rainer Böhme (U. of Innsbruck)
- Christian Cachin (U. of Bern)
- Jing Chen (Stony Brook University)
- Angelo De Caro (IBM Research)
- Sebastian Faust (TU Darmstadt)
- Bryan Ford (EPFL)
- Arthur Gervais (Imperial College London and Liquidity Network)
- Brigitte Lutz (Stadt Wien)
- Patrick McCorry (King's College London)
- Pedro Moreno-Sanchez (TU Wien)
- Krzysztof Pietrzak (IST Austria)
- Hubert Ritzdorf (ChainSecurity)
- Philipp Schindler (SBA Research)

Organizers

- Matteo Maffei (TU Wien)
- Edgar Weippl (SBA Research)
- Kevin Borgolte (Princeton U.)
- Martina Lindorfer (TU Wien)
- Pedro Moreno-Sanchez (TU Wien)

https://bdlt.school/program

Project ADA: Algorithms Think Differently (Algorithmen Denken Anders)

The project ADA is a 3-year educational outreach program of the VCLA. The project is named after Ada Lovelace (1815 – 1852), who made history as the first programmer.

The project aims to engage pupils from 8 to 18 years old with unplugged as well as programming activities which foster creative computational thinking, which shapes all areas of digitalization that is crucial for innovation, growth, employment, and competitiveness. Furthermore, project ADA recognises the key role that teachers and educators play in introducing children to the fundamental concepts of computer science.

For some decades now – made public by the American computer scientist Jeanette Wing – it has been recognized that people who deal with computer science develop computational thinking.



It is a kind of thinking that is algorithmic and process-oriented, in which abstraction and efficiency play a special role.

The project ADA has been made possible by the funding of the Vienna Business Agency and the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (Former BMVIT). The cooperation partners of the project ADA are Informatik Austria, Austrian Computer Association (OCG), eEducation Austria, Future Learning Lab of PH Wien, and EIS – Education Innovation Studios of Federal Ministry for Education (BMB).

Project ADA consists of five activities:

- World largest human sorting network September 2019
- Publishing of the CS Unplugged collection in German language Autumn 2020
- Hackathons for good artificial intelligence Autumn: Part of the European Code Week
- Diary of a computer scientist Spring: nation-wide workshop series for girls led by female computer scientists
- Science communication events All-year-round

www.ada.wien

World's Largest Sorting Network

On 9 September 2019, fifty high school pupils performed an pararell odd-even sorting on a network with 50 entries. The 1225 colourful tiles laid on the concrete floor in front of the Ernst Happel Stadion in Vienna represented the nodes of the network. This activity represents the world's largest human sorting network ever recorded based on the collection of CS Unplugged.



Eighty pupils of the Klosterneuburg International School and Sir Karl Popper School of Wiedner Gymnasium took part in the activity organized by the VCLA as part of project ADA. The activity was sponsored by the Austrian Economic Chamber - Vienna.

The recording is available:

https://www.ada.wien/index.php/weltrekord-in-sortiernetzwerk/ Such sorting networks are used by numerous algorithms and are an essential part of the CS Unplugged.



CS Unplugged

The CS Unplugged is an open-access collection of materials for teaching computer science without using a computer or other digital devices.

The CS Unplugged will be translated in the German language within the project ADA in cooperation with the research group of Prof. Juraj Hromkovic of ETH Zürich.



1225 tiles representing sorting node:

European Researcher's Night

For the first time, the VCLA joined the European Researchers' Night (ERN), an annual interactive public event designed to raise awareness among the general public about the importance of science and innovation by showcasing current research in various disciplines and researcher's contribution to the society.

At the VCLA exhibition booth, the visitors played with the researchers a pen-and-paper game, which fosters computational thinking. The game called ,*Catch the Virus*' is based on the Cops and Robbers Game (Seymour and Thomas 1993). Professor Stefan Szeider adapted the original game used in the computer science curriculum to resemble a board game for two people.

Thomas Pani playing the game with the daughter of Andrea Mayr-Stalder, EU Code Week Ambassador for Austria, at the ERN 2019.

By playing the game, the visitors experience first-hand how an efficient algorithm is developed. Additionally, at the VCLA's booth, the visitors got acquainted with other activities of project ADA.

