


# Proceedings of the VLDB Endowment

Volume 19, No. 13 – September 2026

**Editors in Chief:**

Yanlei Diao and Xiaokui Xiao

**Associate Editors:**

Alkis Polyzotis, Alkis Simitsis, Andrew Pavlo, Angela Bonifati, Anh Dinh, Antonis Deligiannakis, Ashraf Aboulnaga, Badrish Chandramouli, Bin Cui, Bogdan Cautis, Ce Zhang, Elena Ferrari, Evaggelia Pitoura, Fatemeh Nargesian, Guoliang Li, Hong Cheng, Immanuel Trummer, Jana Giceva, Jennie Rogers, Jian Pei, Jianliang Xu, Karima Echihabi, Katja Hose, Khuzaima Daudjee, Kunsoo Park, Kyuseok Shim, Laks Lakshmanan, Lei Cao, Lei Chen, Li Xiong, Mauro Sozio, Meihui Zhang, Melanie Herschel, Michael Böhlen, Nan Tang, Niv Dayan, Norman May, Raul Castro Fernandez, Raymond Chi-Wing Wong, Reynold Cheng, Ruben Mayer, Semih Salihoglu, Shimin Chen, Sibo Wang, Sourav S Bhowmick, Spyros Blanas, Steven Whang, Sudipto Das, Umar Farooq Minhas, Wei Wang, Wook-Shin Han, Yannis Velegrakis, Yanyan Shen, Yi Chen, Yuncheng Wu, Zhifeng Bao, Zi Huang

**Publication Editors:**

Andrea Mauri, Giovanni Simonini, Siqiang Luo, Stefan Halfpap, Subhadeep Sarkar

PVLDB – Proceedings of the VLDB Endowment

Volume 19, No. 13, September 2026.

All papers published in this issue will be presented at the 52nd International Conference on Very Large Data Bases, Boston, MA, USA, 2026.

# Copyright 2026 VLDB Endowment

This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit http://creativecommons.org/licenses/by-nc-nd/4.0/. For any use beyond those covered by this license, obtain permission by emailing info@vldb.org.

Volume 19, Number 13, September 2026

Pages i – ix and 4989 – 5313

ISSN 2150-8097

Available at: http://www.pvldb.org and https://dl.acm.org/journal/pvldb

# TABLE OF CONTENTS

**Front Matter**


Copyright Notice ..... i
Table of Contents ..... ii
PVLDB Organization and Review Board – Vol. 19 ..... iv
Letter from the Editors in Chief ..... ix


**Research Papers**


Reasoning about Transactional Isolation Levels with Isolde ..... *4989*
*Manuel Barros, Alcino Cunha, José Pereira, Eunsuk Kang*

Towards Effective Orchestration of AI x DB Workloads ..... *5003*
*Naili Xing, Haotian Gao, Zhanhao Zhao, Shaofeng Cai, Zhaojing Luo, Yuncheng Wu, Zhongle Xie, Meihui Zhang, Beng Chin Ooi*

BitEngine: Rethinking Query Processing with Bitmap Indexes ..... *5011*
*Junchang Wang, Fei Gao, Fu Xiao, Manos Athanassoulis*

Using Lower-Bound Representations for Trajectory Similarity Learning ..... *5025*
*Liwei Deng, Haotian Meng, Yupu Zhang, Yan Zhao, Torben Bach Pedersen, Kai Zheng, Christian S. Jensen*

DiskVecLab: A Deployment-Realistic Evaluation Framework for Disk-Based Vector Search ..... *5038*
*Yuxiang Wang, Yongxin Tong, Shuyuan Li, Zimu Zhou, Ziyuan He, Yu Sun, Xianhai Li, Yu Li*

VectorMaton: Efficient Vector Search with Pattern Constraints via an Enhanced Suffix Automaton ..... *5052*
*Haoxuan Xie, Siqiang Luo*

HyperJoin: LLM-augmented Hypergraph Link Prediction for Joinable Table Discovery ..... *5066*
*Shiyuan Liu, Jianwei Wang, Xuemin Lin, Lu Qin, Wenjie Zhang, Ying Zhang*

ZKP-SPARQL: Zero-Knowledge Proofs for SPARQL Query Verification ..... *5080*
*Quan Nguyen, Barbara Carminati, Elena Ferrari*

Scalable Graph Kernel Query with Error Guarantees ..... *5093*
*Changan Liu, Haoyu Liu, Siqiang Luo, Laks Lakshmanan*

