6 — 30 7 5 2019

PROGRAM

SIGMXD/ PXDS 2X19

AMSTERDAM

Welcome to ACM SIGMOD/PODS 2019!

This year, SIGMOD/PODS is held in the city center of Amsterdam, capital of The Netherlands. Amsterdam is an internationally oriented city, home to people with origins from all over the world. This used to be already the case even back in the 16th and 17th century, when Amsterdam was the world's biggest trading and financial center; establishing the world's first stock exchange in 1602.

SIGMOD/PODS 2019 is held in the original Amsterdam Stock and Commodities Exchange, constructed by Dutch architect Berlage between 1896 and 1903, which now serves as the well-equipped Amsterdam Conference Center. This architect and his apprentices (the school of Berlage) left an important mark on the city, being responsible for a major expansion of the city in the early 20th century. The sculptures and drawings in the Exchange building refer to the people behind the commodities traded in the various rooms ("Effecten" - stock; "Graan" - grains), e.g., depicting farmers in the grain exchange room; as a reminder that trading affects society.

Amsterdam is a city that offers many cultural activities, including the world-famous classical Concertgebouw Orchestra, as well as many museums (Amsterdam Museum, Rijksmuseum, Rembrandthuis, Anne Frank Huis). In a slight break with SIGMOD tradition, the SIGMOD opening reception will be held one day later, on Tuesday night, when the SIGMOD/PODS attendees will have exclusive access to the Van Gogh museum. The Wednesday conference dinner is organized across the water in Amsterdam North, in Noorderlicht Cafe in a festival-like environment. This used to be harbour area and was less-populated and industrial, but in the recent decade has become a hotspot for nightlife activities. Amsterdam is also increasingly a hub for data science companies and services, with multiple universities and CWI in the vicinity; which all participate in the organization of SIGMOD/PODS 2019. On Thursday night, after the SIGMOD program finishes, there will be a meetup of Amsterdam Data Science, where the local data science community will be able to mingle with our data management research community.

Overview of SIGMOD 2019

The SIGMOD 2019 Research Program Committee consists of the Program Chair, two Program Vice Chairs, a core committee with 37 members, and a regular committee with 98 members. During the reviewing period, we solicited additional reviews from 16 external reviewers and occasional input from 10 assistant reviewers. The committee received 430 submissions, out of which 12 were desk-rejected (i.e., without review). There was no bidding; instead, reviewer assignments were made using input from Microsoft's Conference Management System, the Toronto Paper Matching System, and the reviewers' background (the detailed assignment procedure is described in a paper which has been submitted for publication to SIGMOD Record). The core committee members had (roughly) double the reviewing load of the regular committee members, and in addition acted as discussion leaders and meta-reviewers for their assigned papers. There were two rounds of submissions, with deadlines in July and November, respectively. Initially, each paper received three reviews. At this point authors could read the reviews and provide feedback about potential factual errors (disclosed to the reviewers) or sensitive issues about potential mishandling (confidentially to the chair). Two additional reviews were solicited for a paper if (a) the reviewers' expertise level was suboptimal, or (b) if there was significant score discrepancy in the first three reviews, or (c) if it was heading for rejection but had received a weak accept (or higher) by at least one reviewer. Papers were discussed extensively online; 10 were accepted based on the first round of reviews, while 311 were rejected. The authors of the remaining 97 papers were asked to revise their papers to address reviewers' criticisms; 78 revisions were ultimately accepted for a total of 88 papers which are presented in the research track. Finally, 12 papers were shepherded after acceptance to guarantee that the camera-ready version addresses all of the reviewers' comments.

Overview of PODS 2019

The PODS Program committee consists of 24 members, including the chair. PODS submissions received at least 4 reviews; papers that include PC members among their authors received at least 5 reviews, and higher standards apply for their acceptance. As in previous years, Easychair was

used as the conference management tool for PODS. Also, as in previous years, PODS operated with two submission cycles. The first cycle allowed for the possibility of papers being revised and resubmitted. For the first cycle, 36 papers were submitted, 4 of which were directly selected for inclusion in the proceedings, and 8 were invited for a resubmission after a revision. The quality of most of the revised papers increased substantially with respect to the first submission, and all of the revised papers were selected for the proceedings. For the second cycle, 51 papers were submitted, 17 of which were selected, resulting in 29 papers selected overall from a total number of 87 submissions. The Best Paper and Best Student Paper awards, as well as the Gems of PODS talks and invited tutorials, were selected by a subcommittee of the PC, while the Alberto-Mendelzon Test-of-Time award winners were chosen by a separate committee appointed by the PODS Executive Committee.

Stefan Manegold, Peter Boncz
SIGMOD'19 General Chairs
CWI, Netherlands

Anastasia Ailamaki
SIGMOD'19 Program Chair
EPFL, Switzerland

Dan Suciu
PODS'19 General Chair
University of Washington

Christoph Koch
PODS'19 Program Chair
EPFL, Switzerland

Contents

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Stefan Manegold (CWI & Universiteit Leiden, The Netherlands)

SIGMOD Honorary Chair
Martin Kersten (CWI & Universiteit van Amsterdam,The Netherlands)

PODS General Chair
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Angela Bonifati (Lyon 1 University, FR)
Benny Kimelfeld (Technion, IL)

New Researcher Symposium Chairs
Katja Hose (Aalborg University, Denmark)
Spyros Blanas (Ohio State University, USA)

Undergrad Research Contest
Jana Giceva (Imperial College London, UK)
Eugene Wu (Columbia University, USA)

Programming Contest
Ravi Rajwar (Intel, USA)
Pınar Tözün (IT University of Copenhagen, Denmark)

DBCares: Policy Against Harassment

ACM SIGMOD/PODS 2019 adheres to the ACM Policy Against Harassment. We strive to ensure that ACM SIGMOD/PODS 2019 is carried out in an inclusive and diverse environment with zero tolerance for discrimination, harassment, or any other form of misconduct. Unacceptable at ACM SIGMOD/PODS is:

Abuse: Any action directed at an individual that (a) interferes substantially with that person's participation; or (b) causes that person to fear for his/her personal safety. This includes threats, intimidation, bullying, stalking, or other types of abuse.

Discriminatory Harassment: Any conduct that discriminates or denigrates an individual on the basis of race, ethnicity, religion, citizenship, nationality, age, sexual or gender identity, disability, or any other characteristic protected by law in the location where the ACM activity takes place.

Sexual Harassment: Unwelcome sexual advances, requests for sexual favors, or other verbal/physical conduct of a sexual nature.

Any participant who experiences unacceptable behavior may contact any current member of the SIGMOD Executive Committee[1], the PODS Executive Committee[2], or DBCares[3]. Please be assured that if you approach us, your concerns will be kept in strict confidence, and we will consult with you on any actions taken.

[1] https://sigmod.org/about-sigmod/
[2] https://sigmod.org/pods/pods-organization/
[3] http://www.vldb.org/vldb_cares.html

Sponsors & Supporters

Supporters

Diamond Sponsor

Platinum Sponsors

Gold Sponsors

Silver Sponsors

Startup Sponsor

Platinum Publisher

Gold Publisher

Silver Publishers

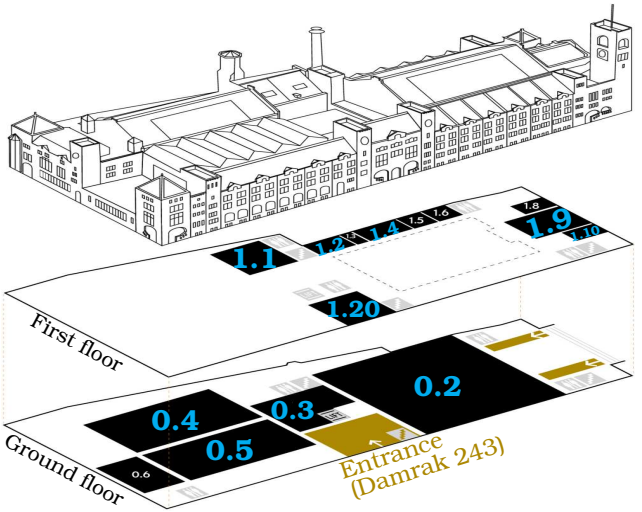
Student support

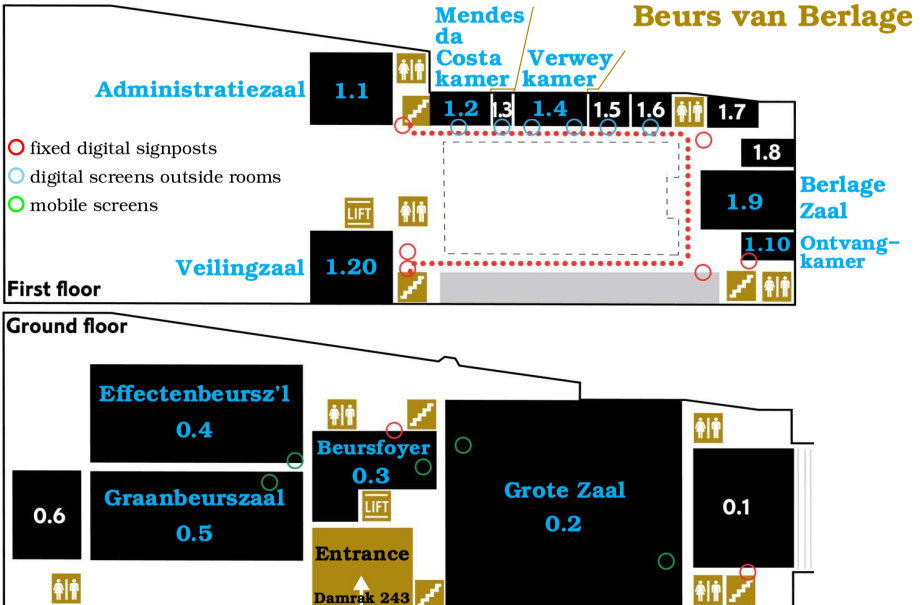
WLAN Information

Wi-Fi name (SSID): SIGMODPODS
Password: incoddwetrust

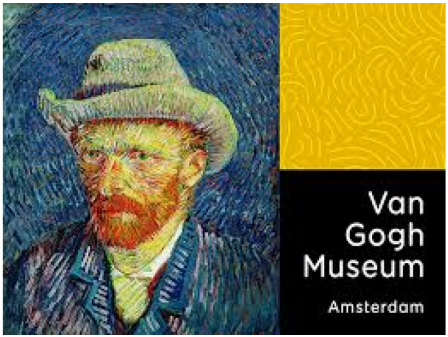
Conference Venue: Beurs van Berlage

When you enter from the street *(Damrak 243)* and walk straight on, you will be in the *Beursfoyer* **(0.3)**. To your right is the *Grote Zaal* **(0.2)** ("zaal" stands for hall in Dutch; "kamer" stands for room). There, all breakfast, coffee breaks, lunches, afternoon demo/poster sessions as well as the PODS Reception on Sunday evening will be held. Also, all sponsor stands are located in the Grote Zaal. To your left are the *Graanbeurszaal* **(0.5)** and the *Effectenbeurszaal* **(0.4)**. Both are large halls, of which the latter will be used for all plenary sessions. Upstairs are the other, smaller, halls and rooms: *Administratiezaal* **(1.1)**, *Mendes da Costa kamer* **(1.2)**, *Verwey kamer* **(1.4)**, *Berlage zaal* **(1.9)**, *Ontvangkamer* **(1.10)**, *Veilingzaal* **(1.20)**.




Beurs van Berlage
Mendes da Costa kamer
Verwey kamer
Administratiezaal
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
Berlage Zaal
1.10
Ontvang-kamer
fixed digital signposts
digital screens outside rooms
mobile screens
LIFT
Veilingzaal
1.20
First floor
Ground floor
Effectenbeursz'l
0.4
Beursfoyer
0.3
Grote Zaal
0.2
0.1
0.6
Graanbeurszaal
0.5
LIFT
Entrance
Damrak 243

SIGMOD Reception – Van Gogh Museum (sponsored by MonetDB)



The Van Gogh Museum maintains the world's largest collection of the works of the world's most popular artist - Vincent van Gogh (1853-1890), his paintings, drawings and letters, completed with the art of his contemporaries. Each year, it receives 1.6 million visitors, making it one of the 25 most popular museums in the world.

SIGMOD/PODS'2019 and the event's sponsor **MonetDB**, are proud to offer all participants registered to the main conference exclusive access to the Van Gogh Museum for the SIGMOD reception on Tuesday July 2, 2019, from 20:30 until 23:00. Your badge is your ticket into the museum, **you must bring it with you!**

There will be time to visit the museum; at the end of the walking route, back in the foyer, there will be drinks and snacks served. The reception food is intended to be dinner-replacing under moderate appetite.

Please note, again, the SIGMOD reception is on **Tuesday** evening (not Monday evening as usual in SIGMOD). That day, the main program ends around 19:50; so participants have 40 minutes to get to the Museum, which is in the south center of Amsterdam (whereas the Beurs van Berlage conference center is in the middle of the center). You can find the directions below.

- Walking: 29 min (Instructions: tiny.cc/m3kf7y)

Leave the venue taking a left and walk south to Dam square, and straight on into Rokin. Continue walking on Rokin until its end, at Munt tower. Continue into Muntplein which becomes Vijzelstraat until crossing the first main canal bridge, after which you take a right onto Herengracht. At the first opportunity you then go left into the Nieuwe Spiegelgracht. Continue this one straight, crossing no less than 4 canals (Prinsen, Keizers, Lijnbaans, Singel). The road passes under the Rijksmuseum; and continuing straight you will hit the Van Gogh museum.

- Cycling: 10 min (Instructions: tiny.cc/m3kf7y)

You can follow the same route as with walking, above. Use the bicycle path (or street), though, rather than the pedestrian sidewalk.

- Metro 52: 19 min (Instructions: tiny.cc/vmkf7y)

Leave the venue taking a left and walk south to Dam square, and straight on into Rokin. Earlier than indicated on the Google map, right after leaving Dam Square, there is a metro entrance, in front of Hudon's Bay. Metro 52 is Amsterdam's newest metro and its stations are quite beautiful. Take the metro in southward direction (Station Zuid) and exit at the very first stop (Vijzelgracht). Outside, take a right at the big roundabout into Weteringsschans. At the first main crossing, take a left onto the Museumbrug (bridge). The road passes under the Rijksmuseum; and continuing straight you will hit the Van Gogh museum. *(Involves ca. 16 min walking.)*

- Tram 24: 20 min (Instructions: tiny.cc/vm6i7y)

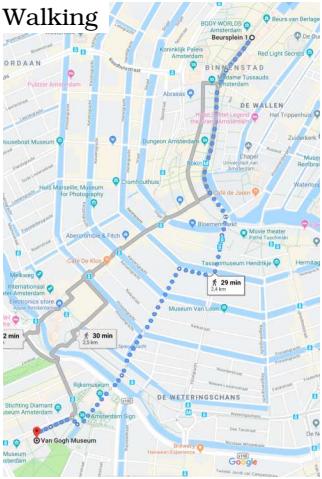
Leave the venue taking a left and walk south to Dam square. At the tram stop just before Dam square, take tram 24 in southward direction (VU medisch centrum). At the 4th stop (Marie Heinekenplein), just after passing the former Heineken Brewery building (now hosting the "Heineken Experience") leave the tram, walk a few steps back and turn left (westward) into Eerste Jacob van Campenstraat. Continue staight on westward, crossing a canal, until Museum Plein (Square) opens in front of you. On your left-hand side, across the grass field, you see the new entrance hall of the Van Gogh Museum. *(Involves ca. 12 min walking.)*

- Tram 2/12: 17 min (Instructions: tiny.cc/fdkf7y)

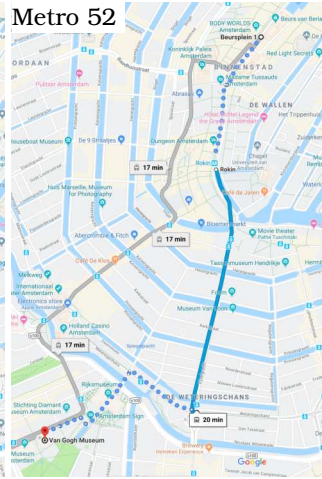
Leave the venue taking a left and walk south to Dam square. At Dam square, go right and walk in between the Palace and the Church to the Nieuwezijds Voorburgwal. There is a tram stop there, where you can either take tram 2 or 12 – they take the same route up until its 7th stop, Van Baerlestraat, where you exit. The tram will just have passed the Van Gogh museum (it is on the left side seen from the tram), so you have to walk back a bit and cross the street. *(Involves ca. 6 min walking.)*

You can of course also try to take a taxi or Uber, but taxi drivers will not be enthusiastically accepting such short trips; doing so will also not be much faster than the other options (or even slower, when stuck in a traffic jam) and quite expensive. Using a car is only recommended if walking is impossible for you. If you just want to minimize walking distance, the last option above (Tram 2 or 12) involves least walking.

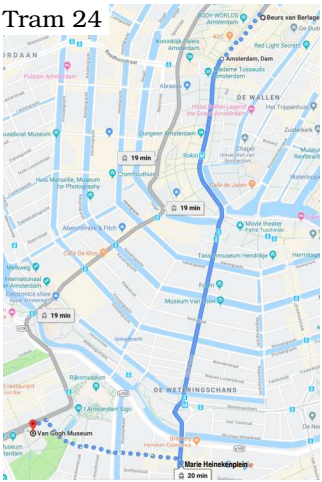
Walking



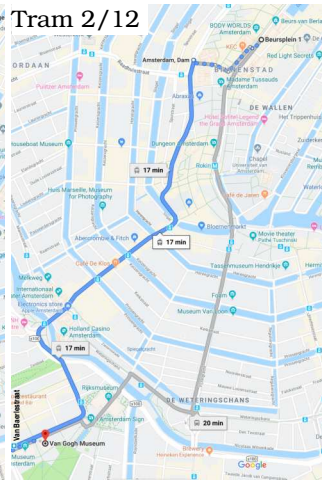
Metro 52



Tram 24



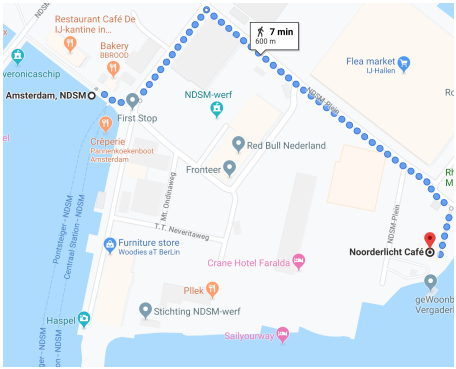
Tram 2/12



SIGMOD Banquet (sponsored by Facebook)

For this year's SIGMOD we have organized something different: The dinner will take place outdoors in a festival-like atmosphere in the post-industrial setting of the former shipyards of Amsterdam-North. Though only 15 minutes away from Central Station, the NDSM-yard is an open space for serenity, creativitiy and festivities all throughout the year.
With a magnificent backdrop of the river "IJ", our dinner location "Noorderlicht" is a well-known counter-culture location for hanging out with friends, having a drink and listening to music. We trust the relaxed atmosphere there will rub off on SIGMOD attendants. We will serve locally sourced and produced food and beverages from several food trucks. There will be tents, barbecue, fire places and more. We do have a plan B for if it should rain unexpectedly.
Hereby we would like to thank Facebook for sponsoring this event.
Attendants will be transferred to Noorderlicht by way of a canal cruise passing through the UNESCO world heritage canals of historic Amsterdam. The cruise will leave close by the conference venue (at the Stromma jetties, close by the venue on your right-hand side when exiting it) and will take ca. one hour. The cruise concludes right in front of the dinner location. Everybody will be assigned a time slot ticket for the start of their cruise, please keep to your assigned time, or swap tickets with somebody else.
For the way back to the city center, we will take the free municipal ferry service back to central station, with the last ferry leaving at midnight. The ferry terminal is a short (400m) walk away from Noorderlicht.