Ours was one of the 60 stations of the Austrian edition of the ERN 2019, taking place simultaneously in 340 cities of the Europen Union on 27 September 2019. In Austria, the ERN 2019 was located in Vienna, at the University of the Applied Arts. It was organized by the Practical Robotics Institute Austria, funded by the European Commission under HORIZON 2020 in the framework of the Marie Sklodowska Curie actions.

Agata Ciabattoni, Georg Gottlob, Laura Kovacs, Matteo Maffei, and Stefan Szeider, among others, are recipients of the European Research Council or the Horizon 2020 funding.

http://www.vcla.at/events/european-researchers-night

GEWINN Info Day

The VCLA attended the GEWINN Info-Day, a congress which is yearly visited by more than 6000 pupils aged 16 and above. The congress took place in Vienna, on 16 November 2018.

Under the umbrella of the TU Wien, the VCLA exhibited at the exhibition booth named "ICT Innovations". As the research groups hosting the VCLA are using logic as a tool that enables computer programs to reason about the world, the VCLA presented the visiting high school pupils a gamified example for this powerful tool-this was a logic puzzle. The puzzle was designed originally by Maarten Löffler, University of Utrecht.

The VCLA shared the stage with the OCG (Austrian Computer Association) presenting coding and robotics activities; as well as the Dimension Data; Barracuda; platform CLIP run by OVE (Austrian Electrotechnical Association), and GMAR (Austrian Society for measuring, automation and robot technology).



The congress program consisted of seminars with notable speakers such as Austrian head of the government, Sebastian Kurz, as well as of presentations by nearly 60 exhibitors from the government, research and teaching institutions, expert associations, and forward-looking businesses.

Find the logic puzzle at: http://www.vcla.at/events/logic-in-computer-science-gewinn-infoday-2018



Activities - Distinction

VCLA International Student Awards

The highly successful fourth edition of the VCLA International Student Awards was concluded in September 2019 with the celebration of two winners in two award categories.

The award ceremony was collocated with the 9th Workshop on Graph Classes, Optimization, and Width Parameters (GROW 2019), hosted by the Algorithms and Complexity Group of TU Wien, on 24. September 2019.

Out of thirty-seven submissions in total, one was selected for the Outstanding Master Thesis Award and one for the Outstanding Undergraduate Award by a committee consisting of nineteen internationally recognized researchers. The eligible degrees were awarded between 15 November 2017 and 31 December 2018 (inclusive). The winners were presented with the VCLA International Student Awards by the vice-rector for the academic affairs, Kurt Matyas, the dean elect of Faculty of Informatics, Gerti Kappel, and the chair of the awards committee, Magdalena Ortiz.

Congratulation to the following award recipients:

Master Thesis Award

Martín Muñoz -

Thesis: Descriptive Complexity for Counting Complexity Classes

Supervisors: Marcelo Arenas and Cristian Riveros (Pontificia Universidad Católica de Chile)



Magdalena Ortiz, Kurt Matyas, Martin Munoz, Gerti Kappel *

Activities - Distinction

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Outstanding Undergraduate Award

Alexej Rotar-

Thesis: The Satisfiability Problem for Fragments of PCTL

Supervisor: Jan Kretinsky (TU München)

The VCLA International Student Awards are presented annually. The winners are invited to attend the award ceremony, and they receive a cash prize from an award fund of 2000 EUR. Since 2016 the awards are dedicated to the memory of the initiator of the distinction, Helmut Veith (1971-2016).

Award Committee

- Shqiponja Ahmetaj
- Ezio Bartocci
- Ekaterina Fokina
- Robert Ganian (co-chair)
- Benjamin Kiesl
- Martin Lackner
- Bjoern Lellmann
- Anna Lukina
- Laura Nenzi
- Johannes Oetsch
- Magdalena Ortiz (general chair)
- Revantha Ramanayake (co-chair)



Magdalena Ortiz, Kurt Matyas, Alexej Rotar, Gerti Kappel

- Zeynep G. Saribatur
- Mantas Simkus
- Sebastian Skritek
- Friedrich Slivovsky
- Max Tschaikowski
- Johannes P. Wallner

http://www.vcla.at/vcla-awards/



Activities - Cooperation

Workshop Women in Logic

The 3rd Women in Logic Workshop (WiL) took place on 23 June 2019 and was collocated with 34th Annual ACM/ IEEE Symposium on Logic in Computer Science (LICS) in Toronto, Canada.