Transformations for Evolving Property Graph Schemas ..... *5107*
*Gauvain Devillez, Stefania Dumbrava, Angela Bonifati*

Sketched Sum-Product Networks for Joins ..... *5120*
*Brian Tsan, Abylay Amanbayev, Asoke Datta, Florin Rusu*

Arming Data Agents with Tribal Knowledge ..... *5134*
*Asim Biswal, Shubham Agarwal, Sepanta Zeighami, Joseph Gonzalez, Aditya Parameswaran, Alvin Cheung*

Transactional Data Change for Realtime Analytics in Lakehouses ..... *5148*
*Dongyang Geng, Haoqiong Bian, Zinuo Li, Haoyue Li*

Automatically Proving Commutativity to Improve Transaction Chopping ..... *5162*
*Yanjun Chen, Juncheng Fang, Farzad Habibi, Brian Demsky, Faisal Nawab*

Structure Sparsification and Sparsity Estimation for Efficient Sparse Matrix Multiplication..... *5175*
*Guanghao Liang, Yixiang Fang*

Trident: Adaptive Scheduling for Heterogeneous Multimodal Data Pipelines..... *5189*
*Ding Pan, Zhuangzhuang Zhou, Long Qian, Binhang Yuan*

Hamilton: Learning Ontologies from Relational Databases..... *5203*
*Lukas Laskowski, Felix Draxler, Michael Hladik, Fabian Panse, Jan Portisch, Padhraic Smyth, Felix Naumann*

Beyond Latency: Provisioning-Aware Query Routing Across Heterogeneous Lakehouse Engines..... *5216*
*Shaswat Gupta, Michael Nidd, Ioana Giurgiu*

Pneuma-Seeker: Relational Reification of Information Needs for Agentic Data Discovery and Preparation
..... *5230*
*Muhammad Imam Luthfi Balaka, John Hillesland, Kemal Badur, Raul Castro Fernandez*

Disk-Resident Graph ANN Search: An Experimental Evaluation..... *5244*
*Xiaoyu Chen, Jinxiu Qu, Yitong Song, Shuhang Lu, Huiling Li, Minghui Jiang, Wei Zhou, Jianliang Xu, Xuanhe Zhou, Fan Wu*

Cassandra: Consensus with Partial Progress via Robust Partitionable View Synchronization..... *5258*
*Shaokang Xie, Dakai Kang, Junchao Chen, Suyash Gupta, Mohammad Sadoghi*

Thought Mining for Large Language Model Reasoning..... *5272*
*Xi Wang, Zixiao Huang, Tailai Zhang, Yuhua Tang, Ruochun Jin*

CATune: Structural Constraint-Aware Bayesian Optimization for DBMS Configuration Tuning..... *5286*
*Fangping Lan, Qi Zhang, Eduard Dragut*

High-throughput JSONPath Query Execution on Neural Processing Units..... *5300*
*Hexiang Geng, Jorin Tielen, Tiziano De Matteis, Daniele Bonetta*

# PVLDB ORGANIZATION AND REVIEW BOARD - Vol. 19

**Editors in Chief of PVLDB**
Yanlei Diao (Ecole Polytechnique and Amazon Web Services)
Xiaokui Xiao (National University of Singapore)