Beurs van Berlage → Stromma jetties



Noordelicht Cafe → ferry terminal

SIGMOD Awards

SIGMOD Test of Time Award

"Privacy integrated queries: an extensible platform for privacy-preserving data analysis" by Frank McSherry, ACM SIGMOD 2009..

The awards committee considers this paper a major scholastic contribution in the way we should handle one of the core challenges in data management. The paper has become a landmark reference for research on a privacy preservation in these modern times geared at automated data analysis with privacy implications.

Frank McSherry *is the Chief Scientist at Materialize, Inc., where he works on interactive and incremental data processing. Frank was previously at the Systems Group at ETH Zürich where he worked with students on timely and differential dataflow, and even further back at MSR Silicon Valley where he worked on the Naiad project and on Differential Privacy. Frank is perhaps best known for applying his undergraduate education to big data problems.*

SIGMOD Contribution Award

The committee reached an unanimous decision to grant the SIGMOD Contribution Award award to **Ahmed Elmagarmid**, especially for his dedicated service to the database community in North America and the Middle East, as the founder/editor of Distributed and Parallel Database Journal, and PC for ACM SIGMOD.

Ahmed Elmagarmid *is the founding executive director of the Qatar Computing Research Institute and is an Emeritus Professor of Computer Science at Purdue University. He served as Chief Scientist at Hewlett Packard and Chief of Data Quality at Bellcore. Dr. Elmagarmid is a recipient of the NSF Presidential Young Investigator (PYI) award from President Reagan in 1988. He is an IEEE Fellow, an ACM Fellow and an AAAS Fellow. The University of Dayton and Ohio State University have both named him among their distinguished alumni. His claim to fame is that he shared an office as graduate student with Prof. M.T.Ozsu.*

SIGMOD E.F. Codd Innovation Award

The awards committee selected **Anastasia Ailamaki** as the recipient of the 2019 ACM SIGMOD Edgar F. Codd Innovations Award *for her pioneering work on the architecture of database systems, its interaction with computer architecture, and scientific data management.*

Anastasia Ailamaki *is a Professor of Computer and Communication Sciences at EPFL and the co-founder of RAW Labs SA, a Swiss company that develops a software engine for real-time analysis of heterogeneous big data. Previously, she was on the faculty of the Computer Science Department at CMU, where she held the Finmeccanica endowed chair. She has received the 2019 EDBT Test of Time award, the 2018 Nemitsas Prize in Computer Science, an ERC Consolidator Award (2013), the European Young Investigator Award from the European Science Foundation (2007), an Alfred P. Sloan Research Fellowship (2005), and ten best-paper awards in database, storage, and computer architecture conferences. She is an ACM fellow, an IEEE fellow, and an elected member of the Swiss, the Belgian, and the Cypriot National Research Councils.*

SIGMOD Jim Gray Doctoral Dissertation Award

Winner: Joy Arulraj

Thesis Title: "The Design and Implementation of a Non-Volatile Memory DBMS", supervised by Andy Pavlo at the Carnegie Mellon University.

Joy Arulraj *is an assistant Professor of Computer Science at Georgia Institute of Technology. He received his Ph.D. from Carnegie Mellon University in 2018, advised by Andy Pavlo. His doctoral research focused on the design and implementation of non-volatile memory database management systems. This work was conducted in collaboration with the Intel Science and Technology Center for Big Data, Microsoft Research, and Samsung Research.*

Honorable Mention: Bas Ketsman

Thesis Title: "Asynchronous Adventures: Formal Approaches to Querying Big Data in Shared-Nothing Systems" supervised by Frank Neven at the Hasselt University & the Transnational University of Limburg.

Bas Ketsman *is a postdoctoral researcher at the Swiss Federal Institute of Technology in Lausanne (EPFL). In 2017 he obtained his PhD from Hasselt University in Belgium, advised by Frank Neven, where he was a PhD fellow of the Research Foundations - Flanders (FWO) and a member of the Databases and Theoretical Computer Science group. His research focuses on foundational aspects of large-scale data management and distributed computing. Bas' papers were selected for the ACM SIGMOD Research Highlight Award, listed in ACM best of Computing, and appeared as research Highlight in CACM. He also received the Distinguished Dissertation Award 2018 from the European Association for Theoretical Computer Science (EATCS) and best paper awards at ACM PODS 2014 and 2015.*

SIGMOD Best Paper Award

"Interventional Fairness : Causal Database Repair for Algorithmic Fairness" by Babak Salimi, Luke Rodriguez, Bill Howe, Dan Suciu.

Abstract. Fairness is increasingly recognized as a critical component of machine learning systems. However, it is the underlying data on which these systems are trained that often reflect discrimination, suggesting a database repair problem. Existing treatments of fairness rely on statistical correlations that can be fooled by statistical anomalies, such as Simpson's paradox. Proposals for causality-based definitions of fairness can correctly model some of these situations, but they require specification of the underlying causal models. In this paper, we formalize the situation as a database repair problem, proving sufficient conditions for fair classifiers in terms of admissible variables as opposed to a complete causal model. We show that these conditions correctly capture subtle fairness violations. We then use these conditions as the basis for database repair algorithms that provide provable fairness guarantees about classifiers trained on their training labels. We evaluate our algorithms on real data, demonstrating improvement over the state of the art on multiple fairness metrics proposed in the literature while retaining high utility.

Babak Salimi *is a postdoctoral research associate at University of Washington, where he works with Professor Dan Suciu. He received his Ph.D. from Carleton University, where he worked with Professor Leopoldo Bertossi. His research interests cover data management, decision making systems, causal inference and algorithmic fairness.*

Luke Rodriguez *is a PhD Student advised by Bill Howe in the Information School at the University of Washington whose research focuses on using tools from differential privacy and causal reasoning to support scientific collaboration and responsible data management. In particular, Luke seeks to investigate how we can go beyond accessibility and availability and make data more useful.*

Bill Howe *is Associate Professor in the Information School and Adjunct Associate Professor in the Allen School of Computer Science & Engineering and the Department of Electrical Engineering. His research interests are in data management, curation, analytics, and visualization in the sciences. As Founding Associate Director of the UW eScience Institute, Howe played a leadership role in the Data Science Environment program at UW through a $32.8 million grant awarded jointly to UW, NYU, and UC Berkeley, and founded UW's Data Science for Social Good Program. With support from the MacArthur Foundation and Microsoft, Howe directs UW's participation in the Cascadia Urban Analytics Cooperative, where he focuses on responsible data science. He founded the UW Data Science Masters Degree, serving as its inaugural Program Chair, and created a first MOOC on data science that attracted over 200,000 students. His research has been featured in the Economist and Nature News, and he co-authored what have remained the most-cited papers from VLDB 2010 and SIGMOD 2012. He has received two Jim Gray Seed Grant awards from Microsoft Research and two "Best of Conference" invited papers from VLDB Journal. He has a Ph.D. in Computer Science from Portland State Univ. and a BSc degree in Industrial & Systems Engineering from Georgia Tech.*

Dan Suciu *is a Professor in Computer Science at the Univ. of Washington. He received his Ph.D. from the Univ. of Pennsylvania in 1995, was a principal member of the technical staff at AT&T Labs and joined the Univ. of Washington in 2000. Suciu is conducting research in data management, with an emphasis on topics related to Big Data and data sharing, such as probabilistic data, data pricing, parallel data processing, data security. He is a co-author of two books Data on the Web: from Relations to Semistructured Data and XML, 1999, and Probabilistic Databases, 2011. He is a Fellow of the ACM, holds twelve US patents, received the best paper award in SIGMOD 2000 and ICDT 2013, the ACM PODS Alberto Mendelzon Test of Time Award in 2010 and in 2012, the 10 Year Most Influential Paper Award in ICDE 2013, the VLDB Ten Year Best Paper Award in 2014, and is a recipient of the NSF Career Award and of an Alfred P. Sloan Fellowship. Suciu serves on the VLDB Board of Trustees, and is an assoc. editor for the Journal of the ACM, VLDB Journal, ACM TWEB, and Information Systems and is a past associate editor for ACM TODS and ACM TOIS. Suciu's PhD students Gerome Miklau, Christopher Re and Paris Koutris received the ACM SIGMOD Best Dissertation Award in 2006, 2010, and 2016 respectively, and Nilesh Dalvi was a runner up in 2008.*

SIGMOD Systems Award

The SIGMOD Systems Award is awarded to an individual or set of individuals to recognize the development of a software or hardware system whose technical contributions have had significant impact on the theory or practice of large-scale data management systems. The SIGMOD Systems Award Committee determines the recipient(s) of the award. This year's award was given to the developers of the Aurora database system from Amazon AWS.

The developers of the Aurora database system are the recipients of the 2019 SIGMOD Systems Award for fundamentally redesigning relational database storage for cloud environments.

Award Recipients:

- Xiaofeng Bao
- Charlie Bell
- Murali Brahmadesam
- James Corey
- Neal Fachan
- Raju Gulabani
- Anurag Gupta
- Kamal Gupta
- James Hamilton
- Andy Jassy
- Tengiz Kharatishvili
- Sailesh Krishnamurthy
- Yan Leshinsky
- Lon Lundgren
- Pradeep Madhavarapu
- Sandor Maurice
- Grant McAlister
- Sam McKelvie
- Raman Mittal
- Debanjan Saha
- Swami Sivasubramanian
- Stefano Stefani
- Alex Verbitski

PODS Awards

PODS Albert O. Mendelzon Test of Time Award

The ACM PODS Alberto O. Mendelzon Test-of-Time Award is awarded every year to a paper or a small number of papers published in the PODS proceedings ten years prior that had the most impact in terms of research, methodology, or transfer to practice over the intervening decade. After careful consideration and having solicited external nominations and advice, we have selected the following paper as the award winner for 2019:

"A General Datalog-Based Framework for Tractable Query Answering over Ontologies" by Andrea Cali, Georg Gottlob, Thomas Lukasiewicz, PODS 2009.

Abstract. Ontologies and rules play a central role in the development of the Semantic Web. Recent research in this context focuses especially on highly scalable formalisms for the Web of Data, which may highly benefit from exploiting database technologies. In this paper, as a first step towards closing the gap between the Semantic Web and databases, we introduce a family of expressive extensions of Datalog, called Datalog$^{\pm}$, as a new paradigm for query answering over ontologies. The Datalog$^{\pm}$ family admits existentially quantified variables in rule heads, and has suitable restrictions to ensure highly efficient ontology querying. We show in particular that Datalog$^{\pm}$ encompasses and generalizes the tractable description logic $\mathcal{EL}$ and the *DL-Lite* family of tractable description logics, which are the most common tractable ontology languages in the context of the Semantic Web and databases. We also show how stratified negation can be added to Datalog$^{\pm}$ while keeping ontology querying tractable. Furthermore, the Datalog$^{\pm}$ family is of interest in its own right, and can, moreover, be used in various contexts such as data integration and data exchange. It paves the way for applying results from databases to the context of the Semantic Web.

Citation from the Committee. *This paper introduces and studies the Datalog+/- framework for query answering over ontologies, which subse-*

quently became highly influential in both the database and knowledge representation communities. Its main contribution is an in-depth study of the data complexity of Datalog+/-, and several extensions and restrictions tailored to ontologies. The paper identifies a tractable family of Datalog+/- formalisms, based on linear tuple-generating dependencies, that generalizes description logics of the DL-Lite family. Extensions with keys and stratified negation are also studied. Other technical results of the paper concerning the chase have been fundamental to further developments in the field. The paper received over 450 citations, evidencing its significant impact.

Andrea Cali *is a Senior Lecturer at the Department of Computer Science and Information System, Birkbeck University of London. He also holds positions as Research Scientist at RelationalAI Inc., as well as Associate Member at the Oxford-Man Institute of Quantitative Finance, University of Oxford. His research interests include database theory, Deep Web, Semantic Web, Machine Learning and Information Integration. He is currently undergoing new research directions in the area of cryptocurrencies.*

Georg Gottlob *is Professor of Informatics at Oxford and at TU Wien. His interests include database theory, AI, knowledge representation, logic and complexity, problem decompositions, and, on the more applied side, web data extraction, and practical database query processing. Gottlob has received the Wittgenstein Award (Austria) and the Ada Lovelace Medal (UK)., He is an ACM Fellow, an ECCAI Fellow, a Fellow of the Royal Society, and a member of the Austrian and the German academies of of Sciences, and the Academia Europaea. He chaired the Program Committees of IJCAI 2003 and ACM PODS 2000. He was the main founder of Lixto, a web data extraction software company, which was acquired by McKinsey in 2013. Gottlob was awarded an ERC Advanced Investigator's Grant for the project "DIADEM: Domain-centric Intelligent Automated Data Extraction Methodology". Based on results of this project, he co-founded Wrapidity Ltd, a company that specialises in fully automated web data extraction that was recently acquired by the Meltwater Media Intelligence corporation.*

Thomas Lukasiewicz *is currently a Professor of Computer Science with the Department of Computer Science, University of Oxford, UK, and a Turing Fellow with the Alan Turing Institute, London, UK. Prior to this, he was holding a prestigious Heisenberg Fellowship by the German Research Foundation (DFG), affiliated with the University of Oxford, TU Vienna, Austria, and Sapienza University of Rome, Italy. His research interests are in artificial intelligence (AI) and information systems, including especially knowledge representation, uncertainty in AI, machine learning, the (Social and/or Semantic) Web, and databases. He received the IJCAI-01 Distinguished Paper Award, the AIJ Prominent Paper Award 2013, and the RuleML 2015 Best Paper Award. He is area editor for the journal ACM TOCL, associate editor for the journals JAIR and AIJ, and editor for the journals Semantic Web and Heliyon.*

PODS Best Paper Award

"Efficient Logspace Classes for Enumeration, Counting, and Uniform Generation" by Marcelo Arenas,Luis Alberto Croqueviell, Rajesh Jayaram, Cristian Riveros.

Abstract. In this work, we study two simple yet general complexity classes, based on logspace Turing machines, which provide a unifying framework for efficient query evaluation in areas like information extraction and graph databases, among others. We investigate the complexity of three fundamental algorithmic problems for these classes: enumeration, counting and uniform generation of solutions, and show that they have several desirable properties in this respect. Both complexity classes are defined in terms of nondeterministic logspace transducers (NL transducers). For the first class, we consider the case of unambiguous NL transducers, and we prove constant delay enumeration, and both counting and uniform generation of solutions in polynomial time. For the second class, we consider unrestricted NL transducers, and we obtain polynomial delay enumeration, approximate counting in polynomial time, and polynomial-time randomized algorithms for uniform generation. More specifically, we show that each problem in this second class admits a fully polynomial-time randomized approximation scheme (FPRAS) and a polynomial-time Las Vegas algorithm for uniform generation. Interestingly, the key idea to prove these results is to show that the fundamental problem #NFA admits an FPRAS, where #NFA is the problem of counting the number of strings of length n accepted by a nondeterministic finite automaton (NFA). While this problem is known to be #P-complete and, more precisely, SpanL-complete, it was open whether this problem admits an FPRAS. In this work, we solve this open problem, and obtain as a welcome corollary that every function in SpanL admits an FPRAS.

Marcelo Arenas *is a Professor at the Department of Computer Science at the Pontificia Universidad Catolica de Chile, and the director of the Millennium Institute for Foundational Research on Data. He received a Ph.D. from the University of Toronto in 2005. His research interests are in the areas of data management, applications of logic in computer science and Semantic Web. Marcelo Arenas has received an IBM Ph.D. Fellowship (2004), a SIGMOD Jim Gray Doctoral Dissertation Award Honorable Mention in 2006 for his Ph.D. dissertation "Design Principles for XML Data", the 2016 Semantic Web Science Association (SWSA) Ten-Year Award for the article "Semantics and Complexity of SPARQL" and eight best paper awards (PODS 2003, PODS 2005, ISWC 2006, ICDT 2010, ESWC 2011, PODS 2011, WWW 2012 and ISWC 2014). He has served on multiple program committees and editorial boards, and he has chaired the program committees of ICDT 2015, ISWC 2015 and PODS 2018.*

Luis Alberto Croquevielle *is a student at Pontificia Universidad Católica de Chile, where he has just finished his Master of Science, advised by Marcelo Arenas. His master's research focused on the study of enumeration problems, and its relation to other questions such as counting and uniform generation. His work was supported by the Instituto Milenio de Investigación sobre los Fundamentos de los Datos (IMFD), and conducted in collaboration with other researchers of IMFD.*

Rajesh Jayaram *is a PhD student in theoretical computer science at Carnegie Mellon University, advised by David Woodruff. Prior to beginning his PhD in 2017, Rajesh received his B.S. in Mathematics and Computer Science from Brown University. His research focuses primarily on streaming and sketching algorithms for problems in big-data, as well as lower bounds for these problems. In particular, his work frequently involves applying techniques from dimensionality reduction and the randomized analysis of algorithms to obtain efficient algorithms for big data-sets.*

Cristian Riveros *is an assistant professor at the Department of Computer Science at PUC Chile and a young researcher at the Millenium Institute on Foundational Research on Data (IMFD). He received his D.Phil degree from the University of Oxford in 2013. Previously, he did his undergraduate studies at PUC Chile. His research interests are in database theory and data management systems, specifically, in data stream management systems, information extraction, and graph data.*

PODS Best Student Paper Award

"On the Enumeration Complexity of Unions of Conjunctive Queries" by Nofar Carmeli, Markus Kröll.

Abstract. We study the enumeration complexity of Unions of Conjunctive Queries (UCQs). We aim to identify the UCQs that are tractable in the sense that the answer tuples can be enumerated with a linear preprocessing phase and a constant delay between every successive tuples. It has been established that, in the absence of self joins and under conventional complexity assumptions, the CQs that admit such an evaluation are precisely the free-connex ones. A union of tractable CQs is always tractable. We generalize the notion of free-connexity from CQs to UCQs, thus showing that some unions containing intractable CQs are, in fact, tractable. Interestingly, some unions consisting of only intractable CQs are tractable too. The question of a finding a full characterization of the tractability of UCQs remains open. Nevertheless, we prove that for several classes of queries, free-connexity fully captures the tractable UCQs.