The one day workshop was comprised of two invited talks, ten contributed talks and social dinner. The attendees were students, early career as well as established researchers, who work with logic in computer science.

The WiL 2019 was another step forward in the effort of building a community for women in logic following previous instances of WiL in Reykjavik, Iceland in 2017 and Oxford, the UK in 2018.



Social dinner of the 3rd Women in Logic Workshop (Wil

SIGLOG/VCLA Travel Awards

To facilitate students and postdocs, who are the authors of accepted contributions to register and travel to the WiL, the ACM SIGLOG and the VCLA continue to sponsor the SIGLOG/VCLA Travel Awards. The awardees are reimbursed for a part of their travel expenses, and registration costs.

Speakers

- Anne Condon (UBC)
- Zena Ariola (Univ. of Oregon)

Organizers

- Sandra Alves (Universidade do Porto)
- Agata Ciabattoni (TU-Wien)
- Amy Felty, Co-Chair (University of Ottawa)
- Maribel Fernandez (King's College London)
- Sara Kalvala (University of Warwick)
- Delia Kesner (Université Paris Didero)
- Ursula Martin (University of Oxford)
- Valeria de Paiva, Co-Chair (Nuance)
- Catuscia Palamidessi (École Polytechnique)
- Brigitte Pientka, Co-Chair (McGill University)
- Elaine Pimentel (U. F. do Rio Grande do N.)
- Giselle Reis (Carnegie Mellon University)
- Simona Ronchi Della Rocca (U. d. S. di Torino)
- Alexandra Silva (University College London)
- Perdita Stevens (University of Edinburgh)
- Valeria Vignudelli (Ecole N. S. de Lyon)

https://sites.google.com/site/womeninlogic2019/home

Activities - Cooperation

Vienna Ball of Sciences

The VCLA continues to contribute to the annually held Vienna Ball of Sciences' scientific character with activities that stir curiosity. The Ball's fifth edition took place on 26 January 2019, greeting more than 4000 quests in the Vienna City Hall.

On this occasion the VCLA transformed the staircase of the Ball's venue into a living organism.

The doctoral candidate of the FWF funded doctoral college Logical Methods in Computer Science – LogiCS, Anna Lukina, designed a custom 3D projection which is site-specific intended to fit the staircase of the Vienna Town Hall.

The projection features the dancing of the logic symbols designed for the VCLA series of public discussions LogicLounge, as well as figures of the dancers surrounded by a diagram of an atom, which is among the most familiar symbols of science there is. Anna Oberauer (Petukhova) designed the former, and Lilly Pan created the later.



Fassmann, Oliver Lehmann, Michael Ludwig @SciBall/R.Ferrigat

Anna used her research of flocking behaviours in the group of drones when designing the flow of symbols moving or dancing in unison. Dancing presents the very definition of an algorithm and all things Viennese. The Viennese waltz was added to the UNESCO Austrian list of intangible cultural heritage.

The projected sequences go beyond aesthetic expression towards something more fundamental: the cognitive ability to construct symbols that communicate meaning and an interplay between a myriad of disciplines, and among scientists from all around the world, who all share the love for reason and logic.

The recording of the projection:

http://www.vcla.at/2018/11/vienna-ballof-sciences-steps-of-logic

Activities - Cooperation

Logical Methods in Computer Science

The Doctoral College Logical Methods in Computer Science (LogiCS) is a PhD degree program funded by the Austrian Science Fund (FWF), and run jointly by three Austrian universities (TU Wien, TU Graz and JKU Linz).

LogiCS was established in March 2014 by Helmut Veith† and Stefan Szeider. In 2017, the funding body renewed the grant of the PhD program for another 4 years. The speaker of the new LogiCS is Georg Gottlob, the co-speaker is Stefan Szeider.



The faculty of the LogiCS comprises renowned researchers with strong records in research, teaching and advising.

The program is aimed at highly motivated students who want to work in one of three fundamental fields of computer science: Databases and Artificial Intelligence, Verification, and Computational Logic.