**Associate Editors of PVLDB**
Alkis Polyzotis (Databricks)
Alkis Simitsis (Athena Research Center)
Andrew Pavlo (Carnegie Mellon University)
Angela Bonifati (Univ. of Lyon)
Anh Dinh (Deakin University)
Antonis Deligiannakis (Technical University of Crete)
Ashraf Aboulnaga (University of Texas at Arlington)
Badrish Chandramouli (Microsoft Research)
Bin Cui (Peking University)
Bogdan Cautis (University of Paris-Saclay)
Ce Zhang (University of Chicago)
Elena Ferrari (University of Insubria, Varese)
Evaggelia Pitoura (Univ. of Ioannina)
Fatemeh Nargesian (University of Rochester)
Guoliang Li (Tsinghua University)
Hong Cheng (Chinese University of Hong Kong)
Immanuel Trummer (Cornell University)
Jana Giceva (TU Munich)
Jennie Rogers (Northwestern University)
Jian Pei (Duke University)
Jianliang Xu (Hong Kong Baptist University)
Karima Echihabi (Mohammed VI Polytechnic University)
Katja Hose (TU Wien)
Khuzaima Daudjee (University of Waterloo)
Kunsoo Park (Seoul National University)
Kyuseok Shim (Seoul National University)
Laks Lakshmanan (The University of British Columbia)
Lei Cao (University of Arizona)
Lei Chen (Hong Kong University of Science and Technology)
Li Xiong (Emory University)
Mauro Sozio (Luiss University of Rome)
Meihui Zhang (Beijing Institute of Technology)
Melanie Herschel (Nanyang Technological University)
Michael Böhlen (University of Zurich)
Nan Tang (HKUST (GZ))
Niv Dayan (University of Toronto)
Norman May (SAP SE)
Raul Castro Fernandez (The University of Chicago)
Raymond Chi-Wing Wong (Hong Kong University of Science and Technology)
Reynold Cheng (The University of Hong Kong, China)
Ruben Mayer (University of Bayreuth)
Semih Salihoglu (University of Waterloo)
Shimin Chen (Chinese Academy of Sciences)
Sibo Wang (The Chinese University of Hong Kong)
Sourav S Bhowmick (Nanyang Technological University)
Spyros Blanas (The Ohio State University)
Steven Whang (KAIST)
Sudipto Das (Amazon Web Services)
Umar Farooq Minhas (Apple)
Wei Wang (ByteDance)
Wook-Shin Han (POSTECH)
Yannis Velegrakis (Utrecht University)
Yanyan Shen (Shanghai Jiao Tong University)
Yi Chen (NJIT)
Yuncheng Wu (Renmin University of China)
Zhifeng Bao (The University of Queensland)
Zi Huang (University of Queensland)

**Publication Editors**
Andrea Mauri (Lyon 1 University)
Giovanni Simonini (University of Modena and Reggio Emilia)
Siqiang Luo (Nanyang Technological University)
Stefan Halfpap (TU Berlin)
Subhadeep Sarkar (Brandeis University)

**PVLDB Managing Editor**
Jun Yang (Duke University)

**PVLDB Advisory Board**
Alexandra Meliou (University of Massachusetts Amherst)
Divesh Srivastava (AT&T Labs - Research)
Fatma Ozcan (Google)
Felix Naumann (HPI)
Katja Hose (Technische Universität Wien)
Lei Chen (Hong Kong University of Science and Technology)
Matthias Boehm (Technische Universität Berlin)
Meihui Zhang (Beijing Institute of Technology)
Nesime Tatbul (Intel Labs and MIT)
Sourav S. Bhowmick (Nanyang Technological University)
Themis Palpanas (Universite Paris Cite)
Torsten Grust (University of Tuebingen)
Vanessa Braganholo (Universidade Federal Fluminense)
Wolfgang Lehner (TU Dresden)
Xiaokui Xiao (National University of Singapore)
Xin Luna Dong (Meta)
Yanlei Diao (Ecole Polytechnique, Amazon Web Services)