Nofar Carmeli *is a PhD student in the Data and Knowledge group at Technion, Israel Institute of Technology, advised by Prof. Benny Kimelfeld. Her research focuses on query optimization with guarantees using enumeration techniques. Nofar completed her BSc in 2015 in the Lapidim excellence program of the Computer Science department of Technion.*

Markus Kröll *is a pre-doctoral researcher at the TU Wien. In his research he focuses on database theory and lower bounds in enumeration complexity.*

PODS Invited Tutorials

"Making Consistency Protocols Serializable" by Alan Fekete

Abstract. The tutorial is focussed on several research agendas in the past decade or so, that examine weak isolation levels, and obtain many (or all) of the benefits for application integrity, traditionally achieved by serializable concurrency control. The tutorial presents both the mechanisms and the reasoning approaches from these research works.

Alan Fekete *is Professor of Enterprise Software Systems within the School of Computer Science at the University of Sydney. His undergraduate education was at the University of Sydney, and his doctorate was earned in the mathematics department of Harvard University. Professor Fekete has been an academic at the University of Sydney since 1988, and was promoted to Professor from 2010. He has held visiting positions at Cornell, MIT, University of Washington, Microsoft Research, and University of California Berkeley. Professor Fekete's research aims to provide intellectual tools that will help software developers who work with, or who design, major infrastructure "systems" software, especially data management platforms. A particular focus has been on transaction management mechanisms. His philosophy in both teaching and research is that better software depends on a clear understanding of the behaviour (in terms of functionality and performance characteristics, etc) of each piece of the system, and knowledge of how different pieces of a system influence one another. Professor Fekete is a member of ACM and ACS, and of the IEEE Computer Society. He has been recognized as a Distinguished Scientist by ACM for "significant accomplishments in, and impact on, the computing field".*

"Algorithmic Fairness: Measures, Methods and Representations" by Suresh Venkatasubramanian

Abstract. What happens when we replace — or augment — human decision-making with algorithms? This is a simple question, but the answers now define a new field of study — a field that I call algorithmic fairness, and that spans issues of fairness, discrimination, accountability, transparency, interpretability and responsibility, and so much more. While some of the early work in the area came out of data mining and machine learning, the field is now truly transdisciplinary, with contributions from all across computer science, as well as from all disciplines that touch on aspects of society - whether it be economics, philosophy, sociology, political science, or communication. In this tutorial, I'll try to do three things: I'll survey the main questions and some of the key insights we've developed over the years. I'll explain the web of connections between the technical and the social disciplines that make up this area, and I'll point to exciting directions that remain to be explored in both technical and social dimensions. Along the way I hope to illustrate what I think are some interesting "collisions" between computer science and the social sciences, and call for a reimagining of core ideas in our field, including the very idea of how we think about data representation.

Suresh Venkatasubramanian *is a professor at the University of Utah. His background is in algorithms and computational geometry, as well as data mining and machine learning. His current research interests lie in algorithmic fairness, and more generally the problem of understanding and explaining the results of black box decision procedures. Suresh was the John and Marva Warnock Assistant Professor at the U, and has received a CAREER award from the NSF for his work in the geometry of probability, as well as a test-of-time award at ICDE 2017 for his work in privacy. His research on algorithmic fairness has received press coverage across North America and Europe, including NPR's Science Friday, NBC, and CNN, as well as in other media outlets. He is a member of the Computing Community Consortium Council of the CRA, a member of the board of the ACLU in Utah, and a member of New York City's Failure to Appear Tool (FTA) Research Advisory Council.*

Gems of PODS Event

The Gems of PODS event features topics and results in PODS that have been highly influential in the PODS community and beyond. This year's Gems of PODS will include two talks.

"Remembering the Probabilistic Analysis of Latent Semantic Indexing"
by Christos Papadimitriou

This talk will reflect on the PODS 1998 paper **"Latent Semantic Indexing: A Probabilistic Analysis"** by Christos H. Papadimitriou, Prabhakar Raghavan, Hisao Tamaki, Santosh Vempala.

Abstract. In the late 1990s, the possibility of algorithmic extraction of insight from soulless data loomed potentially important and very intriguing. I will look back at our attempt at understanding and advancing this research program in the light of two decades of blistering progress in spectral methods, machine learning, data harvesting and deep nets.

*Professor **Christos H. Papadimitriou** received his BS in Electrical Engineering from Athens Polytechnic in 1972. He has a MS in Electrical Engineering and a PhD in Electrical Engineering/Computer Science from Princeton, received in 1974 and 1976, respectively. He considers himself fundamentally a teacher, having taught at Harvard, MIT, Athens Polytechnic, Stanford, and UCSD, before joining UC Berkeley in 1996. Since 2017 he is the Donovan Family Professor of Computer Science at Columbia University in New York. He has authored several graduate textbooks, including "Computational Complexity", "Elements of the Theory of Computation", "Combinatorial Optimization: Algorithms and Complexity", and the undergraduate textbook "Algorithms", and many research papers on the theory of algorithms and complexity and its applications to Optimization, Database Theory, Control Theory, AI, Robotics, Combinatorics, the Internet, Economics and Games Theory, Evolution, Learning, and more recently the Brain. He has also written three novels: "Turing", the best-selling "Logicomix" and his latest "Independence". Professor Papadimitriou has been awarded the Knuth Prize, IEEE's John von Neumann Medal, the EATCS Award, the IEEE Computer Society Charles Babbage Award, and the Gödel Prize, as well as nine doctorates honoris causa. He is a fellow of the Association for Computer Machinery and the National Academy of Engineering, and a member of the National Academy of Sciences of the USA and of the American Academy of Arts and Sciences.*

"Database Repairs and Consistent Query Answering: Origins and Further Developments" by Leopoldo Bertossi

This talk will reflect on the PODS 1999 paper **"Consistent Query Answers in Inconsistent Databases"** by Marcelo Arenas, Leopoldo E. Bertossi, Jan Chomicki.

Abstract. In this talk I will review the main concepts around database repairs and consistent query answering, with emphasis on tracing back the origin, motivation, and early developments. I will also describe some research directions that has spun from those main concepts and the original line of research. I will emphasize, in particular, fruitful and recent connections between repairs and causality in databases.

Leopoldo Bertossi *has been Full Professor at the School of Computer Science, Carleton University (Ottawa, Canada) from 2001 to 2019, from which he is retiring this year. In September 2019 he will take up a full-professorship at Universidad Adolfo Ibanez (UAI, Chile), the oldest and most prestigious fully-private university in Chile. He is a Senior Computer Scientist at RelationalAI Inc., since August 2018. He is also, since 2019, a senior member of the "Millenium Research Institute for Foundations of Data" (IMFD, Chile). Until 2001 he was professor at the Department of Computer Science, School of Engineering of the Catholic University of Chile (PUC), and departmental chair (1993-1995). He was the President of the Chilean Computer Science Society (SCCC) in 1996 and 1999-2000. He obtained a PhD in Mathematics from the Pontifical Catholic University of Chile (PUC) in 1988, with a PhD thesis on mathematical logic (model theory) under the supervision of Prof. Joerg Flum (University of Freiburg, Germany). He has been visiting professor and researcher at several universities, among them: University of Toronto (1989/90); Wisconsin-Milwaukee (1990/91); Marseille-Luminy (1997), Technical University Berlin (1997/98); Free University of Bolzano-Bozen, Italy (1995); University of Calabria (2014); Technical University of Vienna (2006 and 2017, as a Pauli Fellow of the "Wolfgang Pauli Institute (WPI) Vienna"). Prof. Bertossi's research interests include data science, database theory, data management, business intelligence, knowledge representation, uncertain reasoning, logic programming, computational logic, and statistical relational learning.*

Phokion Kolaitis Special Event

An event in honor of Phokion Kolaitis will take place on Sunday 30 June (please consult the schedule for room and the exact time). We will celebrate Phokion for his fundamental contributions of lasting value to the principles of database systems and computational logic, as well as to mathematical logic and computer science at large. The event comprises talks by some of his closest collaborators.

Phokion Kolaitis *is a Distinguished Professor at UC Santa Cruz and a Principal Research Staff Member at the IBM Almaden Research Center. His research interests include principles of database systems, logic in computer science, and computational complexty. Kolaitis is a Fellow of the American Association for the Advancement of Science (AAAS), a Fellow of the Association for Computing Machinery (ACM), a Foreign Member of the Finnish Academy of Science and Letters, a Foreign Member of Academia Europaea, and the recipient of a 1993 Guggenheim Fellowship. He is also the recipient of two IBM Research Division Outstanding Innovation Awards, an IBM Research Division Outstanding Technical Achievement Award, a co-winner of both the 2008 and the 2014 ACM PODS Alberto O. Mendelzon Test-of-Time Award, and a co-winner of the 2013 International Conference on Database Theory Test-of-Time Award. In 2014, Kolaitis was awarded an Honorary Doctorate Degree (Doctor Honoris Causa) from the National and Kapodistrian University of Athens, Greece.*

Scheduled Talks

– **"Welcome and introduction"** by Georg Gottlob & Wang-Chiew Tan.
– **"The logical approach to constraint satisfaction"** by Moshe Y. Vardi, Rice University.
– **"Data exchange and beyond: What I've learned from logicians"** by Renée J. Miller, Northeastern University.
– **"Containment of conjunctive queries with inequalities"** by Foto Afrati, National Technical University of Athens.
– **"Learning database queries and schema mappings"** by Balder ten Cate, Google.

– **“Computational social choice through the lens of databases”** by Benny Kimelfeld, Technion.
– **“Enumerating repairs”** by Reinhard Pichler, Vienna University of Technology (TU Wien).
– **“Generalized quantifiers, games and dependence logic”** by Jouko Väänänen, University of Helsinki.
– **“Phokion Kolaitis: My office mate for five years, collaborator, mentor and friend”** by Lefteris Kirousis, National & Kapodistrian University of Athens.

Keynotes

PODS Keynote: Cynthia Dwork (Harvard University)

"Differential Privacy and the US Census"

Abstract. Differential privacy is a mathematically rigorous definition of privacy tailored to statistical analysis of large datasets. Differentially private systems simultaneously provide useful statistics to the well-intentioned data analyst and strong protection against arbitrarily powerful adversarial system users – without needing to distinguish between the two. Differentially private systems 'don't care' what the adversary knows, now or in the future. Finally, differentially private systems can rigorously bound and control the cumulative privacy loss that accrues over many interactions with the confidential data. These unique properties, together with the abundance of auxiliary data sources and the ease with which they can be deployed by a privacy adversary, led the US Census Bureau to adopt differential privacy as the disclosure avoidance methodology of the 2020 decennial census. This talk will motivate the definition of differential privacy, reflect on the theory-meets-practice experiences of the decennial census, and highlight a few pressing challenges in the field.

***Cynthia Dwork**, the Gordon McKay Professor of Computer Science at the John A. Paulson School of Engineering and Applied Sciences at Harvard, the Radcliffe Alumnae Professor at the Radcliffe Institute for Advanced Study, Affiliated Faculty Member at Harvard Law School, and Distinguished Scientist at Microsoft Research, is renowned for placing privacy-preserving data analysis on a mathematically rigorous foundation. She has also made seminal contributions in distributed computing and cryptography. Her current focus is on developing the theory of algorithmic fairness. Dwork is a member of the US National Academy of Sciences, the US National Academy of Engineering, and the American Philosophical Society, and is a Fellow of the American Academy of Arts and Sciences and of the ACM.*

SIGMOD Keynote 1: Lise Getoor (UC Santa Cruz)

"Responsible Data Science"

Abstract. Data science is an emerging discipline that offers both promise and peril. Responsible data science refers to efforts that address both the technical and societal issues in emerging data-driven technologies. How can machine learning and database systems reason effectively about complex dependencies and uncertainty? Furthermore, how do we understand the ethical and societal issues involved in data-driven decision-making? There is a pressing need to integrate algorithmic and statistical principles, social science theories, and basic humanist concepts so that we can think critically and constructively about the socio-technical systems we are building. In this talk, I will overview this emerging area, with an emphasis on relational learning.

Lise Getoor *is a professor in the Computer Science Department at UC Santa Cruz and founding director of the Data, Discovery and Decisions (D3) Data Science Research Center at the University of California, Santa. Cruz. Her research areas include machine learning, data integration and reasoning under uncertainty, with an emphasis on graph and network data. She has over 250 publications, including 13 best paper awards. She is a Fellow of the Association for Artificial Intelligence, has served as an elected board member of the International Machine Learning Society and the Computing Research Association (CRA). In fall 2018, she was a visiting researcher in the Fairness, Accountability, Transparency and Ethics research group at Microsoft Research, NYC. She received her PhD from Stanford University in 2001, her MS from UC Berkeley, and her BS from UC Santa Barbara, and was a professor at the University of Maryland, College Park from 2001-2013.*

SIGMOD Keynote 2: C. Mohan (IBM Almaden)

"State of Public and Private Blockchains: Myths and Reality"

Abstract. It has been a decade since the concept of blockchain was invented as the underlying core data structure of the permissionless or public Bitcoin cryptocurrency network. Since then, several cryptocurrencies, tokens and ICOs have emerged. After much speculation and hype, significant number of them have become problematic or worthless! The public blockchain system Ethereum emerged by generalizing the use of blockchains to manage any kind of asset, be it physical or purely digital, with the introduction of Smart Contracts. Over the years, numerous myths have developed with respect to the purported utility and the need for public blockchains. The adoption and further adaptation of blockchains and smart contracts for use in the permissioned or private environments is what I consider to be useful and of practical consequence. Hence, the technical aspects of only private blockchain systems will be the focus of my SIGMOD 2019 keynote. Along the way, I will bust many myths associated with public blockchains. I will also compare traditional database technologies with blockchain systems' features and identify desirable future research topics.

Dr. C. Mohan *is currently an IBM Fellow at the IBM Almaden Research Center in Silicon Valley and a Distinguished Visiting Professor at Tsinghua University in China. He has been an IBM researcher for 37 years in the database and related areas, impacting numerous IBM and non-IBM products, the research and academic communities, and standards, especially with his invention of the well-known ARIES family of database locking and recovery algorithms, and the Presumed Abort distributed commit protocol. This IBM (1997), ACM (2002) and IEEE (2002) Fellow has also served as the IBM India Chief Scientist (2006-2009). In addition to receiving the ACM SIGMOD Innovations Award (1996), the VLDB 10 Year Best Paper Award (1999) and numerous IBM awards, Mohan was elected to the US and Indian National Academies of Engineering (2009) and named an IBM Master Inventor (1997). This Distinguished Alumnus of IIT Madras (1977) received his PhD at the University of Texas at Austin (1981). He is an inventor of 50 patents. He is currently focused on Blockchain, Big Data and HTAP technologies (http://bit.ly/CMbcDB, http://bit.ly/CMgMDS). For 2 years, he has been an evangelist for private blockchains and the myth buster of public blockchains. Since 2016, Mohan has been a Distinguished Visiting Professor of China's prestigious Tsinghua University. He has served on the advisory board of IEEE Spectrum, and on numerous conference and journal boards. Mohan is a frequent speaker in North America, Europe and Asia, and has given talks in 40 countries. He is very active on social media and has a huge network of followers.*

Schedule at a Glance

Sunday, June 30, 2019: Workshops & Tutorials

time \ room	Effectenbeurszaal	Grote zaal: Berlage zaal	Grote zaal: Administratiezaal	Grote zaal: Veilingzaal	Verwey kamer
08:00 - 08:30	*coffee*				
08:30 - 09:00					
09:00 - 09:30 09:30 - 10:00 10:00 - **10:30**	**Tutorial 3**	**DEEM**	**GRADES-NDA**	**Tutorial 1**	**DSMM**
10:30 - **11:00**	*coffee*				
11:00 - 11:30 11:30 - 12:00 12:00 - **12:30**	**Tutorial 3**	**DEEM**	**GRADES-NDA**	**Tutorial 1**	**DSMM**
12:30 - 13:00 13:00 - 13:30 13:30 - **14:00**	*lunch*				
14:00 - 14:30 14:30 - 15:00 15:00 - **15:30**	**Phokion Kolaitis event**	**DEEM**	**GRADES-NDA**	**Tutorial 2**	**DSMM**
15:30 - 16:00	*coffee* + ***Workshop Posters***				
16:00 - **16:30**	**Phokion Kolaitis event**				
16:30 - 17:00 17:00 - 17:30 17:30 - **18:00**		**DEEM**	**GRADES-NDA**	**Tutorial 2**	**DSMM**
18:00 - **18:15**					
18:15 - 18:30 18:30 - 19:00 19:00 - **19:45**	***PODS reception***				
19:45 - 20:30					
20:30 - 21:00	Tutorial 3: *Database and Distributed Computing Foundations of Blockchains*				
21:00 - 22:00	Tutorial 1: *Towards Democratizing Relational Data Visualizations*				
22:00 - 23:00	Tutorial 2: *Exploring the Data Wilderness through Examples*				

Monday, July 1, 2019: PODS & DaMoN		
room / time	Grote zaal	
	Effectenbeurszaal	Berlage zaal
08:00 - 08:30	*coffee*	
08:30 - 09:00 09:00 - 09:30 09:30 **- 10:00**	**PODS Opening & Keynote** *Differential Privacy and the US Census* Cynthia Dwork	
10:00 - 10:30 10:30 **- 11:00**	**PODS 1** *Incomplete Information*	**DaMoN**
11:00 - 11:30	*coffee*	
11:30 - 12:00 12:00 - 12:30 12:30 **- 13:00**	**PODS** ***Test of Time Award*** ***Gems of PODS***	**DaMoN**
13:00 - 13:30 13:30 - 14:00 14:00 **- 14:30**	*lunch* ***+ Posters:*** ***SRC, PODS, DaMoN***	
14:30 - 15:00 15:00 - 15:30 15:30 - 16:00 16:00 **- 16:30**	**PODS 2** *Enumeration and Counting*	**DaMoN**
16:30 - 17:00	*coffee*	
17:00 - 17:30 17:30 **- 18:00**	**PODS 3** *Information Extraction, Hashing, and Privacy*	**DaMoN**
18:00 - 18:30 18:30 **- 19:00**	**PODS business meeting**	
19:00 - 19:30 19:30 - 20:00 20:00 - 20:30 20:30 - 21:00 21:00 - 22:00 22:00 - 23:00		