The program has been very successful so far: It attracted 68 excellent students worldwide, of which 55% percent are female doctoral candidates.



http://logic-cs.at/phd



Invited Speakers and Visitors

Thirty-six talks by speakers from countries across the world have been hosted by the VCLA during the past year. An online listing with abstracts is available at http://www.vcla.at/category/talks

Dana Scott (Carnegie Mellon University): Free Logic: its Formalization and some Applications

Alexej Rotar (TU München): The Satisfiability Problem for Fragments of PCTL

Martin Munoz (Pontificia Universidad Católica de Chile): Descriptive Complexity for Counting Complexity Classes

Yuri Gurevich (University of Michigan): LOGIC in computer science and software industry (and in mathematics, time permitting)

Tanja Schindler (University of Freiburg): A DPLL(T) theory solver for quantified formulas

Joshua Blinkhorn (University of Leeds): Building Strategies into DQBF Proofs

John D. Barrow (University of Cambridge): 100 Years of Universes

Juliet Floyd (Boston University): In and Out of Mind: Wittgenstein and Gödel, Post and Turing

Alessio Gizzi (Università Campus Bio-Medico): Multiphysics modeling of nonlinear cardiac dynamics: Experiments, Theory and Simulations

Andreas Pieris (University of Edinburgh): Counting Database Repairs under Primary Keys Revisited

Andrea Cali (University of London): Querying Web Data: A Computational Perspective

Peter Stuckey (University of Melbourne): The Multi-Agent Path Finding Problem **Olivia Erdélyi (University of Canterbury):** Why Bother With Regulation and Ethics? We Just Develop the Technology...

Mateus de Oliveira Oliveira (University of Bergen): Some Width Measures for Proofs

Daniel Le Berre (l'Université de Bretagne): Recursive Explore and Check Abstraction Refinement (RECAR)

Anne Schreuder (University of Bonn): Automatic Synthesis of Polynomial Probabilistic Invariants via Geometric Persistence

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Arnaud Durand (Université Paris-Diderot): Introduction to dependence logic and team semantics

Colin Toal (Integrate.ai): Developing software and ML models at IBM, Amazon and integrate.ai

David Basin (ETH Zurich): Security Protocols: Model Checking Standards

Peter Eades (The University of Sydney): How to Draw a Graph ... Revisited

Manuel Sorge (Warsaw University): Clustered, but when? From static to temporal graph algorithms

Dominik Peters (Carnegie Mellon University): Truthful Aggregation of Budget Proposals

Stefan Milius (Friedrich-Alexander Universität Erlangen-Nürnberg): Eilenberg Theorems for Free

Francesco Scarcello (University of Calabria): Tree projection width and fixed-parameter tractable queries

Fabrizio Montecchiani (University of Perugia): Advances on 1-planar graphs

Marijn Heule (Carnegie Mellon University): Massively Parallel Solving of Math Problems

Sanjay Modgil (King's College London): Logic, Argument and Dialectic

Fredrik Heintz (Linköping University): Reasoning and Learning over Streams for Safe Autonomous Systems

Sebastian Rudolph (Technischen Universität Dresden): The Curse of Finiteness: Undecidability of Database-Inspired Reasoning Problems in Very Expressive Description Logics

Luca Cardelli (University of Oxford): Programming with Chemical Reactions

Alice Miller (University of Glasgow): Probabilistic model checking for UAV strategy generation

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Vladimir Lifschitz (University of Texas at Austin): How We Studied the Input Language of gringo

Martin Grohe (RWTH Aachen University): The Graph Isomorphism Problem Dale Miller (Inria Saclay - Île-de-France): Separating Functional Computation from Relations

Marcello D'Agostino (University of Milan): An informational view of classical logic Tomi Janhunen (Tampere University): Writing Declarative Specifications for Clauses

The VCLA was present in the media through its members and activities.

September 28, 2019 (Vienna Center for Logic and Algorithms) Article in Die Presse and DiePresse.at Brücke zwischen digital und analog https://www.diepresse.com/5697387/brucke-zwischen-digital-und-analog

September 21, 2019 (Vienna Center for Logic and Algorithms)

Article on Die Presse.at Schüler als weltgrößtes Sortiernetzwerk https://www.pressreader.com/austria/die-presse/20190921/282020444008849

September 19, 2019 (Vienna Center for Logic and Algorithms) Article on Der Standard Wien: Schüler realisieren weltgrößtes menschliches Sortiernetzwerk https://www.derstandard.at/story/2000108832838/schueler-realisieren-weltgroesstes-menschliches-sortiernetzwerk-in-wien

