Immanuel Trummer

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OVERVIEW

Immanuel Trummer is assistant professor for computer science at Cornell University. His research focuses on databases and data analysis. His publications were selected for “Best of VLDB”, for "Best of SIGMOD", for the ACM SIGMOD Research Highlight Award, and for publication in CACM as CACM Research Highlight.

ACADEMIC CAREER

2016-Present	**Assistant Professor for Computer Science** *Cornell University, Ithaca (NY), USA*
2010-2016	**PhD Student in Computer Science** *Advisor: Christoph Koch* *EPFL, Lausanne (VD), Switzerland*
2003-2010	**Double Diploma in Computer Science & Engineering** *University of Stuttgart (Germany) & Ecole Centrale de Nantes (France)*

AWARDS and HONORS

- Created online course receiving over a million views on YouTube
- Recipient of a Google grant for COVID-19 AI and Data Analytics Projects 2020
- Publication selected for Best of SIGMOD 2019
- PI of NSF-1910830 ("Regret-Bounded Query Evaluation via Reinforcement Learning")
- Recipient of Google Faculty Research Award 2018
- Publication selected as CACM Research Highlight
- Jim Gray Dissertation Award, Honorable Mention
- Recipient of Google Faculty Research Award 2016
- Selected for ACM SIGMOD Research Highlight Award 2015
- Invitation to publish in “Best of VLDB 2015” (VLDB Journal)

PUBLICATIONS

Conference Publications

VLDB'23	**ADOPT: Adaptively Optimizing Attribute Orders for Worst-Case Optimal Join Algorithms via Reinforcement Learning.** *Junxiong Wang, Immanuel Trummer, Ahmet Kara, Dan Olteanu.* *Conditionally Accepted.*
VLDB'23	**SkinnerMT: Parallelizing for Efficiency and Robustness in Adaptive Query Processing on Multicore Platforms.** *Ziyun Wei, Immanuel Trummer.*

CIDR'22	**Towards NLP-Enhanced Data Profiling Tools.** *Immanuel Trummer.*
AAAI'22	**Procrastinated Tree Search: Black-Box Optimization with Delayed, Noisy, and Multi-Fidelity Feedback.** *Junxiong Wang, Debabrota Basu, Immanuel Trummer.*
SIGMOD'22	**DB-BERT: A Database Tuning Tool That "Reads" the Manual.** *Immanuel Trummer.*
VLDB'22	**BABOONS: Black-Box Optimization of Data Summaries in Natural Language.** *Immanuel Trummer.*
VLDB'22	**CodexDB: Synthesizing Code for Query Processing from Natural Language Instructions Using GPT-3 Codex.** *Immanuel Trummer.*
VLDB'22	**UDO: Universal Database Optimization using Reinforcement Learning.** *Junxiong Wang, Immanuel Trummer, Debabrota Basu.*
ICDE'21	**Optimally Summarizing Data by Small Fact Sets for Concise Answers to Voice Queries.** *Immanuel Trummer, Connor Anderson.*
SIGMOD'21	**Demonstrating UDO: A Unified Approach for Optimizing Transaction Code, Physical Design, and System Parameters via Reinforcement Learning (Demo).** *Junxiong Wang, Immanuel Trummer, Debabrota Basu.*
SIGMOD'21	**Demonstrating Robust Voice Querying with MUVE: Optimally Visualizing Results of Phonetically Similar Queries (Demo).** *Immanuel Trummer.*
VLDB'21	**The Case for NLP-Enhanced Database Tuning: Towards Tuning Tools that "Read the Manual".** *Immanuel Trummer.*
VLDB'21	**Robust Voice Querying with MUVE: Optimally Visualizing Results of Phonetically Similar Queries.** *Ziyun Wei, Immanuel Trummer, Connor Anderson.*
CIDR'20	**BitGourmet: Deterministic Approximation via Optimized Bit Selection.** *Saehan Jo, Immanuel Trummer.*
SIGMOD'20	**Demonstration of BitGourmet: Data Analysis via Deterministic Approximation (Demo).** *Saehan Jo, Immanuel Trummer.*
VLDB'20	**Demonstration of ScroogeDB: Getting More Bang for the Buck with Deterministic Approximation in the Cloud (Demo).** *Saehan Jo, Jialing Pei, Immanuel Trummer.*
VLDB'20	**Mining an "Anti-Knowledge Base" from Wikipedia Updates with Applications to Fact Checking and Beyond** *Georgios Karagiannis, Immanuel Trummer, Saehan Jo, Shubham Khandelwal, Xuezhi Wang, Cong Yu.*
VLDB'20	**Scrutinizer: A Mixed-Initiative Approach to Large-Scale, Data-Driven Claim Verification.** *Georgios Karagiannis, Mohammed Saeed, Paolo Papotti, Immanuel Trummer.*
VLDB'20	**Demonstrating the Voice-Based Exploration of Large Data Sets with CiceroDB-Zero (Demo).** *Immanuel Trummer.*
VLDB'20	**Scrutinizer: Fact-Checking Statistical Claims (Demo).** *Georgios Karagiannis, Mohammed Saeed, Paolo Papotti, Immanuel Trummer.*