Tuesday, July 2, 2019: SIGMOD & PODS

time \ room	Grote zaal				
	Effectenbeurszaal	Graanbeurszaal	Administratiezaal	Berlage zaal	Veilingzaal
08:00 - 08:30	*coffee*				
08:30 - 08:50	**SIGMOD Welcome & Opening**				
08:50 - 09:20 09:20 - 09:50 09:50 - 10:20	**SIGMOD Keynote 1** *Responsible Data Science* Lise Getoor				
10:20 - **11:00**	**Tuesday SIGMOD & TODS Teaser Talks**				
11:00 - 11:30	*coffee*				
11:30 - 12:00 12:00 - 12:30 12:30 - **12:50**	**SIGMOD Panel** on *Data Ethics*				**PODS 4** *Streams*
12:50 - 13:20 13:20 - 13:50 13:50 - **14:20**	*lunch* + ***Awards Announcements***				
14:20 - 14:50 14:50 - 15:20 15:20 - 15:50 15:50 - **16:20**	**Research 1** *Query Processing & Optimization 1* Sponsor: tableau	**Research 2** *Privacy / Blockchain*	**Research 3** *Information Extraction*	**Industry 1** *Data Applications*	**PODS Tutorial 1** *Making Consistency Protocols Serializ-able*
16:20 - 16:50 16:50 - 17:20 **17:20 - 17:50**	**Demos A, B & Programming Contest** **Tuesday Posters & TODS Posters** (*incl. Coffee & Drinks*)				
17:50 - 18:20 18:20 - 19:00 19:00 - 19:30 19:30 - **19:50**	**New Researchers Symposium (NRS)**	**Student Research Competition (SRC)**			**PODS 5** *Semistructured Data & Knowledge Graphs, Logic, & Verification*
19:50 - 20:30					
20:30 - 21:00 21:00 - 22:00 22:00 - **23:00**	***SIGMOD reception @ Van Gogh Museum*** *(Museum Plein, Amsterdam)*			*Sponsored by* monetdb	

Wednesday, July 3, 2019: SIGMOD & PODS

time \ room	Grote zaal				
	Effectenbeurszaal	Graanbeurszaal	Administratiezaal	Berlage zaal	Veilingzaal
08:00 - 08:30	*coffee*				
08:30 - 09:00 09:00 - 09:30 09:30 - 10:00	**SIGMOD Keynote 2** *State of Public and Private Blockchains: Myths and Reality* C. Mohan				
10:00 - 10:30 10:30 **- 11:00**	**Wednesday SIGMOD Teaser Talks**				**PODS 6** *Containment & Homomorphisms*
11:00 - 11:30	*coffee*				
11:30 - 12:00 12:00 - 12:30 12:30 **- 12:50**	**Research 4** *Distributed Data Management*	**Research 5** *Provenance*	**Research 6** *Streams*	**Industry 2** *Storage and Indexing*	**PODS 7** *Joins, Hypergraphs, & Aggregate Queries*
12:50 - 13:20 13:20 - 13:50 13:50 **- 14:20**	*lunch* **+** ***SIGMOD Business meeting***				
14:20 - 14:50 14:50 - 15:20 15:20 - 15:50 15:50 **- 16:20**	**Research 7** *Modern Hardware*	**Research 8** *Data Integration / Cleaning*	**Research 9** *Query Processing & Optimization 2*	**Research 10** *Graphs 1*	**PODS Tutorial 2** *Algorithmic Fairness: Measures, Methods and Representations*
16:20 - 16:50 16:50 - 17:20 17:20 **- 17:50**	**Demos B & C + Wednesday Posters** *(incl. Coffee & Drinks)*				
17:50 - 18:20 18:20 - 19:00 19:00 - 19:30 19:30 - 20:00 20:00 **- 20:30**	**"Pipelined" / "staggered" boat transfer to Dinner** ***(incl. Canal cruise)***				
20:30 - 21:00 21:00 - 22:00 22:00 **- 23:00**	***Dinner @ Noorderlicht Cafe*** *(NDSM Plein, Amsterdam Noord)*			*Sponsored by* facebook	

Thursday, July 4, 2019: SIGMOD

time \ *room*	*Grote zaal*			
	Effectenbeurszaal	Graanbeurszaal	Administratiezaal	Berlage zaal
08:00 - 08:30	*coffee*			
08:30 - 09:00 09:00 - 09:30 09:30 - 10:00 10:00 - 10:30 10:30 **- 11:00**	**SIGMOD Award Talks** **Thursday SIGMOD Teaser Talks**			
11:00 - 11:30	*coffee*			
11:30 - 12:00 12:00 - 12:30 12:30 **- 12:50**	**Research 11** *Systems & Machine Learning*	**Research 12** *Indexing*	**Research 13** *Fairness, Uncertainty*	**Research 14** *Graphs 2*
12:50 - 13:20 13:20 - 13:50 13:50 **- 14:20**	*lunch*			
14:20 - 14:50 14:50 - 15:20 15:20 - 15:50 15:50 **- 16:20**	**Research 15** *Graphs 3*	**Research 16** *Machine Learning*	**Research 17** *Scalability*	**Industry 3** *Data Platforms*
16:20 - 16:50 16:50 - 17:30 **17:30 - 17:50**	**Demos C & A** **Thursday Posters**		*(incl. Coffee & Drinks)*	
17:50 **- 18:00**		*ADS reception*		
18:00 - 18:30 18:30 - 19:00 19:00 **- 19:30**	**ADS event**	*sponsored by* ELSEVIER		
19:30 - 20:00		*ADS reception*		
20:00 - 21:00 21:00 - 22:00 22:00 - 23:00				

ADS: Amsterdam Data Science (https://amsterdamdatascience.nl/)

Friday, July 5, 2019: Workshops & Tutorials

time \ room	Grote zaal				
	Effectenbeurszaal	Berlage zaal	Administratiezaal	Veilingzaal	Verwey kamer
08:00 - 08:30					
08:30 - 09:00	*coffee*				
09:00 - 09:30 09:30 - 10:00 10:00 **- 10:30**	**Tutorial 6**	**HILDA**	**aiDM**	**SBD**	**Tutorial 4**
10:30 - 11:00	*coffee*				
11:00 - 11:30 11:30 - 12:00 12:00 **- 12:30**	**Tutorial 6**	**HILDA**	**aiDM**	**SBD**	**Tutorial 4**
12:30 - 13:00 13:00 - 13:30 13:30 **- 14:00**	*lunch*				
14:00 - 14:30 14:30 - 15:00 15:00 **- 15:30**	**Tutorial 7**	**HILDA**	**aiDM**	**SBD**	**Tutorial 5**
15:30 - 16:00 16:00 **- 16:30**	*coffee*			**+ *Workshop Posters***	
16:30 - 17:00 17:00 - 17:30 17:30 **- 18:00**		**HILDA**	**aiDM**	**SBD**	**Tutorial 5**
18:00 - 18:30 18:30 - 19:00 19:00 - 19:30					
19:30 - 20:00	Tutorial 4:	*Classical and Contemporary Approaches to Big Time Series Forecasting*			
20:00 - 20:30 20:30 - 21:00	Tutorial 6:	*From Auto Tuning One Size Fits All to Self-designed and Learned Data Intensive Systems*			
21:00 - 22:00	Tutorial 7:	*Schemas and Types for JSON Data: From Theory to Practice*			
22:00 - 23:00	Tutorial 5:	*Data Pipelines for User Group Analytics*			

Detailed Schedule

Sunday 06/30 08:00-09:00

Coffee + Light Breakfast

Room: Grote Zaal **Time**: Sunday 08:00-09:00

Sunday 06/30 08:30-10:30

GRADES-NDA 2019: Session 1

Room: Administratiezaal **Time**: Sunday 08:30-10:30

GRADES-NDA 2019: Joint International Workshop on Graph Data Management Experiences & Systems and Network Data Analytics
Akhil Arora (EPFL), Arnab Bhattacharya (IIT Kanpur), George Fletcher (TU Eindhoven)

Sunday 06/30 09:00-10:30

Tutorial 1: part 1

Room: Veilingzaal **Time**: Sunday 09:00-10:30

Towards Democratizing Relational Data Visualization
Nan Tang (Qatar Foundation), Eugene Wu (Columbia University), Guoliang Li (Tsinghua University)

DEEM 2019: Session 1

Room: Berlage Zaal **Time**: Sunday 09:00-10:30

DEEM 2019: Workshop on Data Management for End-to-End Machine Learning
Sebastian Schelter (New York University), Neoklis Polyzotis (Google), Manasi Vartak (Massachusetts Institute of Technology), Stephan Seufert (Amazon Research)

Tutorial 3: part 1

Room: Effectenbeurszaal **Time**: Sunday 09:00-10:30

Database and Distributed Computing Foundations of Blockchains
Sujaya Maiyya (University of California, Santa Barbara), Victor Zakhary (University of California, Santa Barbara), Mohammad Javad Amiri (University of California, Santa Barbara), Divyakant Agrawal (University of California, Santa Barbara), Amr El Abbadi (University of California, Santa Barbara)

DSMM 2019: Session 1

Room: Verwey Kamer **Time**: Sunday 09:00-10:30

DSMM 2019: the 5th Workshop on Data Science for Macro-modeling with Financial and Economic Datasets
Douglas Burdick (IBM Almaden Research Center), Rajasekar Krishnamurthy (IBM T. J. Watson Research Center), Louiqa Raschid (University of Maryland)

Sunday 06/30 10:30-11:00

Coffee

Room: Grote Zaal **Time**: Sunday 10:30-11:00

Sunday 06/30 11:00-12:30

Tutorial 1: part 2

Room: Veilingzaal **Time**: Sunday 11:00-12:30

Towards Democratizing Relational Data Visualization
Nan Tang (Qatar Foundation), Eugene Wu (Columbia University), Guoliang Li (Tsinghua University)

GRADES-NDA 2019: Session 2

Room: Administratiezaal **Time**: Sunday 11:00-12:30

GRADES-NDA 2019: Joint International Workshop on Graph Data Management Experiences & Systems and Network Data Analytics
Akhil Arora (EPFL), Arnab Bhattacharya (IIT Kanpur), George Fletcher (TU Eindhoven)

DEEM 2019: Session 2

Room: Berlage Zaal **Time**: Sunday 11:00-12:30

DEEM 2019: Workshop on Data Management for End-to-End Machine Learning

Sebastian Schelter (New York University), Neoklis Polyzotis (Google), Manasi Vartak (Massachusetts Institute of Technology), Stephan Seufert (Amazon Research)

Tutorial 3: part 2

Room: Effectenbeurszaal **Time**: Sunday 11:00-12:30

Database and Distributed Computing Foundations of Blockchains

Sujaya Maiyya (University of California, Santa Barbara), Victor Zakhary (University of California, Santa Barbara), Mohammad Javad Amiri (University of California, Santa Barbara), Divyakant Agrawal (University of California, Santa Barbara), Amr El Abbadi (University of California, Santa Barbara)

DSMM 2019: Session 2

Room: Verwey Kamer **Time**: Sunday 11:00-12:30

DSMM 2019: the 5th Workshop on Data Science for Macro-modeling with Financial and Economic Datasets

Douglas Burdick (IBM Almaden Research Center), Rajasekar Krishnamurthy (IBM T. J. Watson Research Center), Louiqa Raschid (University of Maryland)

Sunday 06/30 12:30-14:00

Lunch

Room: Grote Zaal **Time**: Sunday 12:30-14:00

Sunday 06/30 14:00-15:30

Tutorial 2: part 1

Room: Veilingzaal **Time**: Sunday 14:00-15:30

Exploring the Data Wilderness through Examples

Davide Mottin (Aarhus University), Matteo Lissandrini (Aalborg University), Yannis Velegrakis (Utrecht University), Themis Palpanas (Paris Descartes University)

GRADES-NDA 2019: Session 3

Room: Administratiezaal **Time**: Sunday 14:00-15:30

GRADES-NDA 2019: Joint International Workshop on Graph Data Management Experiences & Systems and Network Data Analytics

Akhil Arora (EPFL), Arnab Bhattacharya (IIT Kanpur), George Fletcher (TU Eindhoven)

DEEM 2019: Session 3

Room: Berlage Zaal **Time**: Sunday 14:00-15:30

DEEM 2019: Workshop on Data Management for End-to-End Machine Learning

Sebastian Schelter (New York University), Neoklis Polyzotis (Google), Manasi Vartak (Massachusetts Institute of Technology), Stephan Seufert (Amazon Research)

Phokion Kolaitis Special Event: part 1

Room: Effectenbeurszaal **Time**: Sunday 14:00-15:30

Phokion Kolaitis Special Event

Georg Gottlob (University of Oxford), Wang-Chiew Tan (Megagon Labs)

DSMM 2019: Session 3

Room: Verwey Kamer **Time**: Sunday 14:00-15:30

DSMM 2019: the 5th Workshop on Data Science for Macro-modeling with Financial and Economic Datasets

Douglas Burdick (IBM Almaden Research Center), Rajasekar Krishnamurthy (IBM T. J. Watson Research Center), Louiqa Raschid (University of Maryland)

Sunday 06/30 15:30-16:30

Coffee + Workshop Posters

Room: Grote Zaal **Time**: Sunday 15:30-16:30

Sunday 06/30 16:30-18:00

Tutorial 2: part 2

Room: Veilingzaal **Time**: Sunday 16:30-18:00

Exploring the Data Wilderness through Examples
Davide Mottin (Aarhus University), Matteo Lissandrini (Aalborg University), Yannis Velegrakis (Utrecht University), Themis Palpanas (Paris Descartes University)

GRADES-NDA 2019: Session 4

Room: Administratiezaal **Time**: Sunday 16:30-18:00

GRADES-NDA 2019: Joint International Workshop on Graph Data Management Experiences & Systems and Network Data Analytics
Akhil Arora (EPFL), Arnab Bhattacharya (IIT Kanpur), George Fletcher (TU Eindhoven)

DEEM 2019: Session 4

Room: Berlage Zaal **Time**: Sunday 16:30-18:00

DEEM 2019: Workshop on Data Management for End-to-End Machine Learning
Sebastian Schelter (New York University), Neoklis Polyzotis (Google), Manasi Vartak (Massachusetts Institute of Technology), Stephan Seufert (Amazon Research)

Phokion Kolaitis Special Event: part 2 (16:00-18:15)

Room: Effectenbeurszaal **Time**: Sunday 16:30-18:00

Phokion Kolaitis Special Event
Georg Gottlob (University of Oxford), Wang-Chiew Tan (Megagon Labs)

DSMM 2019: Session 4

Room: Verwey Kamer **Time**: Sunday 16:30-18:00

DSMM 2019: the 5th Workshop on Data Science for Macro-modeling with Financial and Economic Datasets
Douglas Burdick (IBM Almaden Research Center), Rajasekar Krishnamurthy (IBM T. J. Watson Research Center), Louiqa Raschid (University of Maryland)

Sunday 06/30 18:15-19:45

PODS Reception

Room: Grote Zaal **Time**: Sunday 18:15-19:45

Monday 01/07 08:00-08:30

Coffee + Light Breakfast

Room: Grote Zaal **Time**: Monday 08:00-08:30

Monday 01/07 08:30-10:00

PODS Opening & Keynote

Room: Effectenbeurszaal **Time**: Monday 08:30-10:00
Chair: Christoph Koch

Differential Privacy and the US Census
Cynthia Dwork (Harvard University)

Monday 01/07 10:00-11:00

PODS 1: Incomplete Information

Room: Effectenbeurszaal **Time**: Monday 10:00-11:00
Chair: Pierre Senellart

Regularizing Conjunctive Features for Classification
Pablo Barceló (University of Chile & IMFD Chile), Alexander Baumgartner (University of Chile & RISC, Johannes Kepler University), Victor Dalmau (Universitat Pompeu Fabra), Benny Kimelfeld (Technion)

Probabilistic Databases with an Infinite Open-World Assumption
Martin Grohe (RWTH Aachen University), Peter Lindner (RWTH Aachen University)

Query Evaluation in Election Databases
Benny Kimelfeld (Technion), Phokion Kolaitis (University of California, Santa Cruz & IBM Research-Almaden), Muhammad Tibi (Technion)

DaMoN 2019: Session 1

Room: Graanbeurs **Time**: Monday 10:00-11:00

DaMoN 2019: the 15th International Workshop on Data Management on New Hardware
Thomas Neumann (Technische Universität München), Ken Salem (University of Waterloo)

Monday 01/07 11:00-11:30

Coffee

Room: Grote Zaal **Time**: Monday 11:00-11:30

Monday 01/07 11:30-13:00

Gems of PODS and Test-of-Time Award

Room: Effectenbeurszaal **Time**: Monday 11:30-13:00
Chair: Benny Kimelfeld

A General Datalog-based Framework for Tractable Query Answering
Andrea Cali (Birkbeck College), Georg Gottlob (University of Oxford), Thomas Lukasiewicz (University of Oxford)

Database Repairs and Consistent Query Answering: Origins and Further Developments
Leopoldo Bertossi (RelationalAI & Carleton University)

Remembering the Probabilistic Analysis of Latent Semantic Indexing
Christos Papadimitriou (Columbia University)

DaMoN 2019: Session 2

Room: Graanbeurs **Time**: Monday 11:30-13:00

DaMoN 2019: the 15th International Workshop on Data Management on New Hardware
Thomas Neumann (Technische Universität München), Ken Salem (University of Waterloo)

Monday 01/07 13:00-14:30

Lunch + Posters (PODS, DaMoN, SIGMOD Student Research Competition)

Room: Grote Zaal **Time**: Monday 13:00-14:30

Monday 01/07 14:30-16:30

PODS 2: Enumeration and Counting

Room: Effectenbeurszaal **Time**: Monday 14:30-16:30
Chair: Dirk van Gucht

Efficient Logspace Classes for Enumeration, Counting, and Uniform Generation
Marcelo Arenas (PUC & IMFD Chile), Luis Alberto Croquevielle (PUC & IMFD Chile), Rajesh Jayaram (Carnegie Mellon University), Cristian Riveros (PUC & IMFD Chile)

Ranked Enumeration of Minimal Triangulations
Noam Ravid (Technion), Dori Medini (Technion), Benny Kimelfeld (Technion)

Enumeration on Trees with Tractable Combined Complexity and Efficient Updates
Antoine Amarilli (LTCI, CNRS, Télécom ParisTech, Université Paris-Saclay), Pierre Bourhis (CRIStAL, CNRS UMR 9189, Inria Lille), Stefan Mengel (CNRS, CRIL UMR 8188), Matthias Niewerth (University of Bayreuth)

Counting Database Repairs under Primary Keys Revisited
Marco Calautti (University of Edinburgh), Marco Console (University of Edinburgh), Andreas Pieris (University of Edinburgh)

The Complexity of Counting Cycles in the Adjacency List Streaming Model
John Kallaugher (University of Texas at Austin), Andrew McGregor (University of Massachusetts Amherst), Eric Price (University of Texas at Austin), Sofya Vorotnikova (University of Massachusetts Amherst)

On the Enumeration Complexity of Unions of Conjunctive Queries
Nofar Carmeli (Technion), Markus Kröll (TU Wien)

DaMoN 2019: Session 3

Room: Graanbeurs **Time**: Monday 14:30-16:30

DaMoN 2019: the 15th International Workshop on Data Management on New Hardware
Thomas Neumann (Technische Universität München), Ken Salem (University of Waterloo)