Article on APA Science Wien: Schüler realisieren weltgrößtes menschliches Sortiernetzwerk https://science.apa.at/site/home/login-memberbereich.html?login_required=1&target=bildung/detail.html?key=SCI_20190919_SCI850634254

Article on Vorarlberg Online Wien: Schüler realisieren weltgrößtes menschliches Sortiernetzwerk https://www.vol.at/wien-schueler-realisieren-weltgroesstes-menschliches-sortiernetzwerk/6357578

September 22, 2019 (Stefan Szeider)

Article in Profil Vielleicht Pandoras Box (PDF) http://www.vcla.at/wp-content/uploads/2019/11/Vielleicht-Pandoras-Box-_-Profil_October_2019.pdf

September 3, 2019 (Thomas Eiter)

Article on Wiener Zeitung.at Wie künstliche Intelligenz gescheiter werden könnte https://www.wienerzeitung.at/nachrichten/wissen/technologie/2025536-Wie-kuenstliche-Intelligenz-gescheiter-werden-koennte.html?em_no_split=1

August 18, 2019 (Stefan Szeider)

Article in Die Furche Raus aus der Blase https://www.furche.at/feuilleton/medien/raus-aus-der-blase-722970?fbclid=IwAR2Pm1DthMkGyJ83Y0R_FVKPrd1ey1sdwHdVh3mizeUPXQWi8tTpDPXacmE

July 31, 2019

The World News Juli 1949: Als Kurt Gödel bewies, dass Zeitreisen möglich sind https://twnews.at/at-news/juli-1949-als-kurt-godel-bewies-dass-zeitreisen-moglich-sind

Article on Der Standard.at Das Universum nach Kurt Gödel https://www.pressreader.com/austria/der-standard/20190731/281479278023373

Article on Der Standard.at Juli 1949: Als Kurt Gödel bewies, dass Zeitreisen möglich sind https://www.derstandard.at/story/2000106856597/juli-1949-als-kurt-goedel-bewies-dass-zeitreisen-moeglich-sind

Article in printed Der Standard Auf Zeitreise mit Kurt Gödel https://www.pressreader.com/austria/der-standard/20190731/281479278023373

July 25, 2019

Article on Futurezone.at/de Zeitreisen in die Vergangenheit sind möglich – sagte ein Mathematiker schon vor 70 Jahren https://www.futurezone.de/science/article226582699/Zeitreisen-in-die-Vergangenheit-sind-moeglich-sagte-ein-Mathematiker-schon-vor-70-Jahren.html

Article in Furche Relativ einflussreich https://www.furche.at/wissen/relativ-einflussreich-558443

Article on Der Standard.at

"Gödel-Universum" erlaubt Zeitreisen in die Vergangenheit https://www.derstandard.at/story/2000106586564/goedel-universum-erlaubt-zeitreisen-in-die-vergangenheit

July 24, 2019

Article on Der Standard Gravitationswellen als mögliche Fenster zu Wurmlöchern https://www.derstandard.at/story/2000106599231/gravitationswellen-als-moegliche-fenster-zu-wurmloechern

Article in Der Standard Das Vermächtnis des Mathematikers Kurt Gödel https://www.pressreader.com/austria/der-standard/20190724/281784220686837

July 23, 2019

APA Science Konferenz zu Gödels Erbe in Wien mit Zeitreise in die Vergangenheit

Article in and on Wiener Zeitung Zeit für Gödel https://www.wienerzeitung.at/nachrichten/wissen/geschichte/2019643-Zeit-fuer-Goedel.html

July 20, 2019

Article in Die Presse Wittgenstein, Gödel und der menschliche Verstand https://www.pressreader.com/austria/die-presse/20190720/282183652637825

July 17, 2019 (Vienna Center for Logic and Algorithms)

APA Science Kurt Gödels Erbe – Freier Eintritt

July 15, 2019 (Vienna Center for Logic and Algorithms)

PHYS.ORG Kurt Gödel's legacy – Time travel is mathematically imaginable https://phys.org/wire-news/324616692/kurt-gdels-legacy-time-travel-is-mathematically-imaginable-un.html