**Review Board**

Abhishek Roy (Microsoft)
Ahmed Aly (Google)
Ahmed Eldawy (University of California, Riverside)
Ahmed Mahmood (Google)
Alberto Lerner (Computing Flows GmbH)
Alberto Sonnino (MystenLabs & University College London)
Alexander Artikis (University of Piraeus)
Alexander Böhm (SAP SE)
Alexander Krause (TU Dresden)
Amarnadh Sai Eluri (Google)
Amelie Marian (Rutgers University)
Amine Mhedhbi (Polytechnique Montréal)
Amir Shaikhha (University of Edinburgh)
Amr Magdy (University of California Riverside)
Andrea Mauri (Lyon 1 University)
Andreas Züfle (Emory University)
Antonio Boffa (EPFL)
Arash Termehchy (Oregon State University)
Arijit Khan (Bowling Green State University)
Aristides Gionis (KTH Royal Institute of Technology)
Arkaprava Saha (University of Tsukuba)
Arnab Phani (TU Berlin)
Arnd Christian König (Microsoft)
Avinash Kumar (Google)
Baihua Zheng (Singapore Management University)
Berthold Reinwald (IBM Research - Almaden)
Bin Yang (Aalborg University)
Bo Tang (Southern University of Science and Technology)
Bo Zhao (Aalto University)
Bobbi W Yogatama (NVIDIA)
Bojan Karlaš (Harvard University)
Boris Glavic (University of Illinois Chicago)
Brian Kroth (Microsoft)
Brit Youngmann (Technion)
Calisto Zuzarte (IBM)
Carlo Curino (Microsoft)
Chang Ge (University of Minnesota)
Chao Zhang (University of Waterloo)
Chen Zhang (The Hong Kong Polytechnic University)
Cheng Long (Nanyang Technological University)
Chenghao Lyu (Amazon)
Chengkai Li (The University of Texas at Arlington)
Chengliang Chai (Beijing Institute of Technology)
Chenhao Ma (The Chinese University of Hong Kong, Shenzhen)
Christan Grant (University of Florida)
Christos Doulkeridis (University of Piraeus)
Christos Koutras (New York University)
Chrysanthi Kosyfaki (The University of Hong Kong)
Chuan Lei (Oracle)
Chunwei Liu (MIT CSAIL)
Cindy Chen (University of Massachusetts Lowell)
Cong Yue (National University of Singapore)
Daniel Kang (UIUC)
Daniel Ritter (SAP)
Davood Rafiei (University of Alberta)
Demetris Zeinalipour (University of Cyprus)
Dimitrios Skoutas (Athena Research Center)
Dixin Tang (The University of Texas, Austin)
Domagoj Vrgoč (PUC)
Dominik Durner (CedarDB)
Donatella Firmani (Sapienza University)
Donato Tiano (Università degli Studi di Modena e Reggio Emilia)
Dong Deng (Alibaba Cloud Computing)
Dong Xie (Penn State University)
Dumitrel Loghin (OKX)
Eduard Dragut (Temple Univ.)
Egemen Tanin (University of Melbourne)
El Kindi Rezig (University of Utah)
Eleni Tzirita Zacharatou (Hasso Plattner Institute (HPI))
Eliana Pastor (Politecnico di Torino)
Elisa Bertino (Purdue University)
Enzo Veltri (Università della Basilicata)
Ergute Bao (Mohamed bin Zayed University of Artificial Intelligence)
Eser Kandogan (Megagon Labs)
Essam Mansour (Concordia University)
Farnoush Banaei-Kashani (University of Colorado Denver)
Felix M Schuhknecht (Johannes Gutenberg University Mainz)
Florian Hahn (University of Twente)
Florin Rusu (UC Merced)
Francesco Gullo (University of L'Aquila)
Fuad Jamour (Amazon Web Services)
Gao Cong (Nanyang Technological University)
Garima Gaur (Inria Saclay, Ecole Polytechnique)
Gengrui Zhang (Concordia University)
George Christodoulou (TU Delft)
George Papadakis (University of Athens)
George Papastefanatos (ATHENA Research Center)
Georgios Siachamis (Inria)
Georgios R Theodorakis (Nvidia)
Giorgio Vinciguerra (Università di Pisa)
Giuseppina Andresini (University of Bari Aldo Moro)
Goce Trajcevski (Iowa State University)
Grigorios Loukides (King's College London)
Guido Moerkotte (University of Mannheim)
Guillaume Lachaud (Ecole Polytechnique)
Haibo Hu (Hong Kong Polytechnic University)
Haipeng Dai (Nanjing University)
Hannes Voigt (Neo4j)
Hantian Zhang (Google)
Hanzhi Wang (University of Copenhagen)
Haralampos Gavriilidis (BIFOLD & Technische Universität Berlin)
Haridimos Kondylakis (FORTH-ICS & Computer Science Department, University of Crete)
Harry Kai-Ho Chan (The University of Sheffield)
Hazar Harmouch (University of Amsterdam)
Herald Kllapi (Google Inc)
Hongzhi Wang (Harbin Institute of Technology)
Hua Lu (Aalborg University)
Huanchen Zhang (Tsinghua University)
Huiping Chen (University of Birmingham)
Hyungsoo Jung (Seoul National University)
Hyunjoon Kim (Hanyang University)
Ibrahim Sabek (University of Southern California)