Monday 01/07 16:30-17:00

Coffee

Room: Grote Zaal **Time**: Monday 16:30-17:00

Monday 01/07 17:00-18:00

PODS 3: Information Extraction, Hashing, and Privacy

Room: Effectenbeurszaal **Time**: Monday 17:00-18:00
Chair: Yufei Tao

Split-Correctness in Information Extraction
Johannes Doleschal (University of Bayreuth & Hasselt University), Benny Kimelfeld (Technion), Wim Martens (University of Bayreuth), Yoav Nahshon (Technion), Frank Neven (Hasselt University & Transnational University of Limburg)

Robust Set Reconciliation via Locality Sensitive Hashing
Michael Mitzenmacher (Harvard University), Tom Morgan (Harvard University & Google)

What Storage Access Privacy is Achievable with Small Overhead?
Sarvar Patel (Google), Giuseppe Persiano (Google & University of Salerno), Kevin Yeo (Google)

DaMoN 2019: Session 4

Room: Graanbeurs **Time**: Monday 17:00-18:00

DaMoN 2019: the 15th International Workshop on Data Management on New Hardware
Thomas Neumann (Technische Universität München), Ken Salem (University of Waterloo)

Monday 01/07 18:00-19:00

PODS Business Meeting

Room: Effectenbeurszaal **Time**: Monday 18:00-19:00

DaMoN 2019: Session 4 (uninterrupted from 17:00)

Room: Graanbeurs **Time**: Monday 18:00-19:00

DaMoN 2019: the 15th International Workshop on Data Management on New Hardware

Thomas Neumann (Technische Universität München), Ken Salem (University of Waterloo)

Tuesday 02/07 08:00-08:30

Coffee + Light Breakfast

Room: Grote Zaal **Time**: Tuesday 08:00-08:30

Tuesday 02/07 08:30-10:20

SIGMOD Welcome + Keynote

Room: Effectenbeurszaal **Time**: Tuesday 08:30-10:20
Chair: Peter Boncz

Responsible Data Science

Lise Getoor (University of California, Santa Cruz)

Tuesday 02/07 10:20-11:00

Teaser Talks for all Tuesday SIGMOD Research, Industrial Papers and TODS Posters

Room: Effectenbeurszaal **Time**: Tuesday 10:20-11:00
Chair: Peter Boncz

Tuesday 02/07 11:00-11:30

Coffee

Room: Grote Zaal **Time**: Tuesday 11:00-11:30

Tuesday 02/07 11:30-12:50

SIGMOD Panel on Data Ethics

Room: Effectenbeurszaal **Time**: Tuesday 11:30-12:50
Chair: H.V. Jagadish

The Responsibility Challenge for Data
H. V. Jagadish (University of Michigan), Francesco Bonchi (ISI Foundation), Tina Eliassi-Rad (Northeastern University), Lise Getoor (University of California, Santa Cruz), Krishna Gummadi (Max Planck Institute for Software Systems), Julia Stoyanovich (New York University)

PODS 4: Streams

Room: Veilingzaal **Time**: Tuesday 11:30-12:50
Chair: Pablo Barceló

Tight Trade-offs for the Maximum k-Coverage Problem in the General Streaming Model
Piotr Indyk (MIT), Ali Vakilian (MIT)

Weighted Reservoir Sampling from Distributed Streams
Rajesh Jayaram (Carnegie Mellon University), Gokarna Sharma (Kent State University), Srikanta Tirthapura (Iowa State University), David Woodruff (Carnegie Mellon University)

Distributed and Streaming Linear Programming in Low Dimensions
Sepehr Assadi (Princeton University), Nikolai Karpov (Indiana University), Qin Zhang (Indiana University)

Better Sliding Window Algorithms to Maximize Subadditive and Diversity Objectives
Michele Borassi (Google Research), Alessandro Epasto (Google Research), Silvio Lattanzi (Google Research), Sergei Vassilvitskii (Google Research), Morteza Zadimoghaddam (Google Research)

Tuesday 02/07 12:50-14:20

Lunch + SIGMOD Awards

Room: Grote Zaal **Time**: Tuesday 12:50-14:20

Tuesday 02/07 14:20-16:20

SIGMOD Research 1: Query Processing & Optimization 1 - sponsored by Tableau

Room: Effectenbeurszaal **Time**: Tuesday 14:20-16:20
Chair: Wolfgang Lehner

Exact Cardinality Query Optimization with Bounded Execution Cost
Immanuel Trummer (Cornell University)

Pessimistic Cardinality Estimation
Walter Cai (University of Washington), Magdalena Balazinska (University of Washington), Dan Suciu (University of Washington)

Efficiently Searching In-Memory Sorted Arrays: Revenge of the Interpolation Search?
Peter Van Sandt (University of Wisconsin, Madison), Yannis Chronis (University of Wisconsin, Madison), Jignesh Patel (University of Wisconsin, Madison)

Iterative Query Processing based on Unified Optimization Techniques
Kisung Park (Kyung Hee University), Hojin Seo (Kyung Hee University), Mostofa Rasel (Kyung Hee University), Young-Koo Lee (Kyung Hee University), Chanho Jeong (SAP Labs Korea), Sung Yeol Lee (SAP Labs Korea), Chungmin Lee (SAP Labs Korea), Dong-Hun Lee (SAP Labs Korea)

Approximate Distinct Counts for Billions of Datasets
Daniel Ting (Tableau Software)

Cache-oblivious High-performance Similarity Join
Martin Perdacher (University of Vienna), Claudia Plant (University of Vienna), Christian Böhm (Ludwig-Maximilians-Universität)

SIGMOD Research 2: Privacy/Blockchain

Room: Graanbeurszaal **Time**: Tuesday 14:20-16:20
Chair: Raghav Kaushik

Blurring the Lines between Blockchains and Database Systems: the Case of Hyperledger Fabric
Ankur Sharma (Saarland University), Felix Schuhknecht (Saarland University), Divya Agrawal (Saarland University), Jens Dittrich (Saarland University)

Towards Scaling Blockchain Systems via Sharding
Hung Dang (National University of Singapore), Tien Tuan Anh Dinh (National University of Singapore), Dumitrel Loghin (National University of Singapore), Ee-Chien Chang (National University of Singapore), Qian Lin (National University of Singapore), Beng Chin Ooi (National University of Singapore)

vChain: Enabling Verifiable Boolean Range Queries over Blockchain Databases
Cheng Xu (Hong Kong Baptist University), Ce Zhang (Hong Kong Baptist University), Jianliang Xu (Hong Kong Baptist University)

Answering Multi-Dimensional Analytical Queries under Local Differential Privacy
Tianhao Wang (Purdue University), Bolin Ding (Alibaba Group), Jingren Zhou (Alibaba Group), Cheng Hong (Alibaba Group), Zhicong Huang (Alibaba Group), Ninghui Li (Purdue University), Somesh Jha (University of Wisconsin, Madison)

APEx: Accuracy-Aware Differentially Private Data Exploration
Chang Ge (University of Waterloo), Xi He (University of Waterloo), Ihab Ilyas (University of Waterloo), Ashwin Machanavajjhala (Duke University)

Active Sparse Mobile Crowd Sensing Based on Matrix Completion
Kun Xie (Hunan University), Xiaocan Li (Hunan University), Xin Wang (Stony Brook University), Gaogang Xie (Institute of Computing Technology & Chinese Academy of Sciences), Jigang Wen (Institute of Computing Technology & Chinese Academy of Sciences), Dafang Zhang (Hunan University)

SIGMOD Research 3: Information Extraction

Room: Administratiezaal **Time**: Tuesday 14:20-16:20
Chair: Guoliang Li

Autocompletion for Prefix-Abbreviated Input
Sheng Hu (Nagoya University & Kyoto University), Chuan Xiao (Nagoya University & Osaka University), Jianbin Qin (Shenzhen University), Yoshiharu Ishikawa (Nagoya University), Qiang Ma (Kyoto University)

Progressive Deep Web Crawling Through Keyword Queries For Data Enrichment
Pei Wang (Simon Fraser University), Ryan Shea (Simon Fraser University), Jiannan Wang (Simon Fraser University), Eugene Wu (Columbia University)

Visual Segmentation for Information Extraction from Heterogeneous Visually Rich Documents
Ritesh Sarkhel (Ohio State University), Arnab Nandi (Ohio State University)

RRR: Rank-Regret Representative
Abolfazl Asudeh (University of Michigan), Azade Nazi (Google AI), Nan Zhang (Pennsylvania State University), Gautam Das (University of Texas at Arlington), H. V. Jagadish (University of Michigan)

Strongly Truthful Interactive Regret Minimization
Min Xie (Hong Kong University of Science and Technology), Raymond Chi-Wing Wong (Hong Kong University of Science and Technology), Ashwin Lall (Denison University)

Verifying Text Summaries of Relational Data Sets
Saehan Jo (Cornell University), Immanuel Trummer (Cornell University), Weicheng Yu (Cornell University), Xuezhi Wang (Google Research), Cong Yu (Google Research), Daniel Liu (Cornell University), Niyati Mehta (Cornell University)

SIGMOD Industry 1: Data Applications

Room: Berlage Zaal **Time**: Tuesday 14:20-16:20
Chair: Marco Serafini

QuickInsights: Quick and Automatic Discovery of Insights from Multi-Dimensional Data
Rui Ding (Microsoft Research), Shi Han (Microsoft Research), Yong Xu (Microsoft Research), Haidong Zhang (Microsoft Research), Dongmei Zhang (Microsoft Research)

ExplainIt! – A Declarative Root-cause Analysis Engine for Time Series Data
Vimalkumar Jeyakumar (Cisco Tetration Analytics), Omid Madani (Cisco Tetration Analytics), Ali Parandeh (Cisco Tetration Analytics), Ashutosh Kulshreshtha (Cisco Tetration Analytics), Weifei Zeng (Cisco Tetration Analytics), Navindra Yadav (Cisco Tetration Analytics)

Automatically Generating Interesting Facts from Wikipedia Tables
Flip Korn (Google Research), Xuezhi Wang (Google Research), You Wu (Google Research), Cong Yu (Google Research)

Snorkel DryBell: A Case Study in Deploying Weak Supervision at Industrial Scale

Stephen Bach (Brown University), Daniel Rodriguez (Google), Yintao Liu (Google), Chong Luo (Google), Haidong Shao (Google), Cassandra Xia (Google), Souvik Sen (Google), Alex Ratner (Stanford University), Braden Hancock (Stanford University), Houman Alborzi (Google), Rahul Kuchhal (Google), Chris Ré (Stanford University), Rob Malkin (Google)

PS2: Parameter Server on Spark

Zhipeng Zhang (Peking University & Tencent Inc.), Bin Cui (Peking University), Yingxia Shao (Beijing University of Posts and Telecommunications), Lele Yu (Tencent Inc.), Jiawei Jiang (Tencent Inc.), Xupeng Miao (Peking University & Tencent Inc.)

Entity Matching Meets Data Science: A Progress Report from the Magellan Project

Yash Govind (University of Wisconsin, Madison), Pradap Konda (University of Wisconsin, Madison), Paul Suganthan G.C. (Google), Philip Martinkus (University of Wisconsin, Madison), Palaniappan Nagarajan (University of Wisconsin, Madison), Aravind Soundararajan (University of Wisconsin, Madison), Han Li (University of Wisconsin, Madison), Sidharth Mudgal (University of Wisconsin, Madison), Jeff Ballard (University of Wisconsin, Madison), Haojun Zhang (University of Wisconsin, Madison), Adel Ardalan (University of Wisconsin, Madison), Sanjib Das (University of Wisconsin, Madison), Derek Paulsen (University of Wisconsin, Madison), Amanpreet Singh Saini (University of Wisconsin, Madison), Erik Paulson (University of Wisconsin, Madison), Youngchoon Park (Johnson Controls), Marshall Carter (American Family Insurance), Mingju Sun (American Family Insurance), Glenn Fung (American Family Insurance), AnHai Doan (University of Wisconsin, Madison)

PODS Invited Tutorial 1

Room: Veilingzaal **Time**: Tuesday 14:20-16:20
Chair: Pierre Bourhis

Making Consistency Protocols Serializable

Alan Fekete (University of Sydney)

Tuesday 02/07 16:20-17:50

Poster & Demo Groups A and B

Room: Grote Zaal **Time**: Tuesday 16:20-17:50

One poster for each SIGMOD and PODS paper presented on Tuesday. Plus 5 Programming Contest demos.

Representations and Optimizations for Embedded Parallel Dataflow Languages
Alexander Alexandrov (TU Berlin), Georgi Krastev (TU Berlin), Volker Markl (TU Berlin)

A Survey of Spatial Crowdsourcing
Srinivasa Raghavendra (Aalborg University), Bhuvan Gummidi (Aalborg University), Xike Xie (University of Science and Technology of China), Torben Bach Pedersen (Aalborg University)

K-Regret Queries Using Multiplicative Utility Functions
Jianzhong Qi (The University of Melbourne), Fei Zuo (The University of Melbourne), Hanan Samet (University of Maryland), Jia Cheng Yao (The University of Melbourne)

Historic Moments Discovery in Sequence Data.
Ran Bai (The Hong Kong Polytechnic University), Wing-Kai Hon (National Tsing Hua University, Taiwan), Eric Lo (Chinese University of Hong Kong), Zhian He (University of Hong Kong), Kenny Q. Zhu (Shanghai Jiao Tong University)

FindYourFavorite: An Interactive System for Finding the User's Favorite Tuple in the Database
Min Xie (Hong Kong University of Science and Technology), Tianwen Chen (Hong Kong University of Science and Technology), Raymond Chi-Wing Wong (Hong Kong University of Science and Technology)

Large Scale Graph Mining with G-Miner
Hongzhi Chen (The Chinese University of Hong Kong), Xiaoxi Wang (The Chinese University of Hong Kong), Chenghuan Huang (The Chinese University of Hong Kong), Juncheng Fang (The Chinese University of Hong Kong), Yifan Hou (The Chinese University of Hong Kong), Changji Li (The Chinese University of Hong Kong), James Cheng (The Chinese University of Hong Kong)

ANMAT: Automatic Knowledge Discovery and Error Detection through Pattern Functional Dependencies
Abdulhakim Qahtan (QCRI, HBKU), Nan Tang (QCRI, HBKU), Mourad Ouzzani (QCRI, HBKU), Yang Cao (University of Edinburgh), Michael Stonebraker (MIT)

Estimating Cardinalities with Deep Sketches
Andreas Kipf (Technische Universität München), Dimitri Vorona (Technische Universität München), Jonas Müller (Technische Universität München), Thomas Kipf (University of Amsterdam), Bernhard Radke (Technische Universität München), Viktor Leis (Technische Universität München), Peter Boncz (CWI), Thomas Neumann (Technische Universität München), Alfons Kemper (Technische Universität München)

Unit Testing Data with Deequ
Sebastian Schelter (Amazon Research), Felix Biessmann (Amazon Research), Dustin Lange (Amazon Research), Tammo Rukat (Amazon Research), Phillipp Schmidt (Amazon Research), Stephan Seufert (Amazon Research), Pierre Brunelle (Amazon Research), Andrey Taptunov (Amazon Research)

DuckDB: an Embeddable Analytical Database
Mark Raasveldt (CWI), Hannes Mühleisen (CWI)

CLASH: A High-Level Abstraction for Optimized, Multi-Way Stream Joins over Apache Storm
Manuel Dossinger (TU Kaiserslautern), Sebastian Michel (TU Kaiserslautern), Constantin Roudsarabi (TU Kaiserslautern)

PgCuckoo: Laying Plan Eggs in PostgreSQL's Nest
Denis Hirn (Universität Tübingen), Torsten Grust (Universität Tübingen)

Demonstration of ModelarDB: Model-Based Management of Dimensional Time Series
Søren Kejser Jensen (Aalborg University), Torben Bach Pedersen (Aalborg University), Christian Thomsen (Aalborg University)

NEURON: Query Execution Plan Meets Natural Language Processing For Augmenting DB Education
Siyuan Liu (Nanyang Technological University), Sourav Bhowmick (Nanyang Technological University), Wanlu Zhang (Nanyang Technological University), Shu Wang (Nanyang Technological University), Wanyi Huang (Nanyang Technological University), Shafiq Joty (Nanyang Technological University)

PIClean: A Probabilistic and Interactive Data Cleaning System
Zhuoran Yu (Georgia Institute of Technology), Xu Chu (Georgia Institute of Technology)

Apollo: A Dataset Profiling and Operator Modeling System
Tasos Bakogiannis (National Technical University of Athens), Ioannis Giannakopoulos (National Technical University of Athens), Dimitrios Tsoumakos (Ionian University), Nectarios Koziris (National Technical University of Athens)

Pivotal Greenplum© for Kubernetes: Demonstration of Managing Greenplum Database on Kubernetes
Jemish Patel (Pivotal Software Inc), Goutam Tadi (Pivotal Software Inc), Oz Basarir (Pivotal Software Inc), Lawrence Hamel (Pivotal Software Inc), David Sharp (Pivotal Software Inc), Fei Yang (Pivotal Software Inc), Xin Zhang (Pivotal Software Inc)

Demonstration of SpeakQL: Speech-driven Multimodal Querying of Structured Data
Vraj Shah (University of California, San Diego), Side Li (University of California, San Diego), Kevin Yang (University of California, San Diego), Arun Kumar (University of California, San Diego), Lawrence Saul (University of California, San Diego)

Ratel: Interactive Analytics for Large Scale Trajectories
Haoda Li (Tsinghua University), Guoliang Li (Tsinghua University), Jiayang Liu (Tsinghua University), Haitao Yuan (Tsinghua University), Haiquan Wang (Tsinghua University)

MigCast: Putting a Price Tag on Data Model Evolution in NoSQL Data Stores
Andrea Hillenbrand (Darmstadt University of Applied Sciences), Maksym Levchenko (Darmstadt University of Applied Sciences), Uta Störl (Darmstadt University of Applied Sciences), Stefanie Scherzinger (OTH Regensburg), Meike Klettke (University of Rostock)

NeMeSys - A Showcase of Data Oriented Near Memory Graph Processing
Alexander Krause (Technische Universität Dresden), Thomas Kissinger (Technische Universität Dresden), Dirk Habich (Technische Universität Dresden), Wolfgang Lehner (Technische Universität Dresden)

Low-latency Spark Queries on Updatable Data
Alexandru Uta (Vrije Universiteit Amsterdam), Bogdan Ghit (Databricks), Ankur Dave (University of California, Berkeley), Peter Boncz (CWI)

Demonstration of Nimbus: Model-based Pricing for Machine Learning in a Data Marketplace
Lingjiao Chen (University of Wisconsin, Madison), Hongyi Wang (University of Wisconsin, Madison), Leshang Chen (University of Pennsylvania), Paraschos Koutris (University of Wisconsin, Madison), Arun Kumar (University of California, San Diego)

Capturing and Querying Structural Provenance in Spark with Pebble
Ralf Diestelkämper (Universität Stuttgart), Melanie Herschel (Universität Stuttgart)