July 15, 2019

Österreich Journal Kurt Gödels Erbe – Zeitreisen sind mathematisch vorstellbar http://www.oe-journal.at/index_up.htm?http://www.oe-journal.at/Aktuelles/!2019/0719/W2/11507kgs.htm

July 12, 2019 (Vienna Center for Logic and Algorithms) APA Science

Kurt Gödels Erbe – Zeitreisen sind mathematisch vorstellbar

July 2019 (Thomas Eiter, Stefan Woltran)

Article in Die Munze Magazin Denkende Maschinen http://www.vcla.at/denkende-maschinen/

June 17, 2019 (Martin Nöllenburg)

Report on Digital City Wien Die perfekte U-Bahnkarte? https://digitalcity.wien/die-perfekte-u-bahnkarte/

May 22, 2019 (LogiCS)

Unterviews in Heureka Logik für das digitale Zeitalter https://www.falter.at/heureka/20190522/logik-fur-das-digitale-zeitalter/182b118072

April 15, 2019

Interview in Miss.at Klischee: 7 Sätze, die wohl jede Technik-Studentin kennt https://www.miss.at/klischee-7-saetze-die-wohl-jede-technik-studentin-kennt/

April 12, 2019 (Stefan Szeider)

Ö1 Matrix Was müssen wir wissen? https://oe1.orf.at/programm/20190412/549840

April 2, 2019 (Martin Nöllenburg)

Article on Monitor.at Die perfekte U-Bahn Karte? Schematic Mapping Workshop an TU Wien https://www.monitor.at/storyid/article/die-perfekte-u-bahn-karte-schematicmapping-workshop-an-tu-wien/

April 1, 2019 (Martin Nöllenburg) APA Science Die perfekte U-Bahn Karte?

March 18, 2019 (LogiCS)

APA Science Award of Excellence: Dissertation an der Fakultät für Informatik der TU Wien mit Staatspreis ausgezeichnet

March 9, 2019 (Stefan Szeider)

Interview for Bürgeranwalt (ORF) Sorge wegen Algorithmen beim AMS (See 5:00) https://tvthek.orf.at/

March 8, 2019 (Agata Ciabattoni, Laura Kovacs, Anna Lukina)

Article on Der Standard.at Warum so wenige Frauen Code knacken wollen https://www.derstandard.at/story/2000099099551/warum-so-wenige-frauen-den-code-knacken-wollen

Interview on Der Standard.at

Anna Lukina, Drohnenforscherin https://www.derstandard.at/story/2000099099551/warum-so-wenige-frauen-den-code-knacken-wollen

March 6, 2019 (Agata Ciabattoni, Laura Kovacs, Anna Lukina)

Article in Der Standard Warum so wenige Frauen Code knacken wollen https://www.derstandard.at/story/2000099099551/warum-so-wenige-frauen-den-code-knacken-wollen

March 1, 2019 (Stefan Szeider)

Interview für Saturn Magazin Kurz gefragt (PDF) http://www.vcla.at/wp-content/uploads/2019/03/Stefan_Szeider_Algorithmen_ Saturn Wien.pdf

February 27, 2019 (Helmut Veith Stipend)

Article in Die Presse Helmut Vith Stipendium: Frauen in der Informatik https://www.diepresse.com/5586877/helmut-veith-stipendium-frauen-in-der-informatik

February 6, 2019 (Vienna Center for Logic and Algorithms) ACM SIGLOG Newsletter, January 2019 Women in Logic workshop (WiL 2018) https://siglog.hosting.acm.org/newsletter-january-2019/

February 5, 2019 (Stefan Woltran)

Report in Computerwelt.at Chancen und Risiken Künstlicher Intelligenz https://computerwelt.at/news/chancen-und-risiken-kuenstlicher-intelligenz/

January 31, 2019 (Thomas Eiter, Peter Schüller)

Article on MyScience.at Künstliche Intelligenz für Europa https://www.myscience.at/news/wire/kuenstliche_intelligenz_fuer_europa-2019-tuwien

January 30, 2019 (Stefan Szeider)

Interview for Radio NJOY 91.3 Der Algorithmus ist rassistisch? http://marbel.at/der-algorithmus-ist-rassistisch/

January 18, 2019 (Laura Kovacs)

Interview in Die Presse Der Weg zur fehlerfreien Software https://www.diepresse.com/5564958/der-weg-zur-fehlerfreien-software