Igor Zablotchi (Mysten Labs)
Ilia Petrov (Reutlingen University)
Ilias Azizi (Mohammed VI Polytechnic University)
Ilie Sarpe (KTH Royal Institute of Technology)
Indrakshi Ray (Colorado State University)
Ioannis Demertzis (UCSC)
Jaeyoung Do (Seoul National University)
Jan Hidders (Birkbeck, University of London)
Jeeta Ann Chacko (Technical University of Munich)
Jeffrey Xu Yu (The Hong Kong University of Science and Technology (Guangzhou))
Jelle Hellings (McMaster University)
Jesús Camacho-Rodríguez (Microsoft)
Jia Li (Hong Kong University of Science and Technology)
Jia Zou (Arizona State University)
Jialin Ding (Princeton University)
Jianguo Wang (Purdue University)
Jiannan Wang (Tsinghua University)
Jianxin Li (Edith Cowan University)
Jiawei Jiang (Wuhan University)
Jieming Shi (The Hong Kong Polytechnic University)
Jignesh Patel (Carnegie Mellon University)
Jin Wang (Arizona State University)
Jiwon Seo (Seoul National University)
Johannes Pietrzyk (TU Dresden)
Johes Bater (Tufts University)
John Paparrizos (The Ohio State University, USA & Aristotle University of Thessaloniki, Greece)
Jonathan Fürst (ZHAW Zurich University of Applied Sciences)
Jonghyeok Park (Korea University)
Joseph Near (University of Vermont)
Ju Fan (Renmin University of China)
Junghoon Kim (UNIST)
Junhao Gan (University of Melbourne)
K. Selçuk Candan (Arizona State University)
Kaisong Huang (University of Calgary)
Kai-Uwe Sattler (TU Ilmenau)
Kanchan Chowdhury (Marquette University)
Karim Benouaret (Univ Lyon)
Katsiaryna Mirylenka (Zalando SE)
Kaustubh Beedkar (Indian Institute of Technology Delhi)
Keke HUANG (The University of British Columbia)
Kenneth A Ross (Columbia University)
KI HYUN TAE (Samsung Research)
Kostas Stefanidis (Tampere University)
Kurt Stockinger (Zurich University of Applied Sciences)
Kwanghyun Park (Yonsei University)
Kyoungmin Kim (EPFL)
Larissa Capobianco Shimomura (Hasselt University)
Le Gruenwald (The University of Oklahoma)
Lefteris Kokoris Kogias (MystenLabs)
Lei Zou (Peking University)
Leong Hou U (University of Macau)
Leopoldo Bertossi (Carleton University)
Liang Liang (EPFL)
Lingyang Chu (McMaster University)
Loredana Caruccio (University of Salerno)
Lu Chen (Zhejiang University)
Luca Gagliardelli (eCampus University)
Lucas Braun (Oracle Labs)
Lukasz Golab (University of Waterloo)
Madhulika Mohanty (Inria & Institut Polytechnique de Paris)
Magnus Mueller (AWS)
Mahdi Esmailoghli (HU Berlin)
Makoto Onizuka (Osaka University)
Man Lung Yiu (Hong Kong Polytechnic University)
Manuel Rigger (National University of Singapore)
Marco Patella (University of Bologna)
Markos Markakis (Massachusetts Institute of Technology)
Martin Prammer (Carnegie Mellon University)
Matteo Ceccarello (University of Padova)
Matteo Interlandi (Microsoft)
Matthaios Olma (MongoDB)
Matthew J Perron (Microsoft)
Matthias Boehm (Technische Universität Berlin)
Matthias Weidlich (Humboldt-Universität zu Berlin)
Maximilian E Schüle (University of Bamberg)
Meichun Hsu (Oracle America)
Miao Qiao (The University of Auckland)
Miao Yu (Meta)
Michael J Cahill (University of Sydney)
Michael Grossniklaus (University of Konstanz)
Michael Gubanov (Florida State University)
Michael J Mior (Rochester Institute of Technology)
Mohamed Eltabakh (Qatar Foundation)
Mohamed Mokbel (University of Minnesota - Twin Cities)
Mohammad Sadoghi (University of California, Davis)
Mohammad Javad Amiri (Stony Brook University)
Mohammed J Saeed (Apple)
Mostafa Milani (The University of Western Ontario)
Nick Koudas (University of Toronto)
Nikolay Yakovets (TU Eindhoven)
Oktie Hassanzadeh (IBM Research)
Oliver A Kennedy (University at Buffalo, SUNY)
Oscar Romero (Universitat Politècnica de Catalunya)
Panagiotis Bouros (Johannes Gutenberg University Mainz)
Panagiotis Karras (University of Copenhagen)
Paolo Garza (Politecnico di Torino)
Paolo Merialdo (Università degli Studi Roma Tre)
Paolo Missier (University of Birmingham)
Paolo Papotti (EURECOM)
Patrick Damme (Technische Universität Berlin)
Patrick Schäfer (Humboldt-Universität zu Berlin)
Paul Boniol (Inria, Ecole normale supérieure)
Peizhi Wu (University of Pennsylvania)
Peng Peng (Hunan University)
Periklis Chrysogelos (Oracle)
Peter M. Fischer (University of Augsburg)
Pierangela Samarati (Universita degli Studi di Milano)
Prashant Pandey (Northeastern University)
Protiva Rahman (University of Florida)
Qingqing Ye (Hong Kong Polytechnic University)
Qitong Wang (Harvard University)
Qizhen Zhang (University of Toronto)
Rada Chirkova (NC State University)
Rainer Gemulla (Universität Mannheim)