SVQ: Streaming Video Queries
Ioannis Xarchakos (University of Toronto), Nick Koudas (University of Toronto)

GraphWrangler: An Interactive Graph View on Relational Data
Nafisa Anzum (University of Waterloo), Semih Salihoglu (University of Waterloo), Daniel Vogel (University of Waterloo)

Coconut Palm: Static and Streaming Data Series Exploration Now in your Palm
Haridimos Kondylakis (FORTH-ICS), Niv Dayan (Harvard University), Kostas Zoumpatianos (Harvard University), Themis Palpanas (Paris Descartes University)

Natural Language Querying of Complex Business Intelligence Queries
Jaydeep Sen (IBM Research AI), Fatma Ozcan (IBM Research AI), Abdul Quamar (IBM Research AI), Greg Stager (IBM Canada), Ashish Mittal (IBM Research AI), Manasa Jammi (IBM Research AI), Chuan Lei (IBM Research AI), Diptikalyan Saha (IBM Research AI), Karthik Sankaranarayanan (IBM Research AI)

Tuesday 02/07 17:20-19:50

Student Research Competition

Room: Graanbeurszaal **Time**: Tuesday 17:20-19:50

SpeakQL: Towards Speech-driven Multimodal Querying
Vraj Shah (University of California, San Diego)

Fingerprints for Compressed Columnar Data Search
Carmen Kwan (University of Waterloo)

CAvSAT: A System for Query Answering over Inconsistent Databases
Akhil Dixit (University of California, Santa Cruz)

Scalable Reservoir Sampling on Many-Core CPUs
Altan Birler (Technische Universität München)

LSM-Trees and B-Trees: The Best of Both Worlds
Varun Jain (Harvard University), James Lennon (Harvard University), Harshita Gupta (Harvard University)

Generating Selective Filters for Access Method and PhysicalDesign Evaluation
Pranav Subramaniam (University of Chicago)

Interactive Visualization For Big Spatial Data
Saheli Ghosh (University of California, Riverside)

Learning to Generate Questions with Adaptive Copying Neural Networks
Xinyuan Lu (Carleton University)

Query-Driven Learning for Next Generation Predictive Modeling & Analytics
Fotis Savva (University of Glasgow)

Answering Range Queries Under Local Differential Privacy
Tejas Kulkarni (University of Warwick)

Helios: An Adaptive and Query Workload-driven Partitioning Framework for Distributed Graph Stores
Ali Davoudian (Carleton University)

Deep Query Optimization
Tin Vu (University of California, Riverside)

Bootstrapping an End-to-End Natural Language Interface for Databases
Nathaniel Weir (Brown University), Prasetya Utama (TU Darmstadt)

Recommending Deployment Strategies in Crowdsourcing Platforms
Dong Wei (New Jersey Institute of Technology)

Towards Understanding Data Analysis Workflows using a Large Notebook Corpus
Mohammed Suhail Rehman (University of Chicago)

Arachnid: Generalized Visual Data Cleaning
Conder Shou (Columbia University), Amita Shukla (Columbia University)

Tuesday 02/07 17:50-19:50

New Researcher Symposium

Room: Effectenbeurszaal **Time**: Tuesday 17:50-19:50

Publication Strategies for New Researchers: intro by the organizers
Katja Hose (Aalborg University), Spyros Blanas (Ohio State University)

Talk No.2
Aditya Parameswaran (University of California, Berkeley)

Talk No.3
Azza Abouzied (New York University, Abu Dhabi)

Talk No.4
Stratos Idreos (Harvard University)

Talk No.5
Sihem Amer-Yahia (CNRS)

Talk No.6
H.V. Jagadish (University of Michigan)

PODS 5: Semistructured Data and Knowledge Graphs, Logic, and Verification

Room: Veilingzaal **Time**: Tuesday 17:50-19:50
Chair: Reinhard Pichler

The Space-Efficient Core of Vadalog
Gerald Berger (TU Wien), Georg Gottlob (University of Oxford & TU Wien), Andreas Pieris (University of Edinburgh), Emanuel Sallinger (University of Oxford & TU Wien)

Decidable XPath Fragments in the Real World
David Baelde (ENS Paris-Saclay & CNRS, Université Paris-Saclay), Anthony Lick (ENS Paris-Saclay & CNRS, Université Paris-Saclay), Sylvain Schmitz (ENS Paris-Saclay & CNRS, Université Paris-Saclay)

Containment of Shape Expression Schemas for RDF
Slawek Staworko (CNRS & University of Lille), Piotr Wieczorek (University of Wroclaw)

Complexity Bounds for Relational Algebra over Document Spanners
Liat Peterfreund (Technion), Dominik Freydenberger (Loughborough University), Benny Kimelfeld (Technion), Markus Kröll (Vienna University of Technology)

Reachability in Database-driven Systems with Numerical Attributes under Recency Bounding
Parosh Aziz Abdulla (Uppsala University), C. Aiswarya (Chennai Mathematical Institute), Mohamed Faouzi Atig (Uppsala University), Marco Montali (KRDB Research Centre, Free University of Bozen-Bolzano)

Compiling Existential Positive Queries to Bounded-Variable Fragments
Christoph Berkholz (Humboldt-Universität zu Berlin), Hubie Chen (Birkbeck, University of London)

Tuesday 02/07 20:30-23:00

SIGMOD Reception - sponsored by MonetDB

Room: Van Gogh Museum **Time**: Tuesday 20:30-23:00

Wednesday 03/07 08:00-08:30

Coffee + Light Breakfast

Room: Grote Zaal **Time**: Wednesday 08:00-08:30

Wednesday 03/07 08:30-10:00

SIGMOD Keynote

Room: Effectenbeurszaal **Time**: Wednesday 08:30-10:00
Chair: Stefan Manegold

State of Public and Private Blockchains: Myths and Reality
C. Mohan (IBM Almaden Research Center)

Wednesday 03/07 10:00-11:00

Teaser Talks for all Wednesday SIGMOD Research and Industrial Papers

Room: Effectenbeurszaal **Time**: Wednesday 10:00-11:00
Chair: Stefan Manegold

PODS 6: Containment and Homomorphisms

Room: Veilingzaal **Time**: Wednesday 10:00-11:00
Chair: Dan Olteanu

Testability of Homomorphism Inadmissibility: Property Testing Meets Database Theory
Hubie Chen (Birkbeck, University of London), Yuichi Yoshida (National Institute of Informatics)

The Selfish Models Property: Bounding the Complexity of Query Containment and Entailment Problems
Hubie Chen (Birkbeck, University of London)

Attacking Diophantus: Solving a Special Case of Bag Containment
George Konstantinidis (University of Southampton), Fabio Mogavero (Università degli Studi di Napoli Federico II)

Wednesday 03/07 11:00-11:30

Coffee

Room: Grote Zaal **Time**: Wednesday 11:00-11:30

Wednesday 03/07 11:30-12:50

SIGMOD Research 4: Distributed Data Management

Room: Effectenbeurszaal **Time**: Wednesday 11:30-12:50
Chair: Holger Pirk

An End-to-End Automatic Cloud Database Tuning System Using Deep Reinforcement Learning
Ji Zhang (Huazhong University of Science and Technology), Yu Liu (Huazhong University of Science and Technology), Ke Zhou (Huazhong University of Science and Technology), Guoliang Li (Tsinghua University), Zhili Xiao (Tencent Inc.), Bin Cheng (Tencent Inc.), Jiashu Xing (Tencent Inc.), Yangtao Wang (Huazhong University of Science and Technology), Tianheng Cheng (Huazhong University of Science and Technology), Li Liu (Huazhong University of Science and Technology), Minwei Ran (Huazhong University of Science and Technology), Zekang Li (Huazhong University of Science and Technology)

Fast General Distributed Transactions with Opacity
Alex Shamis (Microsoft Research), Matthew Renzelmann (Microsoft), Stanko Novakovic (VMware), Georgios Chatzopoulos (EPFL), Aleksandar Dragojević (Microsoft Research), Dushyanth Narayanan (Microsoft Research), Miguel Castro (Microsoft Research)

The Log-Structured Merge-Bush & the Wacky Continuum
Niv Dayan (Harvard University), Stratos Idreos (Harvard University)

RaSQL: Greater Power and Performance for Big Data Analytics with Recursive-aggregate-SQL on Spark
Jiaqi Gu (University of California, Los Angeles), Yugo Watanabe (University of California, Los Angeles), William Mazza (University of Naples Federico II), Alexander Shkapsky (Workday, Inc.), Mohan Yang (Google), Ling Ding (University of California, Los Angeles), Carlo Zaniolo (University of California, Los Angeles)

SIGMOD Research 5: Provenance

Room: Graanbeurszaal **Time**: Wednesday 11:30-12:50
Chair: Alexandra Meliou

Going Beyond Provenance: Explaining Query Answers with Pattern-based Counterbalances
Zhengjie Miao (Duke University), Qitian Zeng (Illinois Institute of Technology), Boris Glavic (Illinois Institute of Technology), Sudeepa Roy (Duke University)

Explaining Wrong Queries Using Small Examples
Zhengjie Miao (Duke University), Sudeepa Roy (Duke University), Jun Yang (Duke University)

Ariadne: Online Provenance for Big Graph Analytics
Vicky Papavasileiou (University of California, San Diego), Ken Yocum (Intuit,Inc. & University of California, San Diego), Alin Deutsch (University of California, San Diego)

Hypothetical Reasoning via Provenance Abstraction
Daniel Deutch (Tel Aviv University), Yuval Moskovitch (Tel Aviv University), Noam Rinetzky (Tel Aviv University)

SIGMOD Research 6: Streams

Room: Administratiezaal **Time**: Wednesday 11:30-12:50
Chair: Jonathan Goldstein

Event Trend Aggregation Under Rich Event Matching Semantics
Olga Poppe (Microsoft Gray Systems Lab), Chuan Lei (IBM Almaden Research Center), Elke Rundensteiner (Worcester Polytechnic Institute), David Maier (Portland State University)

Elasticutor: Rapid Elasticity for Realtime Stateful Stream Processing
Li Wang (Yitu Technology), Tom Z. J. Fu (Advanced Digital Sciences Center), Richard T. B. Ma (National University of Singapore), Marianne Winslett (University of Illinois Urbana-Champaign), Zhenjie Zhang (Yitu Technology)

Real-Time Multi-Pattern Detection over Event Streams
Ilya Kolchinsky (Technion), Assaf Schuster (Technion)

AStream: Ad-hoc Shared Stream Processing
Jeyhun Karimov (DFKI GmbH), Tilmann Rabl (DFKI GmbH & TU Berlin), Volker Markl (DFKI GmbH & TU Berlin)

SIGMOD Industry 2: Storage and Indexing

Room: Berlage Zaal **Time**: Wednesday 11:30-12:50
Chair: Alexander Shraer

Nanosecond Indexing of Graph Data With Hash Maps and VLists
Andrew Carter (LinkedIn Corporation), Andrew Rodriguez (LinkedIn Corporation), Yiming Yang (LinkedIn Corporation), Scott Meyer (LinkedIn Corporation)

Implementation of Cluster-wide Logical Clock and Causal Consistency in MongoDB
Misha Tyulenev (MongoDB, Inc), Andy Schwerin (MongoDB, Inc), Asya Kamsky (MongoDB, Inc), Randolph Tan (MongoDB, Inc), Alyson Cabral (MongoDB, Inc), Jack Mulrow (MongoDB, Inc)

X-Engine: An Optimized Storage Engine for Large-scale E-commerce Transaction Processing
Gui Huang (Alibaba Group), Xuntao Cheng (Alibaba Group), Jianying Wang (Alibaba Group), Yujie Wang (Alibaba Group), Dengcheng He (Alibaba Group), Tieying Zhang (Alibaba Group), Feifei Li (Alibaba Group), Sheng Wang (Alibaba Group), Wei Cao (Alibaba Group), Qiang Li (Alibaba Group)

Automatically Indexing Millions of Databases in Microsoft Azure SQL Database

Sudipto Das (Microsoft), Miroslav Grbic (Microsoft), Igor Ilic (Microsoft), Isidora Jovandic (Microsoft), Andrija Jovanovic (Microsoft), Vivek Narasayya (Microsoft), Miodrag Radulovic (Microsoft), Maja Stikic (Microsoft), Gaoxiang Xu (Microsoft), Surajit Chaudhuri (Microsoft)

PODS 7: Joins, hypergraphs, and Aggregate Queries

Room: Veilingzaal **Time**: Wednesday 11:30-12:50
Chair: Hubie Chen

On Functional Aggregate Queries with Additive Inequalities

Mahmoud Abo Khamis (RelationalAI), Ryan Curtin (RelationalAI), Benjamin Moseley (Carnegie Mellon University), Hung Ngo (RelationalAI), XuanLong Nguyen (University of Michigan), Dan Olteanu (University of Oxford), Maximilian Schleich (University of Oxford)

Topology Dependent Bounds For FAQs

Michael Langberg (University at Buffalo), Shi Li (University at Buffalo), Sai Vikneshwar Mani Jayaraman (University at Buffalo), Atri Rudra (University at Buffalo)

Instance and Output Optimal Parallel Algorithms for Acyclic Joins

Xiao Hu (Hong Kong University of Science and Technology), Ke Yi (Hong Kong University of Science and Technology)

HyperBench: A Benchmark and Tool for Hypergraphs and Empirical Findings

Wolfgang Fischl (Vienna University of Technology), Georg Gottlob (University of Oxford), Davide Mario Longo (Vienna University of Technology), Reinhard Pichler (Vienna University of Technology)

Wednesday 03/07 12:50-14:20

Lunch + SIGMOD Business Meeting

Room: Grote Zaal **Time**: Wednesday 12:50-14:20

Wednesday 03/07 14:20-16:20

SIGMOD Research 7: Modern Hardware

Room: Effectenbeurszaal **Time**: Wednesday 14:20-16:20
Chair: Justin Levandoski

Concurrent Prefix Recovery: Performing CPR on a Database
Guna Prasaad (University of Washington), Badrish Chandramouli (Microsoft Research), Donald Kossmann (Microsoft Research)

BriskStream: Scaling Data Stream Processing on Shared-Memory Multicore Architectures
Shuhao Zhang (National University of Singapore), Jiong He (Advanced Digital Sciences Center), Amelie Zhou (Shenzhen University), Bingsheng He (National University of Singapore)

Border-Collie: A Wait-free, Read-optimal Algorithm for Database Logging on Multicore Hardware
Jongbin Kim (Hanyang University), Hyeongwon Jang (Hanyang University), Seohui Son (Hanyang University), Hyuck Han (Dongduk Women's University), Sooyong Kang (Hanyang University), Hyungsoo Jung (Hanyang University)

Designing Distributed Tree-based Index Structures for Fast RDMA-capable Networks
Tobias Ziegler (TU Darmstadt), Sumukha Tumkur Vani (Brown University), Carsten Binnig (TU Darmstadt), Rodrigo Fonseca (Brown University), Tim Kraska (MIT)

DistME: A Fast and Elastic Distributed Matrix Computation Engine using GPUs
Donghyoung Han (Daegu Gyeongbuk Institute of Science & Technology (DGIST)), Yoon-Min Nam (Daegu Gyeongbuk Institute of Science & Technology (DGIST)), Jihye Lee (Daegu Gyeongbuk Institute of Science & Technology (DGIST)), Kyongseok Park (Korea Institute of Science and Technology Information (KISTI)), Hyunwoo Kim (Korea Institute of Science and Technology Information (KISTI)), Min-Soo Kim (Daegu Gyeongbuk Institute of Science & Technology (DGIST))

GPU-based Graph Traversal on Compressed Graphs
Mo Sha (National University of Singapore), Yuchen Li (Singapore Management University), Kian-Lee Tan (National University of Singapore)

SIGMOD Research 8: Data Integration/Cleaning

Room: Graanbeurszaal **Time**: Wednesday 14:20-16:20
Chair: Paolo Papotti

Interventional Fairness : Causal Database Repair for Algorithmic Fairness
Babak Salimi (University of Washington), Luke Rodriguez (University of Washington), Bill Howe (University of Washington), Dan Suciu (University of Washington)

Uni-Detect: A Unified Approach to Automated Error Detection in Tables
Pei Wang (Simon Fraser University), Yeye He (Microsoft Research)

HoloDetect: Few-Shot Learning for Error Detection
Alireza Heidari (University of Waterloo), Joshua McGrath (University of Wisconsin, Madison), Ihab Ilyas (University of Waterloo), Theodoros Rekatsinas (University of Wisconsin, Madison)

JOSIE: Overlap Set Similarity Search for Finding Joinable Tables in Data Lakes
Erkang Zhu (University of Toronto), Dong Deng (Inception Institute of Artificial Intelligence), Fatemeh Nargesian (University of Toronto), Renée Miller (Northeastern University)

Raha: A Configuration-Free Error Detection System
Mohammad Mahdavi (TU Berlin), Ziawasch Abedjan (TU Berlin), Raul Castro Fernandez (MIT), Samuel Madden (MIT), Mourad Ouzzani (QCRI, HBKU), Michael Stonebraker (MIT), Nan Tang (QCRI, HBKU)

Speculative Distributed CSV Data Parsing for Big Data Analytics
Chang Ge (University of Waterloo), Yinan Li (Microsoft Research), Eric Eilebrecht (Microsoft Research), Badrish Chandramouli (Microsoft Research), Donald Kossmann (Microsoft Research)

SIGMOD Research 9: Query Processing & Optimization 2

Room: Administratiezaal **Time**: Wednesday 14:20-16:20
Chair: Jun Yang

CATAPULT: Data-driven Selection of Canned Patterns for Efficient Visual Graph Query Formulation
Kai Huang (Fudan University), Huey Chua (Nanyang Technological University), Sourav Bhowmick (Nanyang Technological University), Byron Choi (Hong Kong Baptist University), Shuigeng Zhou (Fudan University)

iQCAR: inter-Query Contention Analyzer for Data Analytics Frameworks
Prajakta Kalmegh (Duke University), Shivnath Babu (Unravel Data Systems), Sudeepa Roy (Duke University)

A Holistic Approach for Query Evaluation andResult Vocalization in Voice-Based OLAP
Immanuel Trummer (Cornell University), Yicheng Wang (Cornell University), Saketh Mahankali (Cornell University)

Top-k Queries over Digital Traces
Yifan Li (York University), Xiaohui Yu (York University), Nick Koudas (University of Toronto)

Visual Road: A Video Data Management Benchmark
Brandon Haynes (University of Washington), Amrita Mazumdar (University of Washington), Magdalena Balazinska (University of Washington), Luis Ceze (University of Washington), Alvin Cheung (University of Washington)

Mining Precision Interfaces From Query Logs
Qianrui Zhang (Tsinghua University), Haoci Zhang (Columbia University), Thibault Sellam (Columbia University), Eugene Wu (Columbia University)

SIGMOD Research 10: Graphs 1

Room: Berlage Zaal **Time**: Wednesday 14:20-16:20
Chair: Angela Bonifati

Distance-generalized Core Decomposition
Francesco Bonchi (ISI Foundation & Eurecat), Arijit Khan (Nanyang Technological University), Lorenzo Severini (ISI Foundation)

Unboundedness and Efficiency of Truss Maintenance in Evolving Graphs
Yikai Zhang (Chinese University of Hong Kong), Jeffrey Yu (Chinese University of Hong Kong)

PRSim: Sublinear Time SimRank Computation on Large Power-Law Graphs
Zhewei Wei (Renmin University of China), Xiaodong He (4Paradigm Inc.), Xiaokui Xiao (National University of Singapore), Sibo Wang (The Chinese University of Hong Kong), Yu Liu (Peking University), Xiaoyong Du (Renmin University of China), Ji-Rong Wen (Renmin University of China)

Scaling Distance Labeling on Small-World Networks
Wentao Li (University of Technology Sydney), Miao Qiao (University of Auckland), Lu Qin (University of Technology Sydney), Ying Zhang (University of Technology Sydney), Lijun Chang (University of Sydney), Xuemin Lin (University of New South Wales)

Maximizing Welfare in Social Networks under A Utility Driven Influence Diffusion model
Prithu Banerjee (University of British Columbia), Wei Chen (Microsoft Research), Laks Lakshmanan (University of British Columbia)

Efficient Approximation Algorithms for Adaptive Seed Minimization
Jing Tang (National University of Singapore), Keke Huang (Nanyang Technological University), Xiaokui Xiao (National University of Singapore), Laks Lakshmanan (University of British Columbia), Xueyan Tang (Nanyang Technological University), Aixin Sun (Nanyang Technological University), Andrew Lim (National University of Singapore)

PODS Invited Tutorial 2

Room: Veilingzaal **Time**: Wednesday 14:20-16:20
Chair: Christoph Koch

Algorithmic Fairness: Measures, Methods and Representations
Suresh Venkatasubramanian (University of Utah)

Wednesday 03/07 16:20-17:50

Poster & Demo Groups B and C

Room: Grote Zaal **Time**: Wednesday 16:20-17:50

One poster for each SIGMOD and PODS paper presented on Wednesday.