January 18, 2019

Article in Meinbezierk.at Tanzen und experimentieren am Ball der Wissenschaften https://www.meinbezirk.at/wien/c-lokales/tanzen-und-experimentieren-am-ball-der-wissenschaften_a3149925?fbclid=IwAR0PbdRYlUPZKNZ6h4Qyh9UulhFYVxgtvKVx4day5woKCoLy5ANDX2f7txg

January 17, 2019 (Vienna Center or Logic and Algorithms)

Article in the RegioNews Wien – Der Sturm auf den Wissenschaftsball https://www.regionews.at/newsdetail/Wien_Der_Sturm_auf_den_Wissenschaftsball-213733

January 8, 2019 (Vienna Center for Logic and Algorithms)

Article on Informatik Austria "Algorithmen in 60 Sekunden" nominiert für den eAward 2019 https://www.informatikaustria.at/2019/01/08/algorithmen-in-60-sekunden-nominiert-fuer-den-eaward-2019/

January 2, 2019 (Stefan Szeider)

Article in HORIZONT 'Das Problem ist die dumme KI' https://www.horizont.at/digital/news/das-problem-ist-die-dumme-ki-68533

APA Science (Vienna Center for Logic and Algorithms) "Algorithmen in 60 Sekunden" nominiert für den eAward 2019

December 18, 2018 (Vienna Center for Logic and Algorithms)

Report Media eAward 2019: Kategorie "Aus- und Weiterbildung" https://www.report.at/index.php/component/k2/item/93236-eaward-2019-kategorie-aus-und-weiterbildung

November 27, 2018 (Agata Ciabattoni) Newspaper Interview in Kronen Zeitung Die Logik ist überall https://www.pressreader.com/austria/kronen-zeitung/20181127/281870119495007

November 17, 2018 (LogicLounge) Toby Walsh interview for Mittag in Österreich (ORF) Künstliche Intelligenz https://www.youtube.com/watch?v=Z9lxFgTeJEY&feature=youtu.be

Toby Walsh interview for Zeit im Bild (ORF) Künstliche Diagnosen https://www.youtube.com/watch?v=TctO1w1flkU&feature=youtu.be

November 17, 2018 (LogicLounge)

Toby Walsh interview for Guten Morgen Österreich (ORF) Künstliche Intelligenz https://www.youtube.com/watch?v=ySRXGMv5lpM&feature=youtu.be

November 15, 2018 (Vienna Center for Logic and Algorithms)

Article in ÖCG Journal: Das IT-Magazin Algorithmen in 60 Sekunden (Page 45) https://www.ocg.at/sites/ocg.at/files/medien/pdfs/OCG-Journal1802.pdf

October 5, 2018 (LogicLounge)

Interview for Ö1 Kontekst (English and German) Künstliche Intelligenz, Unfreie Kunst, sagenhafter Reichtum und Sehnsucht nach Überlegenheit https://oe1.orf.at/programm/20181005/529473/Kuenstliche-Intelligenz-Unfreie-Kunst-sagenhafter-Reichtum-und-Sehnsucht-nach-Ueberlegenheit

VCLA Chairs



Agata Ciabattoni and Stefan Szeider, co-chairs of the VCLA since December 2017

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Agata Ciabattoni and Stefan Szeider are co-chairs of the Vienna Center for Logic and Algorithms. Stefan Szeider and Helmut Veith (1971-2016) founded the VCLA in 2011, assuming chair's strategic leadership over its activities.

Agata Ciabattoni is a full professor at TU Wien. In 2011 she has been awarded a START prize, the highest Austrian award for early career researchers, for her project Non classical proofs: Theory, Applications and Tools.

Agata Ciabattoni is mainly working in non-classical logics: proof theory, semantics and applications in various fields, ranging from programming languages to Indian Philosophy. Stefan Szeider is a full professor at TU Wien and head of the Algorithms and Complexity Group. He is also the deputy speaker of the Doctoral Program Logical Methods in Computer Science, and scientific co-organizer of the Vienna Gödel Lectures.

In his research, Szeider combines algorithmic and logic-based methods for the efficient solution of hard problems that arise in Artificial Intelligence, Automated Reasoning, and Combina-torial Optimization, complemented by complexity-theoretic methods for es-tablishing theoretical limits and lower bounds.



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Vienna Center for Logic and Algorithms



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