Rana Alotaibi (King Abdulaziz City for Science and Technology (KACST))
Rana Shahout (Harvard)
Renata Borovica-Gajic (University of Melbourne)
Renchi Yang (Hong Kong Baptist University)
Ria Borromeo (University of Philippines)
Riccardo Torlone (Roma Tre University)
Rihan Hai (TU Delft)
Ritesh Sarkhel (Amazon)
Roee Shraga (WPI)
Romila Pradhan (Purdue University)
Ruiyuan Li (Chongqing University)
Ryan Marcus (University of Pennsylvania)
Ryan McKenna (University of Massachusetts Amherst)
Sai Wu (Zhejiang University)
Sara Foresti (Universita' degli Studi di Milano)
Sarah Kleest-Meißner (Hasselt University)
Sebastian Link (University of Auckland)
Sebastian Michel (RPTU Kaiserslautern-Landau)
Sepanta Zeighami (University of California Berkeley)
Shantanu Sharma (New Jersey Institute of Technology)
Shaoxu Song (Tsinghua University)
Sharad Mehrotra (U.C. Irvine)
Shen Liang (Université Paris Cité)
Shihabur Chowdhury (Apple)
Shimin Di (The Hong Kong University of Science and Technology)
Silviu Maniu (Université Grenoble Alpes)
Siqiang Luo (Nanyang Technological University)
Søren Kejser Jensen (Aalborg University)
Soror Sahri (Université Paris Cité)
Stavros Maroulis (ATHENA Research Center)
Stefania Dumbrava (ENSIIE, INRIA, IRIF, Télécom-SudParis)
Stefano Marchesin (Università di Padova)
Stefano Paraboschi (Universita' degli Studi di Bergamo)
Steffen Zeuch (TU Berlin)
Surajit Chaudhuri (Microsoft)
Suyash Gupta (University of Oregon)
Sven Groppe (Universität zu Lübeck/Institute of Information Systems (IFIS))
Tanzima Hashem (Bangladesh University of Engineering and Technology)
Tarique Ashraf Siddiqui (Microsoft Corporation)
Tenindra Abeywickrama (RIKEN Center for Computational Science)
Theodoros Chondrogiannis (Norwegian University of Science and Technology (NTNU))
Thomas Neumann (TUM)
Tianyi Li (Aalborg University)
Tianzheng Wang (Simon Fraser University)
Tieying Zhang (Bytedance)
Ting Yu (MBZUAI)
Tingjian Ge (University of Massachusetts, Lowell)
Tong Chen (The University of Queensland)
Torben Bach Pedersen (Aalborg University)
Tristan Allard (Univ Rennes, CNRS, IRISA)
Tsz Nam Chan (Shenzhen University)
Ulf Leser (Humboldt-Universität zu Berlin)
Utku Sirin (Harvard University)
Venkata Vamsikrishna Meduri (IBM Research-Almaden)
Verena Kantere (University of Ottawa)
Vikram Nathan (Amazon, Inc.)
Viktor Leis (Technische Universität München)
Vivek Narasayya (Microsoft)
Vivek Shah (Samsung)
Wang-Chien Lee (Pennsylvania State University, USA)
Wei Dong (Nanyang Technological University)
WEI LU (Renmin University of China)
Weiguo Zheng (Fudan University)
Wenqi FAN (The Hong Kong Polytechnic University)
Wentao Wu (Microsoft Research)
Wentao Zhang (Peking University)
William Schultz (MongoDB)
Xiang Lian (Kent State University)
Xiangyao Yu (University of Wisconsin-Madison)
Xiangyu Ke (Zhejiang University)
Xiao Qin (Snowflake)
Xiao Yan (Wuhan University)
Xiaofei Zhang (University of Memphis)
Xiaohui Yu (York University)
Xiaoou Ding (Harbin Institute of Technology)
Xiaoying Wang (Microsoft)
Xike Xie (University of Science and Technology of China)
Xin Huang (Hong Kong Baptist University)
Xuhao Chen (MSU)
Xun Jian (Northwestern Polytechnical University)
Xupeng Miao (Purdue University)
Yael Amsterdamer (Bar-Ilan University)
Yan Huang (University of North Texas)
Yang Cao (Institute of Science Tokyo)
Yang Wang (The Ohio State University)
Yao Lu (NUS)
Yesdaulet Izenov (Nazarbayev University)
Yeye He (Microsoft Research)
Yifan Wang (University of Hawaii)
Yihao Ang (National University of Singapore)
Yin Yang (Hamad bin Khalifa University)
Yinan Li (Microsoft Research)
Yinghui Wu (Case Western Reserve University)
Yingtai Xiao (TikTok)
Yiwen Zhu (Microsoft)
Yixiang Fang (School of Data Science, The Chinese University of Hong Kong, Shenzhen)
Yongjoo Park (UIUC)
Yongluan Zhou (University of Copenhagen)
Yongxin Tong (Beihang University)
Yu Yang (City University of Hong Kong)
Yuan Qiu (Southeast University)
Yujie Hui (Google)
Yuke Wang (Rice University)
Yuyu Luo (HKUST (GZ))
Zeyu Ding (Binghamton University)
Zhao Cao (Remin University of China)
Zhaojing Luo (Beijing Institute of Technology)
Zhengjie Miao (Simon Fraser University)
Zhewei Wei (Renmin University of China)
Zhiwei Fan (Meta)
Zhongle Xie (Zhejiang University)
Zhuoyue Zhao (University at Buffalo)
Zoi Kaoudi (IT University of Copenhagen)