CIDR'19	**Data Vocalization with CiceroDB.** *Immanuel Trummer.*
SIGMOD'19	**Exact Cardinality Query Optimization with Bounded Execution Cost.** *Immanuel Trummer.*
SIGMOD'19	**A Holistic Approach for Query Evaluation and Result Vocalization in Voice-Based OLAP.** *Immanuel Trummer, Yicheng Wang, Saketh Mahankali.*
SIGMOD'19	**SkinnerDB: Regret-Bounded Query Evaluation via Reinforcement Learning.** *Immanuel Trummer, Junxiong Wang, Deepak Maram, Samuel Moseley, Saehan Jo, Joseph Antonakakis.*
SIGMOD'19	**Verifying Text Summaries of Relational Data Sets.** *Saehan Jo, Immanuel Trummer, Weicheng Yu, Xuezhi Wang, Cong Yu, Daniel Liu, Niyati Mehta.*
VLDB'19	**AggChecker: A Fact-Checking System for Text Summaries of Relational Data Sets (Demo).** *Saehan Jo, Immanuel Trummer, Weicheng Yu, Xuezhi Wang, Cong Yu, Daniel Liu, Niyati Mehta.*
VLDB'18	**SkinnerDB: Regret-Bounded Query Evaluation via Reinforcement Learning (Demo).** *Immanuel Trummer, Samuel Moseley, Deepak Maram, Joseph Antonakakis, Saehan Jo.*
VLDB'18	**Efficiently Vocalizing Large Time Series.** *Immanuel Trummer, Mark Bryan, Ramya Narasimha.*
SIGMOD'17	**Solving the Join Ordering Problem via Mixed-Integer Linear Programming.** *Immanuel Trummer, Christoph Koch.*
VLDB'17	**Data Vocalization: Optimizing Voice Output of Relational Data.** *Immanuel Trummer, Jiancheng Zhu, and Mark Bryan.*
SIGMOD'16	**A Fast Randomized Algorithm for Multi-Objective Query Optimization.** *Immanuel Trummer, Christoph Koch.*
VLDB'16	**Multiple Query Optimization on the D-Wave 2X Adiabatic Quantum Computer.** *Immanuel Trummer, Christoph Koch.*
VLDB'16	**Parallelizing Query Optimization on Shared-Nothing Architectures.** *Immanuel Trummer, Christoph Koch.*
SIGMOD'15	**Mining Subjective Properties on the Web.** *Immanuel Trummer, Alon Halevy, Hongrae Lee, Sunita Sarawagi, Rahul Gupta.*
SIGMOD'15	**An Incremental Anytime Algorithm for Multi-Objective Query Optimization.** *Immanuel Trummer, Christoph Koch.*
VLDB'15	**Multi-Objective Parametric Query Optimization.** *Immanuel Trummer, Christoph Koch.*
SIGMOD'14	**Approximation Schemes for Many-Objective Query Optimization.** *Immanuel Trummer, Christoph Koch.*
EDBT'13	**Utility-Driven Data Acquisition in Participatory Sensing.** *Mehdi Riahi, Thanasis Papaioannou, Karl Aberer, Immanuel Trummer.*
ICWS'11	**Optimizing the Tradeoff Between Discovery, Composition, and Execution Cost in Service Composition.** *Immanuel Trummer, Boi Faltings.*

