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Education

Ph.D. in Computer Science, Brown University, Rhode Island, 2021
Advisors: Stan Zdonik, Seny Kamara
Readers: George Kollios, Moti Yung
Thesis: *Building a Structurally-Encrypted Relational Database*

M.Sc. in Computer Science, Brown University, Rhode Island, 2016
Advisor: Stan Zdonik
Readers: Tim Kraska, Ugur Cetintemel
Thesis: *Approximate Data Structures for Visualization*

B.Sc. in Computer Science, University of Wisconsin at Madison, Wisconsin, 2012
Advisor: Jignesh Patel

Certification

Deep Learning Specialization, *Coursera / deeplearning.ai* [link]

Services

Reviewer: OSDI'16, TVCG'21, TODS'21

Program committee: VLDB'22 (Demo Track)

Member: IACR, ACM

Honors

Graduate Fellowship, Brown University, 2014-2019

Dean's Honor List, University of Wisconsin at Madison, 2007, 2008, 2009

Eta Kappa Nu, 2009

Upsilon Pi Epsilon, 2010

Golden Key International Honour Society, 2010

Dissertation Fellowship, Brown University, 2018-2019

Experiences

Technical University of Darmstadt, 2021

Postdoctoral research on secure federated learning and databases. Hosted by Prof. Carsten Binnig in Data Management Group

Los Alamos National Laboratory, 2019

Machine learning model reconstruction of mixed dynamics in cyber-physical systems, with application to network verification and security

Microsoft AI & Research, 2017

Constraint learning. Hosted by DMX Group

Intel Labs, 2015.

Efficiency of machine learning algorithms in Apache Spark

In-memory transactional processing using non-volatile memory

Hadapt (Acquired by Teradata), 2013

Enterprise SQL-on-Hadoop system including query execution, storage engine, high availability and analytics

Kosmix (Acquired by @WalmartLabs), 2012

In-memory distributed queue system for the in-house stream processing

Great Lakes Bioenergy Research Center, 2010

Scientific database for biological enzyme research

Thesis Supervision

Benedikt Völker, *Client-side Validation for Detecting the Model Poisoning Attack in Federated Learning*
M.Sc.'21, TU Darmstadt

Philipp Imporatori, *Building a Oblivious Relational Database*
M.Sc.'22, TU Darmstadt

Shan Li, *Gradient-based Attacks on Federated Learning*
M.Sc.'22, TU Darmstadt

Zhanglei Sun, *Practical Privacy-Preserving Federated Learning*
M.Sc.'22, TU Darmstadt

Teaching

Data Management Labs, TU Darmstadt, 2021.

Introduction to Database Systems, Brown University 2015, 2018

Advanced Topics in Database Systems, Brown University 2015

Preprints

P2Sharding: A New Parameter Server Framework for Privacy-Preserving Federated ML TU Darmstadt, 2021

An Optimal Relational Database Encryption Scheme [link]
Cryptology ePrint Archive: Report 2020/274

Learning of Cyber-Physical Systems
Advanced Network Science Initiative, Los Alamos National Laboratory, 2019

Behavior of Large Random Graph. [link]
Randomized Algorithms for Counting, Integration and Optimization, Brown University, 2017

Signal Search.[link]
Brown University, 2017

Publications

ACID-V: towards a New Class of DBMSs for Data Sharing
Polystores Workshop at VLDB, 2021

Encrypted Databases: from Theories to Systems
CIDR, January 2021

Dynamic Query Refinement for Interactive Data Exploration
EDBT/ICDT Joint Conference, March 2020

Investigating the Effect of the Multiple Comparisons Problem in Visual Analysis
CHI Conference, April 2018

Controlling False Discoveries During Interactive Data Exploration
SIGMOD Conference, May 2017

Safe Visual Data Exploration
SIGMOD Conference, Demo, May 2017

Bridging the Gap between HPC and Big Data frameworks
VLDB Journal, 2017

Towards Sustainable Insights
CIDR Conference, January 2017

Towards a Benchmark for Interactive Data Exploration
IEEE Data Engineering Bulletin, 2016.

Larger-than-memory Data Management on Modern Storage Hardware for In-memory OLTP Database Systems
SIGMOD DaMoN Workshop, June 2016

VisTrees: Fast Indexes for Interactive Data Exploration
SIGMOD HILDA Workshop, June 2016

Data Tiering in Heterogeneous Memory Systems
EuroSys Conference, April 2016

Software

ML framework for Cypber-physical Systems [link]

Encrypted Spark [link]

Encrypted Searchable Signal [link]

Macau: statistical hypothesis testing based on resampling [link]

Machine learning algorithms in Spark [link]

Consistency control for machine learning algorithms [link]

R-tree in Rust[link]

Spark performance analysis tool [link]

VoltDB on non-volatile memory [link]

Funding

NSF Award #1514491, *III: Medium: 20/20: A System for Human-in-the-Loop Data Exploration*, 2015 (Graduate RA)

NSF Award #1916335, *SBIR Phase I: Encrypted Databases: From Theory to Systems*, 2019 (Graduate RA)

References

Available upon request.