**Light Load Review Board**

Abdulhakim Qahtan (Utrecht University)
Abolfazl Asudeh (University of Illinois Chicago)
Ahmed El-Roby (Carleton University)
Alberto Abelló (Universitat Politècnica de Catalunya)
Alex Conway (Cornell Tech)
Alexander Erben (Technical University of Munich)
Alexandros Labrinidis (University of Pittsburgh)
Anupam Sanghi (TU Darmstadt)
Ariful Azad (Texas A&M University)
Babak Salimi (University of California at San Diego)
Baotong Lu (Microsoft Research)
Bettina Kemme (McGill University)
C. Seshadhri (UCSC)
Curtis Dyreson (Utah State University)
Danfeng Zhang (Duke University)
Daniel Kocher (University of Salzburg)
Davide Mottin (Aarhus University)
Fabian Panse (University of Augsburg)
Felix Naumann (Hasso Plattner Institute, University of Potsdam)
Haitao Yuan (Nanyang Technological University)
Hangdong Zhao (Microsoft)
Hideyuki Kawashima (Keio University)
Hongyan Chang (NUS)
Hongzhi Yin (The University of Queensland)
Ingo Müller (Google)
Jiaheng Lu (University of Helsinki)
Jinho Lee (Seoul National University)
Juan Sequeda (data.world)
Katia Papakonstantinopoulou (Athens University of Economics and Business)
Kexin Rong (Georgia Institute of Technology)
Konstantinos Mamouras (Rice University)
Kyriakos Mouratidis (Singapore Management University)
Lipeng Wan (Georgia State University)
Manolis Terrovitis (Athena Research Center)
Matteo Brucato (Microsoft Research)
Mayuresh Kunjir (Amazon AWS)
Michele Linardi (CYU)
Mo Sha (Alibaba Group)
Murat Demirbas (MongoDB Research)
Myeongjae Jeon (POSTECH)
Nikos Giatrakos (Technical University of Crete)
Odysseas Papapetrou (TU Eindhoven)
Panagiotis Liakos (Athens University of Economics and Business)
Panagiotis Liakos (University of Athens)
Panos Vassiliadis (University of Ioannina)
Paris Carbone (KTH Royal Institute of Technology)
Paul Groth (University of Amsterdam)
Pierre Bourhis (CNRS)
Quang-Trung Ta (National University of Singapore)
Rathijit Sen (Microsoft)
Remy Wang (University of California, Los Angeles)
Renzo Angles (Universidad de Talca)
Seokki Lee (University of Cincinnati)
Sergi Nadal (Universitat Politècnica de Catalunya)
Sivaprasad Sudhir (MIT)
Song Jiang (University of Texas, Arlington)
Sonia Bergamaschi (Università di Modena e Reggio Emilia)
Subarna Chatterjee (Datastax)
Subhadeep Sarkar (Brandeis University)
Sujaya Maiyya (University of Waterloo)
Supawit Chockchowwat (University of Illinois Urbana-Champaign)
Theodore Johnson (AT&T Labs - Research)
Thomas Fahringer (University of Innsbruck)
Thorsten Papenbrock (Philipps University of Marburg)
Vassilis J. Tsotras (UC Riverside)
Venkatesh Emani (Microsoft)
Wenjia He (University of Michigan)
Wolfgang Gatterbauer (Northeastern University)
Xingguang Chen (National University of Singapore)
Yogesh Simmhan (Indian Institute of Science (IISc), Bangalore)
Yuxin Tang (Rice University)
Zhe Jiang (University of Florida)
Ziawasch Abedjan (BIFOLD/TU Berlin)

