

SIGMOD/PODS 2024: the most relevant conference in database systems will take place in Chile

- *For the first time in its more than 50-year history, the most influential event in the field of database systems will take place in Latin America, with Chile as the host country. The meeting is co-organized locally by the Universidad Católica de Chile and Inria Chile, with the goal of bringing together experts from the academia and the industry, all of them leaders in cutting-edge research on the theory and applications of large-scale digital data.*

Santiago, Chile. May 2024.- In June 2024, the attention of the experts in data science at a global level will be focused in Chile. Over six days of intensive work, more than 800 scientists from universities, research centers, and the tech industry from Chile and abroad will gather at the SIGMOD/PODS 2024 Conference in Santiago to address—both theoretically and practically—the challenges of managing large volumes of data.

"It is not by chance that Chile was chosen as the venue. For several decades, the Chilean scientific community has maintained a significant presence at this conference, with at least ten researchers regularly presenting their results at SIGMOD/PODS. Several of these works have received important awards at this event," says Pablo Barceló, director of the Institute of Mathematical and Computational Engineering at the Universidad Católica de Chile (IMC UC), researcher at the Millennium Institute for Foundational Research on Data (IMFD) and the National Center for Artificial Intelligence (Cenia), and co-chair of the local organizing committee of SIGMOD/PODS 2024.

Nayat Sánchez, director of Inria Chile and co-chair of the SIGMOD/PODS 2024 organizing committee, emphasizes that "it has involved a great effort to bring SIGMOD/PODS to Chile. The achievement of being the host of this conference is a recognition of the work of researchers who are considered leaders in its field in the region and the world. The reputation gained over the years has made it possible for our country to be the venue of this conference, a milestone that will further raise Chile's role in the data field."

Barceló adds that "for example, in Chile, research has been carried out that currently allows for the extraction of information and understanding of behavior from social media in a matter of seconds."

SIGMOD/PODS also attracts experts from tech companies that not only closely follow the advances made in database systems but also develop their own applied research,

such as Amazon, Apple, Huawei, Microsoft, Google, Alibaba, and Oracle, which are also official sponsors of the conference.

SCIENCE MADE IN CHILE AT SIGMOD/PODS 2024

Of the four keynotes at the conference, two are Chilean. Ricardo Baeza-Yates, full professor at the University of Chile and senior researcher at the IMFD, will address challenges and limitations in the area of data and machine learning. Marcelo Arenas, full professor at the Universidad Católica de Chile and researcher at the IMFD, will speak about his recent work on how to provide explanations for decisions made by artificial intelligence models.

Innovative applications and studies conducted by scientists from our country will be present at SIGMOD/PODS, with a particular focus on graph databases. These are models able to store interconnected information, allowing for faster and more accurate query results.

The advances aimed at improving graph databases query systems to provide not only precise information but also data richer in-depth and variety will be presented. The researchers involved are Diego Arroyuelo and Juan Reutter (Universidad Católica de Chile, IMFD); Benjamín Bustos, Aidan Hogan, and Gonzalo Navarro (Universidad de Chile, IMFD); and Adrián Gómez-Brandón (Universidad de La Coruña, Spain, IMFD).

Another presentation will feature MillenniumDB, a new search engine model and system for graph databases that has already proven to be two to ten times faster than other systems currently in use (such as Amazon's or Neo4j's). This innovation involves 14 researchers and engineers, led by Domagoj Vrgoč and Carlos Rojas (Universidad Católica de Chile, IMFD).

Aidan Hogan (Universidad de Chile, IMFD) and Domagoj Vrgoč (Universidad Católica de Chile, IMFD) will lead a tutorial on how to query large-scale graph databases.

REmatch, a tool capable of extracting information from a pattern in text documents, will also be presented at SIGMOD/PODS. REmatch was developed by Cristian Riveros and Domagoj Vrgoč, along with Vicente Calisto, Gustavo Toro, and Nicolás Van Sint Jan, all from the Universidad Católica de Chile and IMFD, and Kyle Bossonney (University of Oxford).

THE NOBELS OF COMPUTER SCIENCE

In the history of SIGMOD/PODS, several advancements have been discussed that are now essential for online commerce, search engines, social media, and even artificial intelligence. These findings have been so crucial that, in its five decades, four scientists have received the Turing Award, also known as the Nobel of Computer Science.

In the early years of this conference, in the '70s, several efforts were made to apply the seminal work developed by Edgar F. Codd, the creator of relational databases. These systems are used in every area that manages large volumes of information: banking, online shopping, health records systems, retail inventory management, and many more. His outstanding contribution is considered a landmark in the data science field at large, and Codd received the Turing Award in 1981.

In the 1980s, Jim Gray deepened Codd's research by addressing the issue of database integrity. His work was critical to developing systems that allowed multiple users to query information simultaneously. Today, it is the foundation for applications such as online banking transaction processing and e-commerce. Gray received the Turing Award in 1998.

The most recent laureate is Michael Stonebraker, who created new management systems that revolutionized the market, such as Postgres, which allows for connecting more complex and diverse information. His innovations are being applied by companies and services like Instagram, TripAdvisor, Uber, and Spotify, among many others. Stonebraker received the Turing Award in 2015 for his innovation in this field.

THE IMPACT OF THE WEB AND SOCIAL MEDIA

The following decades added more breakthroughs: in the '90s, the birth of the World Wide Web opened the way to new research fields, such as the creation of systems for extracting and exchanging information from large-scale data, an area where the work of Héctor García-Molina, from Stanford University (USA), stands out. He mentored the project of two doctoral students who revolutionized the internet: Sergei Brin and Larry Page, creators of Google.

"The 2000s is the decade when the term Big Data emerged. We were able to identify its challenges, such as the volume of information, production speed, and data diversity. This gave impulse to carry out research for new methods and systems for fields like astronomy or DNA sequencing," explains Pablo Barceló.

From 2010 to today, the advances made in artificial intelligence (AI) algorithms that use large data repositories have led part of the scientific community from SIGMOD/PODS to focus on the great challenge of AI bias.

"This urgent need has arisen to develop research on the responsible use of data and AI, studying the risks involved in manipulating large volumes of information to make decisions. Many of the works presented at SIGMOD/PODS address these challenges from a theoretical and applied perspective," concludes Nayat Sánchez.

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