ICSOC'11	**Dynamically Selecting Composition Algorithms for Economical Composition as a Service.** *Immanuel Trummer, Boi Faltings.*
SERVICES'11	**Towards Self-Organizing Service-Oriented Architectures.** *Walter Binder, Daniel Bonetta, Cesare Pautasso, Achille Peternier, Diego Milano, Heiko Schuldt, Nenad Stojnic, Boi Faltings, Immanuel Trummer.*
CloudCom'10	**Cost-Optimal Outsourcing of Applications into the Clouds** *Immanuel Trummer, Frank Leymann, Ralph Mietzner, Walter Binder.*

Journal Publications

TODS'21	**SkinnerDB: Regret-Bounded Query Evaluation via Reinforcement Learning.** *Immanuel Trummer, Junxiong Wang, Ziyun Wei, Deepak Maram, Samuel Moseley, Saehan Jo, Joseph Antonakakis, Ankush Rhayabhari.* **Best of SIGMOD.**
IEEE DEB'21	**WebChecker: Towards an Infrastructure for Efficient Misinformation Detection at Web Scale.** *Immanuel Trummer.*
SIGMOD Record'21	**Database Tuning Using Natural Language Processing.** *Immanuel Trummer.*
CACM'17	**Multi-Objective Parametric Query Optimization.** *Immanuel Trummer, Christoph Koch.* **CACM Research Highlight.**
SIGMOD Record'16	**Multi-Objective Parametric Query Optimization.** *Immanuel Trummer, Christoph Koch.* **SIGMOD Research Highlight.**
VLDBJ'15	**Multi-Objective Parametric Query Optimization.** *Immanuel Trummer, Christoph Koch.* **Best of VLDB.**
TSE'13	**Multi-Objective Quality-Driven Service Selection: A Fully Polynomial Time Approximation Scheme.** *Immanuel Trummer, Boi Faltings, Walter Binder.*

Patents

US Patent App. 62/582,053	**The Fact Checker: Verifying Text Summaries of Relational Data Sets.** *Immanuel Trummer.*
US Patent App. 15/920,436	**System and Methods to Hard-Code Integer Linear Optimization Problems on Physical Implementations of the Ising Model.** *Immanuel Trummer, Davide Venturelli.*

Theses

PhD Thesis	**From Massive Parallelization to Quantum Computing: Seven Novel Approaches to Query Optimization.** *Immanuel Trummer.* **Jim Gray Award, Honorable Mention.**
Diploma Thesis	**Cost-Optimal Provisioning of Cloud Applications.** *Immanuel Trummer.*

Tutorials

VLDB'22	**From DB-BERT to GPT-3 Codex: Harnessing the Potential of Very Large Language Models for Data Management.** *Immanuel Trummer.*

Workshop Papers

VLDB'22 PhD Workshop	**Building Learned, Federated Query Optimizers.** *Victor Giannakouris, Immanuel Trummer.*

TEACHING

- **CS 4320**: Introduction to Database Systems. (Yearly)
- **CS 4321**: Practicum in Database Systems. (Yearly)
- **CS 6320**: Advanced Database Systems. (Yearly)
- **CS 7390**: Seminar in Database Systems. (Once per Semester)

The **online course** "Introduction to Database Systems", created by Immanuel Trummer and available on YouTube (https://youtu.be/4cWkVbC2bNE), reached **over a million views**.

SERVICE

- Associate Editor of SIGMOD 2024
- Co-chaired the demo track at VLDB 2022
- Associate Editor of SIGMOD Record
- PC member at SIGMOD 2018, 2019, and 2020
- PC member at VLDB 2018, 2019, 2020, 2021, 2022, and 2023
- PC member at SoCC 2017
- PC member at SIGMOD 2016 Undergrad Competition

PhD STUDENTS

- Victor Giannakouris (since 2021)
- Saehan Jo (since 2018)
- Junxiong Wang (since 2019)
- Ziyun Wei (since 2018)