## LETTER FROM THE EDITORS IN CHIEF

We are pleased to present the thirteenth and final issue of Volume 19 of the Proceedings of the VLDB Endowment (PVLDB).

This issue includes 24 papers spanning the following primary subject areas: Data Mining and Analytics (1); Data Privacy and Security (2); Database Engines (3); Database Performance and Manageability (3); Distributed Database Systems (1); Graph and Network Data (2); Information Integration and Data Quality (1); Machine Learning, AI, and Databases (8); Novel Database Architectures (1); and Specialized and Domain-Specific Data Management (2). Together, these papers represent a broad and diverse cross-section of the areas addressed by PVLDB.

A particularly prominent theme in this issue is the deepening integration between database systems and artificial intelligence. Several papers explore new approaches to data discovery, integration, and interaction in the AI era, including LLM-augmented joinable table discovery, ontology learning from relational databases, relational representations of information needs for agentic data preparation, and the incorporation of accumulated domain knowledge into data agents. Other contributions address the underlying systems challenges of AI-driven workloads, including effective orchestration of combined AI and database operations and adaptive scheduling of heterogeneous multimodal data pipelines. Notably, this issue also features work on thought mining for analyzing the reasoning processes of large language models, illustrating how data mining techniques can contribute to understanding AI-generated reasoning. Together, these contributions highlight the expanding role of data management in enabling AI applications, supporting agentic workflows, and providing new methods for analyzing and understanding AI systems.

At the same time, this issue underscores the continued importance of foundational database research and systems innovation. Several papers revisit core problems in transaction processing and query execution, including reasoning about transaction isolation levels, automatically proving commutativity to improve transaction chopping, bitmap-based query processing, and efficient processing of joins using sketched sum-product networks. Other contributions explore emerging architectural and performance challenges, including accelerating JSONPath query execution on neural processing units, supporting transactional data changes for real-time analytics in lakehouses, and provisioning-aware query routing across heterogeneous lakehouse engines. Further contributions advance automated DBMS configuration tuning through structural constraint-aware Bayesian optimization and distributed consensus through mechanisms that enable partial progress under network partitions. Together, these works demonstrate how advances in hardware, evolving system architectures, and increasingly demanding workloads continue to motivate new approaches to longstanding database problems.

Another notable aspect of this issue is its emphasis on specialized data processing, scalability, and rigorous evaluation. Several papers address vector search and high-dimensional data, including efficient vector retrieval with pattern constraints and systematic experimental evaluations of disk-based approximate nearest neighbor search, with particular attention to realistic deployment conditions. Other contributions address specialized data representations and processing techniques, including lower-bound representations for trajectory similarity learning, scalable graph kernel queries with error guarantees, and transformations for evolving property graph schemas. The issue also features work on verifiable SPARQL query processing using zero-knowledge proofs, highlighting the growing importance of combining data management with cryptographic techniques to establish trust in query results. Together, these contributions underscore the importance of combining algorithmic innovation with practical efficiency, correctness guarantees, and careful empirical evaluation as data management systems support increasingly diverse and complex workloads.

As we conclude Volume 19, we are encouraged by the breadth and vitality of the research presented throughout the volume. The contributions reflect a community that continues to advance the foundations of data management while actively responding to emerging challenges and opportunities, particularly those arising from the rapid evolution of AI. We hope that readers will find in this final issue both valuable technical advances and inspiration for future research.

We would like to thank all the authors who contributed to Volume 19, the reviewers and associate editors for their dedication and careful evaluations throughout the year, and the PVLDB publication team for their outstanding support in bringing the volume to completion.

Zhifeng Bao, Jana Giceva, and Kunsoo Park
Associate Editors of PVLDB Vol. 19

Yanlei Diao and Xiaokui Xiao
Editors-in-Chief of PVLDB Vol. 19
Program Chairs for VLDB 2026