Pivotal Greenplum© for Kubernetes: Demonstration of Managing Greenplum Database on Kubernetes
Jemish Patel (Pivotal Software Inc), Goutam Tadi (Pivotal Software Inc), Oz Basarir (Pivotal Software Inc), Lawrence Hamel (Pivotal Software Inc), David Sharp (Pivotal Software Inc), Fei Yang (Pivotal Software Inc), Xin Zhang (Pivotal Software Inc)

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Jaydeep Sen (IBM Research AI), Fatma Ozcan (IBM Research AI), Abdul Quamar (IBM Research AI), Greg Stager (IBM Canada), Ashish Mittal (IBM Research AI), Manasa Jammi (IBM Research AI), Chuan Lei (IBM Research AI), Diptikalyan Saha (IBM Research AI), Karthik Sankaranarayanan (IBM Research AI)

Peering through the Dark: An Owl's View of Inter-job Dependencies and Jobs' Impact in Shared Clusters
Andrew Chung (Carnegie Mellon University), Carlo Curino (Microsoft), Subru Krishnan (Microsoft), Konstantinos Karanasos (Microsoft), Panagiotis Garefalakis (Imperial College London), Gregory Ganger (Carnegie Mellon University)

Visual Exploration of Time Series Anomalies with Metro-Viz
Philipp Eichmann (Brown University), Franco Solleza (Brown University), Nesime Tatbul (Intel Labs and MIT), Stan Zdonik (Brown University)

Data Debugging and Exploration with Vizier
Mike Brachmann (University at Buffalo), Carlos Bautista (New York University), Sonia Castelo (New York University), Su Feng (Illinois Institute of Technology), Juliana Freire (New York University), Boris Glavic (Illinois Institute of Technology), Oliver Kennedy (University of Buffalo), Heiko Müeller (New York University), Rémi Rampin (New York University), William Spoth (University at Buffalo), Ying Yang (Oracle)

CrowdGame: A Game-Based Crowdsourcing System for Cost-Effective Data Labeling
Tongyu Liu (Renmin University of China), Jingru Yang (Renmin University of China), Ju Fan (Renmin University of China), Zhewei Wei (Renmin University of China), Guoliang Li (Tsinghua University), Xiaoyong Du (Renmin University of China)

Ursprung: Provenance for Large-Scale Analytics Environments
Lukas Rupprecht (IBM Almaden Research Center), James Davis (Virginia Tech & IBM Systems), Constantine Arnold (IBM Almaden Research Center), Alexander Lubbock (Vanderbilt University), Darren Tyson (Vanderbilt University), Deepavali Bhagwat (IBM Almaden Research Center)

BlockchainDB - Towards a Shared Database on Blockchains
Muhammad El-Hindi (TU Darmstadt), Martin Heyden (TU Darmstadt), Carsten Binnig (TU Darmstadt), Ravi Ramamurthy (Microsoft Research), Arvind Arasu (Microsoft Research), Donald Kossmann (Microsoft Research)

Fluid: A Blockchain based Framework for Crowdsourcing
Siyuan Han (Hong Kong University of Science and Technology), Zihuan Xu (Hong Kong University of Science and Technology), Yuxiang Zeng (Hong Kong University of Science and Technology), Lei Chen (Hong Kong University of Science and Technology)

MorphStore - In-Memory Query Processing based on Morphing Compressed Intermediates LIVE
Dirk Habich (Technische Universität Dresden), Patrick Damme (Technische Universität Dresden), Annett Ungethüm (Technische Universität Dresden), Johannes Pietrzyk (Technische Universität Dresden), Alexander Krause (Technische Universität Dresden), Juliana Hildebrandt (Technische Universität Dresden), Wolfgang Lehner (Technische Universität Dresden)

MapRepair: Mapping and Repairing under Policy Views
Angela Bonifati (Lyon 1 University & Liris CNRS), Ugo Comignani (Lyon 1 University & Liris CNRS), Efthymia Tsamoura (University of Oxford)

RATest: Explaining Wrong Relational Queries Using Small Examples
Zhengjie Miao (Duke University), Sudeepa Roy (Duke University), Jun Yang (Duke University)

NAVIGATE: Explainable Visual Graph Exploration by Examples
Mohammad Hossein Namaki (Washington State University), Qi Song (Washington State University), Yinghui Wu (Washington State University)

C2Metadata: Automating the Capture of Data Transformations from Statistical Scripts in Data Documentation
Jie Song (University of Michigan), George Alter (University of Michigan), H. V. Jagadish (University of Michigan)

MithraRanking: A System for Responsible Ranking Design
Yifan Guan (University of Michigan), Abolfazl Asudeh (University of Michigan), Pranav Mayuram (University of Michigan), H. V. Jagadish (University of Michigan), Julia Stoyanovich (New York University), Gerome Miklau (University of Massachusetts Amherst), Gautam Das (University of Texas at Arlington)

NEWS: News Event Walker and Summarizer
Radityo Eko Prasojo (Free University of Bozen-Bolzano), Mouna Kacimi (Free University of Bozen-Bolzano), Werner Nutt (Free University of Bozen-Bolzano)

Cost-Effective, Workload-Adaptive Migration of Big Data Applications to the Cloud
Victor Giannakouris (Unravel Data Systems), Alejandro Fernandez (Unravel Data Systems), Alkis Simitsis (Unravel Data Systems), Shivnath Babu (Unravel Data Systems)

ChronosDB in Action: Manage, Process, and Visualize Big Geospatial Arrays in the Cloud
Ramon Antonio Rodriges Zalipynis (National Research University Higher School of Economics)

Wednesday 03/07 17:50-20:30

Dinner Transfer incl. Canal Cruise

Room: 20 boats (Rederij Stromma) **Time**: Wednesday 17:50-20:30

Wednesday 03/07 20:30-23:00

SIGMOD Dinner - sponsored by Facebook

Room: Noorderlicht Cafe **Time**: Wednesday 20:30-23:00

Thursday 04/07 08:00-08:30

Coffee + Light Breakfast

Room: Grote Zaal **Time**: Thursday 08:00-08:30

Thursday 04/07 08:30-10:00

SIGMOD Award Talks

Room: Effectenbeurszaal **Time**: Thursday 08:30-10:00
Chair: Anastasia Ailamaki

Data Management on Non-Volatile Memory
Joy Arulraj (Georgia Institute of Technology)

Formal Approaches to Querying Big Data in Shared-Nothing Systems
Bas Ketsman (EPFL)

Thursday 04/07 10:00-11:00

Teaser Talks for all Thursday SIGMOD Research and Industrial Papers

Room: Effectenbeurszaal **Time**: Thursday 10:00-11:00
Chair: Anastasia Ailamaki

Thursday 04/07 11:00-11:30

Coffee

Room: Grote Zaal **Time**: Thursday 11:00-11:30

Thursday 04/07 11:30-12:50

SIGMOD Research 11: Systems & Machine Learning

Room: Effectenbeurszaal **Time**: Thursday 11:30-12:50
Chair: Matthias Boehm

DeepBase: Deep Inspection of Neural Networks
Thibault Sellam (Columbia University), Kevin Lin (Columbia University), Ian Huang (Columbia University), Michelle Yang (University of California, Berkeley), Carl Vondrick (Columbia University), Eugene Wu (Columbia University)

BlinkML: Efficient Maximum Likelihood Estimation with Probabilistic Guarantees
Yongjoo Park (University of Michigan), Jingyi Qing (University of Michigan), Xiaoyang Shen (University of Michigan), Barzan Mozafari (University of Michigan)

SkinnerDB: Regret-Bounded Query Evaluation via Reinforcement Learning
Immanuel Trummer (Cornell University), Junxiong Wang (Cornell University), Deepak Maram (Cornell University), Samuel Moseley (Cornell University), Saehan Jo (Cornell University), Joseph Antonakakis (Cornell University)

Democratizing Data Science through Interactive Curation of ML Pipelines
Zeyuan Shang (MIT), Emanuel Zgraggen (MIT), Benedetto Buratti (Brown University), Ferdinand Kossmann (MIT), Philipp Eichmann (Brown University), Yeounoh Chung (Brown University), Carsten Binnig (Brown University & TU Darmstadt), Eli Upfal (Brown University), Tim Kraska (MIT)

SIGMOD Research 12: Indexing

Room: Graanbeurszaal **Time**: Thursday 11:30-12:50
Chair: Stratos Idreos

FITing-Tree: A Data-aware Index Structure
Alex Galakatos (Brown University), Michael Markovitch (Brown University), Carsten Binnig (TU Darmstadt), Rodrigo Fonseca (Brown University), Tim Kraska (MIT)

Hyperion: Building the Largest In-memory Search Tree
Markus Mäsker (Johannes Gutenberg University Mainz), Tim Süß (University of Applied Science Fulda), Lars Nagel (Loughborough University), Lingfang Zeng (Huazhong University of Science and Technology), André Brinkmann (Johannes Gutenberg University Mainz)

Designing Succinct Secondary Indexing Mechanism by Exploiting Column Correlations
Yingjun Wu (IBM Almaden Research Center), Jia Yu (Arizona State University), Yuanyuan Tian (IBM Almaden Research Center), Richard Sidle (IBM), Ronald Barber (IBM Almaden Research Center)

AI Meets AI: Leveraging Query Executions to Improve Index Recommendations
Bailu Ding (Microsoft Research), Sudipto Das (Microsoft Research), Ryan Marcus (Brandeis University), Wentao Wu (Microsoft Research), Surajit Chaudhuri (Microsoft Research), Vivek Narasayya (Microsoft Research)

SIGMOD Research 13: Fairness, Uncertainty

Room: Administratiezaal **Time**: Thursday 11:30-12:50
Chair: Ke Yi

Designing Fair Ranking Schemes
Abolfazl Asudeh (University of Michigan), H. V. Jagadish (University of Michigan), Julia Stoyanovich (New York University), Gautam Das (University of Texas at Arlington)

Anti-Freeze for Large and Complex Spreadsheets: Asynchronous Formula Computation
Mangesh Bendre (University of Illinois Urbana-Champaign), Tana Wattanawaroon (University of Illinois Urbana-Champaign), Kelly Mack (University of Illinois Urbana-Champaign), Kevin Chang (University of Illinois Urbana-Champaign), Aditya Parameswaran (University of Illinois Urbana-Champaign)

Anytime Approximation in Probabilistic Databases via Scaled Dissociations
Maarten Van den Heuvel (University of Antwerp), Peter Ivanov (Northeastern University), Wolfgang Gatterbauer (Northeastern University), Floris Geerts (University of Antwerp), Martin Theobald (University of Luxembourg)

Uncertainty Annotated Databases - A Lightweight Approach for Approximating Certain Answers
Su Feng (Illinois Institute of Technology), Aaron Huber (University at Buffalo), Boris Glavic (Illinois Institute of Technology), Oliver Kennedy (University at Buffalo)

SIGMOD Research 14: Graphs 2

Room: Berlage Zaal **Time**: Thursday 11:30-12:50
Chair: Sourav S Bhowmick

Efficient Estimation of Heat Kernel PageRank for Local Clustering
Renchi Yang (Nanyang Technological University), Xiaokui Xiao (National University of Singapore), Zhewei Wei (Renmin University of China), Sourav Bhowmick (Nanyang Technological University), Jun Zhao (Nanyang Technological University), Rong-Hua Li (Beijing Institute of Technology)

Fractal: A General-Purpose Graph Pattern Mining System
Vinicius Dias (Universidade Federal de Minas Gerais), Carlos Teixeira (Universidade Federal de Minas Gerais), Dorgival Guedes (Universidade Federal de Minas Gerais), Wagner Meira (Universidade Federal de Minas Gerais), Srinivasan Parthasarathy (Ohio State University)

Experimental Analysis of Streaming Algorithms for Graph Partitioning
Anil Pacaci (University of Waterloo), Tamer Özsu (University of Waterloo)

Interactive Graph Search
Yufei Tao (Chinese University of Hong Kong), Yuanbing Li (Tsinghua University), Guoliang Li (Tsinghua University)

Thursday 04/07 12:50-14:20

Lunch

Room: Grote Zaal **Time**: Thursday 12:50-14:20

Thursday 04/07 14:20-16:20

SIGMOD Research 15: Graphs 3

Room: Effectenbeurszaal **Time**: Thursday 14:20-16:20
Chair: Xuemin Lin

Optimizing Declarative Graph Queries at Large Scale
Qizhen Zhang (University of Pennsylvania), Akash Acharya (University of Pennsylvania), Hongzhi Chen (The Chinese University of Hong Kong), Simran Arora (University of Pennsylvania), Ang Chen (Rice University), Vincent Liu (University of Pennsylvania), Boon Loo (University of Pennsylvania)

Efficient Subgraph Matching: Harmonizing Dynamic Programming, Adaptive Matching Order, and Failing Set Together
Myoungji Han (Seoul National University), Hyunjoon Kim (Seoul National University), Geonmo Gu (Seoul National University), Kunsoo Park (Seoul National University), Wook-Shin Han (Pohang University of Science and Technology (POSTECH))

CECI: Compact Embedding Cluster Index for Scalable Subgraph Matching
Bibek Bhattarai (George Washington University), Hang Liu (University of Massachusetts Lowell), H. Howie Huang (George Washington University)

Efficiently Answering Regular Simple Path Queries on Large Labeled Networks
Sarisht Wadhwa (IIT Delhi), Anagh Prasad (IIT Delhi), Sayan Ranu (IIT Delhi), Amitabha Bagchi (IIT Delhi), Srikanta Bedathur (IIT Delhi)

Answering Why-questions by Exemplars in Attributed Graphs
Mohammad Hossein Namaki (Washington State University), Qi Song (Washington State University), Yinghui Wu (Washington State University), Shengqi Yang (WeWork Technology)

An Efficient Index for RDF Query Containment
Theofilos Mailis (Athena Research Centre & University of Athens), Yannis Kotidis (Athens University of Economics and Business), Vaggelis Nikolopoulos (University of Athens), Evgeny Kharlamov (University of Oslo & Bosch Center for AI), Ian Horrocks (University of Oxford), Yannis Ioannidis (Athena Research Centre & University of Athens)

SIGMOD Research 16: Machine Learning

Room: Graanbeurszaal **Time**: Thursday 14:20-16:20
Chair: Theodoros Rekatsinas

Tuple-oriented Compression for Large-scale Mini-batch Stochastic Gradient Descent

Fengan Li (University of Wisconsin, Madison), Lingjiao Chen (University of Wisconsin, Madison), Yijing Zeng (University of Wisconsin, Madison), Arun Kumar (University of California, San Diego), Xi Wu (University of Wisconsin, Madison), Jeffrey Naughton (University of Wisconsin, Madison), Jignesh Patel (University of Wisconsin, Madison)

Towards Model-based Pricing for Machine Learning in a Data Marketplace

Lingjiao Chen (University of Wisconsin, Madison), Paraschos Koutris (University of Wisconsin, Madison), Arun Kumar (University of California, San Diego)

DBEst: Revisiting Approximate Query Processing Engines with Machine Learning Models

Qingzhi Ma (University of Warwick), Peter Triantafillou (University of Warwick)

Enabling and Optimizing Non-linear Feature Interactions in Factorized Linear Algebra

Side Li (University of California, San Diego), Lingjiao Chen (University of Wisconsin, Madison), Arun Kumar (University of California, San Diego)

Incremental and Approximate Inference for Faster Occlusion-based Deep CNN Explanations

Supun Nakandala (University of California, San Diego), Arun Kumar (University of California, San Diego), Yannis Papakonstantinou (University of California, San Diego)

MNC: Structure-Exploiting Sparsity Estimation for Matrix Expressions

Johanna Sommer (IBM Germany), Matthias Boehm (Graz University of Technology), Alexandre Evfimievski (IBM Almaden Research Center), Berthold Reinwald (IBM Almaden Research Center), Peter Haas (University of Massachusetts Amherst)

SIGMOD Research 17: Scalability

Room: Administratiezaal **Time**: Thursday 14:20-16:20
Chair: Norman May

A Scalable Index for Top-k Subtree Similarity Queries
Daniel Kocher (University of Salzburg), Nikolaus Augsten (University of Salzburg)

A Layered Aggregate Engine for Analytics Workloads
Maximilian Schleich (University of Oxford), Dan Olteanu (University of Oxford), Mahmoud Abo Khamis (RelationalAI), Hung Ngo (RelationalAI), XuanLong Nguyen (University of Michigan)

Towards Scalable Hybrid Stores: Constraint-Based Rewriting to the Rescue
Rana Alotaibi (University of California, San Diego), Damian Bursztyn (Thales), Alin Deutsch (University of California, San Diego), Ioana Manolescu (Inria & Ecole polytechnique), Stamatis Zampetakis (Orchestra Networks)

MIFO: A Query-Semantic Aware Resource Allocation Policy
Prajakta Kalmegh (Duke University), Shivnath Babu (Unravel Data Systems)

Dissecting the Performance of Strongly-Consistent Replication Protocols
Ailidani Ailijiang (Microsoft), Aleksey Charapko (University at Buffalo, SUNY), Murat Demirbas (University at Buffalo, SUNY)

FishStore: Faster Ingestion with Subset Hashing
Dong Xie (University of Utah), Badrish Chandramouli (Microsoft Research), Yinan Li (Microsoft Research), Donald Kossmann (Microsoft Research)

SIGMOD Industry 3: Data Platforms

Room: Berlage Zaal **Time**: Thursday 14:20-16:20
Chair: Ying Zhang

CFS: A Distributed File System for Large Scale Container Platforms
Haifeng Liu (University of Science and Technology of China), Wei Ding (JD.com), Yuan Chen (JD.com), Weilong Guo (JD.com), Shuoran Liu (JD.com), Tianpeng Li (JD.com), Mofei Zhang (JD.com), Jianxing Zhao (JD.com), Hongyin Zhu (JD.com), Zhengyi Zhu (JD.com)

Socrates: The New SQL Server in the Cloud
Panagiotis Antonopoulos (Microsoft), Alex Budovski (Microsoft), Cristian Diaconu (Microsoft), Alejandro Hernandez (Microsoft), Jack Hu (Microsoft), Hanuma Kodavalla (Microsoft), Donald Kossmann (Microsoft Research), Umar Farooq Minhas (Microsoft Research), Naveen Prakash (Microsoft), Vijendra Purohit (Microsoft), Hugh Qu (Microsoft), Chaitanya Sreenivas Ravella (Microsoft), Krystyna Reisteter (Microsoft), Sheetal Shrotri (Microsoft), Dixin Tang (University of Chicago), Vikram Wakade (Microsoft)

One SQL to Rule Them All - an Efficient and Syntactically Idiomatic Approach to Management of Streams and Tables
Edmon Begoli (Oak Ridge National Laboratory), Tyler Akidau (Google), Fabian Hueske (Ververica), Julian Hyde (Looker Inc.), Kathryn Knight (Oak Ridge National Laboratory), Kenneth Knowles (Google)

Apache Hive: From MapReduce to Enterprise-grade Big Data Warehousing
Jesús Camacho-Rodríguez (Hortonworks), Ashutosh Chauhan (Hortonworks), Alan Gates (Hortonworks), Eugene Koifman (Hortonworks), Owen O'Malley (Hortonworks), Vineet Garg (Hortonworks), Zoltan Haindrich (Hortonworks), Sergey Shelukhin (Hortonworks), Prasanth Jayachandran (Hortonworks), Siddharth Seth (Hortonworks), Deepak Jaiswal (Hortonworks), Slim Bouguerra (Hortonworks), Nishant Bangarwa (Hortonworks), Sankar Hariappan (Hortonworks), Anishek Agarwal (Hortonworks), Jason Dere (Hortonworks), Daniel Dai (Hortonworks), Thejas Nair (Hortonworks), Nita Dembla (Hortonworks), Gopal Vijayaraghavan (Hortonworks), Günther Hagleitner (Hortonworks)

FoundationDB Record Layer: A Multi-Tenant Structured Datastore
Christos Chrysafis (Apple), Ben Collins (Apple), Scott Dugas (Apple), Jay Dunkelberger (Apple), Moussa Ehsan (Apple), Scott Gray (Apple), Alec Grieser (Apple), Ori Herrnstadt (Apple), Kfir Lev-Ari (Apple), Tao Lin (Apple), Mike McMahon (Apple), Nicholas Schiefer (Apple), Alexander Shraer (Apple)

Data Platform for Machine Learning
Pulkit Agrawal (Apple), Rajat Arya (Apple), Aanchal Bindal (Apple), Sandeep Bhatia (Apple), Anupriya Gagneja (Apple), Joseph Godlewski (Apple), Yucheng Low (Apple), Timothy Muss (Apple), Mudit Manu Paliwal (Apple), Sethu Raman (Apple), Vishrut Shah (Apple), Bochao Shen (Apple), Laura Sugden (Apple), Kaiyu Zhao (Apple), Ming-Chuan Wu (Apple)

Thursday 04/07 16:20-17:50

Poster & Demo Groups A and C

Room: Grote Zaal **Time**: Thursday 16:20-17:50

One poster for each SIGMOD paper presented on Thursday.

FindYourFavorite: An Interactive System for Finding the User's Favorite Tuple in the Database
Min Xie (Hong Kong University of Science and Technology), Tianwen Chen (Hong Kong University of Science and Technology), Raymond Chi-Wing Wong (Hong Kong University of Science and Technology)

Large Scale Graph Mining with G-Miner
Hongzhi Chen (The Chinese University of Hong Kong), Xiaoxi Wang (The Chinese University of Hong Kong), Chenghuan Huang (The Chinese University of Hong Kong), Juncheng Fang (The Chinese University of Hong Kong), Yifan Hou (The Chinese University of Hong Kong), Changji Li (The Chinese University of Hong Kong), James Cheng (The Chinese University of Hong Kong)

ANMAT: Automatic Knowledge Discovery and Error Detection through Pattern Functional Dependencies
Abdulhakim Qahtan (QCRI, HBKU), Nan Tang (QCRI, HBKU), Mourad Ouzzani (QCRI, HBKU), Yang Cao (University of Edinburgh), Michael Stonebraker (MIT)

Estimating Cardinalities with Deep Sketches
Andreas Kipf (Technische Universität München), Dimitri Vorona (Technische Universität München), Jonas Müller (Technische Universität München), Thomas Kipf (University of Amsterdam), Bernhard Radke (Technische Universität München), Viktor Leis (Technische Universität München), Peter Boncz (CWI), Thomas Neumann (Technische Universität München), Alfons Kemper (Technische Universität München)

Unit Testing Data with Deequ
Sebastian Schelter (Amazon Research), Felix Biessmann (Amazon Research), Dustin Lange (Amazon Research), Tammo Rukat (Amazon Research), Phillipp Schmidt (Amazon Research), Stephan Seufert (Amazon Research), Pierre Brunelle (Amazon Research), Andrey Taptunov (Amazon Research)

DuckDB: an Embeddable Analytical Database
Mark Raasveldt (CWI), Hannes Mühleisen (CWI)

CLASH: A High-Level Abstraction for Optimized, Multi-Way Stream Joins over Apache Storm
Manuel Dossinger (TU Kaiserslautern), Sebastian Michel (TU Kaiserslautern), Constantin Roudsarabi (TU Kaiserslautern)

PgCuckoo: Laying Plan Eggs in PostgreSQL's Nest
Denis Hirn (Universität Tübingen), Torsten Grust (Universität Tübingen)

Demonstration of ModelarDB: Model-Based Management of Dimensional Time Series
Søren Kejser Jensen (Aalborg University), Torben Bach Pedersen (Aalborg University), Christian Thomsen (Aalborg University)

NEURON: Query Execution Plan Meets Natural Language Processing For Augmenting DB Education
Siyuan Liu (Nanyang Technological University), Sourav Bhowmick (Nanyang Technological University), Wanlu Zhang (Nanyang Technological University), Shu Wang (Nanyang Technological University), Wanyi Huang (Nanyang Technological University), Shafiq Joty (Nanyang Technological University)

PIClean: A Probabilistic and Interactive Data Cleaning System
Zhuoran Yu (Georgia Institute of Technology), Xu Chu (Georgia Institute of Technology)

Apollo: A Dataset Profiling and Operator Modeling System
Tasos Bakogiannis (National Technical University of Athens), Ioannis Giannakopoulos (National Technical University of Athens), Dimitrios Tsoumakos (Ionian University), Nectarios Koziris (National Technical University of Athens)

Peering through the Dark: An Owl's View of Inter-job Dependencies and Jobs' Impact in Shared Clusters
Andrew Chung (Carnegie Mellon University), Carlo Curino (Microsoft), Subru Krishnan (Microsoft), Konstantinos Karanasos (Microsoft), Panagiotis Garefalakis (Imperial College London), Gregory Ganger (Carnegie Mellon University)

Visual Exploration of Time Series Anomalies with Metro-Viz
Philipp Eichmann (Brown University), Franco Solleza (Brown University), Nesime Tatbul (Intel Labs and MIT), Stan Zdonik (Brown University)

Data Debugging and Exploration with Vizier
Mike Brachmann (University at Buffalo), Carlos Bautista (New York University), Sonia Castelo (New York University), Su Feng (Illinois Institute of Technology), Juliana Freire (New York University), Boris Glavic (Illinois Institute of Technology), Oliver Kennedy (University of Buffalo), Heiko Müeller (New York University), Rémi Rampin (New York University), William Spoth (University at Buffalo), Ying Yang (Oracle)

CrowdGame: A Game-Based Crowdsourcing System for Cost-Effective Data Labeling
Tongyu Liu (Renmin University of China), Jingru Yang (Renmin University of China), Ju Fan (Renmin University of China), Zhewei Wei (Renmin University of China), Guoliang Li (Tsinghua University), Xiaoyong Du (Renmin University of China)

Ursprung: Provenance for Large-Scale Analytics Environments
Lukas Rupprecht (IBM Almaden Research Center), James Davis (Virginia Tech & IBM Systems), Constantine Arnold (IBM Almaden Research Center), Alexander Lubbock (Vanderbilt University), Darren Tyson (Vanderbilt University), Deepavali Bhagwat (IBM Almaden Research Center)

BlockchainDB - Towards a Shared Database on Blockchains
Muhammad El-Hindi (TU Darmstadt), Martin Heyden (TU Darmstadt), Carsten Binnig (TU Darmstadt), Ravi Ramamurthy (Microsoft Research), Arvind Arasu (Microsoft Research), Donald Kossmann (Microsoft Research)

Fluid: A Blockchain based Framework for Crowdsourcing
Siyuan Han (Hong Kong University of Science and Technology), Zihuan Xu (Hong Kong University of Science and Technology), Yuxiang Zeng (Hong Kong University of Science and Technology), Lei Chen (Hong Kong University of Science and Technology)

MorphStore - In-Memory Query Processing based on Morphing Compressed Intermediates LIVE
Dirk Habich (Technische Universität Dresden), Patrick Damme (Technische Universität Dresden), Annett Ungethüm (Technische Universität Dresden), Johannes Pietrzyk (Technische Universität Dresden), Alexander Krause (Technische Universität Dresden), Juliana Hildebrandt (Technische Universität Dresden), Wolfgang Lehner (Technische Universität Dresden)

MapRepair: Mapping and Repairing under Policy Views
Angela Bonifati (Lyon 1 University & Liris CNRS), Ugo Comignani (Lyon 1 University & Liris CNRS), Efthymia Tsamoura (University of Oxford)

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Ramon Antonio Rodriges Zalipynis (National Research University Higher School of Economics)

Thursday 04/07 17:30-18:00

ADS Reception 1 - sponsored by Elsevier

Room: Graanbeurszaal **Time**: Thursday 17:30-18:00

Thursday 04/07 18:00-19:30

ADS Event

Room: Effectenbeurszaal **Time**: Thursday 18:00-19:30

ADS Event
Jeanne Kroeger (ADS)

Thursday 04/07 19:30-20:00

ADS Reception 2 - sponsored by Elsevier

Room: Graanbeurszaal **Time**: Thursday 19:30-20:00

Friday 07/07 08:30-09:00

Coffee + Light Breakfast

Room: Grote Zaal **Time**: Friday 08:30-09:00

Friday 07/07 09:00-10:30

Tutorial 4: part 1

Room: Verwey Kamer **Time**: Friday 09:00-10:30

Classical and Contemporary Approaches to Big Time Series Forecasting
Christos Faloutsos (Carnegie Mellon University & Amazon), Jan Gasthaus (AWS AI Labs), Tim Januschowski (AWS AI Labs), Yuyang Wang (AWS AI Labs)

Tutorial 6: part 1

Room: Effectenbeurszaal **Time**: Friday 09:00-10:30

From Auto-tuning One Size Fits All to Self-designed and Learned Data-intensive Systems
Stratos Idreos (Harvard University), Tim Kraska (MIT)

HILDA 2019: Session 1

Room: Berlage Zaal **Time**: Friday 09:00-10:30

HILDA 2019: the International Workshop on Human-In-the-Loop Data Analytics
Leilani Battle (University of Maryland), Surajit Chaudhuri (Microsoft), Arnab Nandi (The Ohio State University)

aiDM 2019: Session 1

Room: Administratiezaal **Time**: Friday 09:00-10:30

aiDM 2019: the 2nd International Workshop on Exploiting Artificial Intelligence Techniques for Data Management
Rajesh Bordawekar (IBM T. J. Watson Research Center), Oded Shmueli (Computer Science Department, Technion)

SBD 2019: Session 1

Room: Veilingzaal **Time**: Friday 09:00-10:30

SBD 2019: the Fourth International Workshop on Semantic Big Data
Sven Groppe (University of Lübeck), Le Gruenwald (University of Oklahoma)

Friday 07/07 10:30-11:00

Coffee

Room: Grote Zaal **Time**: Friday 10:30-11:00

Friday 07/07 11:00-12:30

Tutorial 4: part 2

Room: Verwey Kamer **Time**: Friday 11:00-12:30

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Christos Faloutsos (Carnegie Mellon University & Amazon), Jan Gasthaus (AWS AI Labs), Tim Januschowski (AWS AI Labs), Yuyang Wang (AWS AI Labs)

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HILDA 2019: Session 2

Room: Berlage Zaal **Time**: Friday 11:00-12:30

HILDA 2019: the International Workshop on Human-In-the-Loop Data Analytics
Leilani Battle (University of Maryland), Surajit Chaudhuri (Microsoft), Arnab Nandi (The Ohio State University)

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Rajesh Bordawekar (IBM T. J. Watson Research Center), Oded Shmueli (Computer Science Department, Technion)

SBD 2019: Session 2

Room: Veilingzaal **Time**: Friday 11:00-12:30

SBD 2019: the Fourth International Workshop on Semantic Big Data
Sven Groppe (University of Lübeck), Le Gruenwald (University of Oklahoma)

LDBC Technical User Community Meeting: session 1

Room: Ontvangkamer **Time**: Friday 11:00-12:30

LDBC Technical User Community Meeting
Peter Boncz (LDBC (CWI)), Alastair Green (LDBC (Neo4j))

Friday 07/07 12:30-14:00

Lunch

Room: Grote Zaal **Time**: Friday 12:30-14:00

Friday 07/07 14:00-15:30

Tutorial 5: part 1

Room: Verwey Kamer **Time**: Friday 14:00-15:30

Data Pipelines for User Group Analytics
Behrooz Omidvar-Tehrani (University of Grenoble Alpes), Sihem Amer-Yahia (University of Grenoble Alpes and CNRS)

Tutorial 7

Room: Effectenbeurszaal **Time**: Friday 14:00-15:30

Schemas and Types for JSON Data: From Theory to Practice
Mohamed-Amine Baazizi (Sorbonne Université, LIP6 UMR 7606), Dario Colazzo (Université Paris-Dauphine, PSL Research University), Giorgio Ghelli (Università di Pisa), Carlo Sartiani (Università della Basilicata)

HILDA 2019: Session 3

Room: Berlage Zaal **Time**: Friday 14:00-15:30

HILDA 2019: the International Workshop on Human-In-the-Loop Data Analytics
Leilani Battle (University of Maryland), Surajit Chaudhuri (Microsoft), Arnab Nandi (The Ohio State University)

aiDM 2019: Session 3

Room: Administratiezaal **Time**: Friday 14:00-15:30

aiDM 2019: the 2nd International Workshop on Exploiting Artificial Intelligence Techniques for Data Management
Rajesh Bordawekar (IBM T. J. Watson Research Center), Oded Shmueli (Computer Science Department, Technion)

SBD 2019: Session 3

Room: Veilingzaal **Time**: Friday 14:00-15:30

SBD 2019: the Fourth International Workshop on Semantic Big Data
Sven Groppe (University of Lübeck), Le Gruenwald (University of Oklahoma)

LDBC Technical User Community Meeting: session 2

Room: Ontvangkamer **Time**: Friday 14:00-15:30

LDBC Technical User Community Meeting
Peter Boncz (LDBC (CWI)), Alastair Green (LDBC (Neo4j))

Friday 07/07 15:30-16:30

Coffee + Workshop Posters

Room: Grote Zaal **Time**: Friday 15:30-16:30

Friday 07/07 16:30-18:00

Tutorial 5: part 2

Room: Verwey Kamer **Time**: Friday 16:30-18:00

Data Pipelines for User Group Analytics
Behrooz Omidvar-Tehrani (University of Grenoble Alpes), Sihem Amer-Yahia (University of Grenoble Alpes and CNRS)

HILDA 2019: Session 4

Room: Berlage Zaal **Time**: Friday 16:30-18:00

HILDA 2019: the International Workshop on Human-In-the-Loop Data Analytics
Leilani Battle (University of Maryland), Surajit Chaudhuri (Microsoft), Arnab Nandi (The Ohio State University)

aiDM 2019: Session 4

Room: Administratiezaal **Time**: Friday 16:30-18:00

aiDM 2019: the 2nd International Workshop on Exploiting Artificial Intelligence Techniques for Data Management
Rajesh Bordawekar (IBM T. J. Watson Research Center), Oded Shmueli (Computer Science Department, Technion)

SBD 2019: Session 4

Room: Veilingzaal **Time**: Friday 16:30-18:00

SBD 2019: the Fourth International Workshop on Semantic Big Data
Sven Groppe (University of Lübeck), Le Gruenwald (University of Oklahoma)

LDBC Technical User Community Meeting: session 3

Room: Ontvangkamer **Time**: Friday 16:30-18:00

LDBC Technical User Community Meeting
Peter Boncz (LDBC (CWI)), Alastair Green (LDBC (Neo4j))

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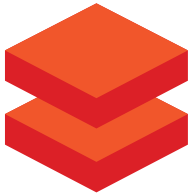

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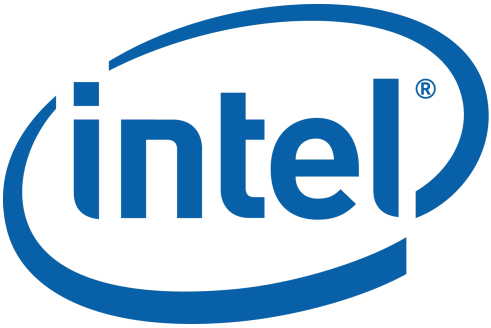

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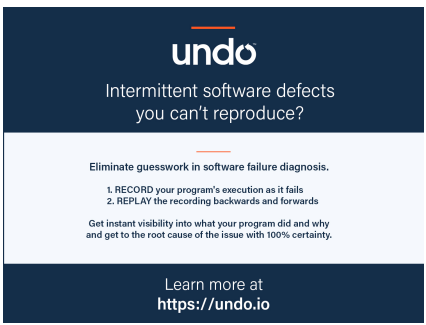

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