Faisal Nawab

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Research Interests

My research lies at the intersection of **data management** and **distributed systems**. I lead the EdgeLab at the University of California, Irvine (UCI), where we aim to build Edge-Cloud Data Management (ECDM) systems to support emerging Internet of Things (IoT) and edge applications.

Employment

2021–	Assistant Professor of Computer Science
	The University of California, Irvine
2018–2020	Assistant Professor of Computer Science and Engineering
	The University of California, Santa Cruz
2014–2016	Research Associate - Systems Group
	Hewlett-Packard (HP) Labs, Palo Alto, CA
Summer	Research Intern - Database Group
2013	Microsoft Research (MSR), Redmond, WA

Education

2012-2018	Ph.D. in Computer Science - The University of California, Santa Barbara
	Advisors: Divyakant Agrawal and Amr El Abbadi
	Dissertation topic: Global-Scale Data Management With Strong Transactional Guarantees
2009-2011	M.S. in Computer Science - University of Science and Technology (KAUST), Saudi Arabia
	Thesis title: TMAC: Timestamp-Ordered MAC for CSMA/CA Wireless Mesh Networks
	Advisor: Dr. Basem Shihada
2005-2009	B.S. in Computer Engineering - King Fahd University (KFUPM), Saudi Arabia

Teaching Experience

Graduate Student Mentoring

- *Farzad Habibi*, Ph.D. at UC Irvine (2021-now)
- *Juncheng Fang*, Ph.D. at UC Irvine (2021-now)
- *Saeed Kargar*, Ph.D. at UC Santa Cruz (2019-now)
- *BinBin Gu*, Ph.D. at UC Irvine (2019-now)
- *Samaa Gazzaz*, Ph.D. at UC Santa Cruz (2019-now)
- *Abhishek Singh*, Ph.D. at UC Irvine (2018-now)
- *Yinan Zhou*, Ph.D. at UC Irvine (2022-now)
- *Qi Lin*, M.S. at UC Irvine (2022–2023)
- *Yinan Zhou*, M.S. at UC Irvine (2021-now)
- *Natasha Mittal*, M.S. at UC Santa Cruz (2018-2020)
- *Bobby Dhillon*, M.S. at UC Santa Cruz (Spring 2020)
- *Abdurrahman Al-Omari*, M.S. at UC Santa Cruz (Spring 2020)

- *Aasim Khan*, M.S. at UC Santa Cruz (Spring 2020)

- *Yiwen Wang*, M.S. at UC Santa Cruz (Winter 2020)

- *Jie Yin*, M.S. at UC Santa Cruz (Winter 2020)

- *Jincheng Li*, M.S. at UC Santa Cruz (Fall 2019)

- *Kaixin Liu*, M.S. at UC Santa Cruz (Fall 2019)

- *Adil Rahman*, M.S. at UC Santa Cruz (Fall 2019)

- *Pengyang Zhou*, M.S. at UC Santa Cruz (Fall 2019)

- *Changsheng Liu*, M.S. at UC Santa Cruz (Spring 2019)

- *Kavya Jha*, M.S. at UC Santa Cruz (Spring 2018) Project: Global-Scale Permissioned Blockchain

- *Philipp Grulich*, (Exchange) M.S. at UC Santa Cruz (2017-2018)
  Project: An Analytics Pipeline for Edge Computing

- *Tanuj Mittal*, M.S. at UC Santa Barbara (2016-2017)
  Project: Reads Consistency in Globally Distributed Databases

- *Ravi Kumar*, M.S. at UC Santa Barbara (2016-2017)
  Project: Consensus with Globally Distributed Agents

- *Darshan Maiya*, M.S. at UC Santa Barbara (2016-2017)
  Project: Elastic Resource Allocation for Machine Learning Tasks

Undergraduate Student Mentoring

- *Haining Zhou*, B.S. at UC Irvine (Winter–Fall 2021)

- *Emily Madigan*, B.S. at UC Santa Cruz (Winter 2019)
  Project: Integrating LSM-Trees in Distributed Databases

- *Cody Cunningham*, B.S. at UC Santa Cruz (Winter 2019)
  Project: Secure File Systems Over Byzantine Fault-Tolerant Replication

- *Bobby Dhillion*, B.S. at UC Santa Cruz (Winter 2019)
  Project: Decentralized Messaging at Edge Nodes (Team project)

- *Thomas Pham*, B.S. at UC Santa Cruz (Winter 2019)
  Project: Decentralized Messaging at Edge Nodes (Team project)

- *Ryan Manseau*, B.S. at UC Santa Cruz (Winter 2019)
  Project: Decentralized Messaging at Edge Nodes (Team project)

- *Dylan Welch*, B.S. at UC Santa Cruz (Winter 2019)
  Project: Decentralized Social Networks

- *Ahmed Almutawa*, B.S. at UC Santa Cruz (Spring 2018)
  Project: Blockchain-based State Replication

- *Matthew Johnson*, B.S. at UC Santa Cruz (Spring 2018)
  Project: A Web-Based Interactive Framework for Distributed Algorithms Classes

- *Colin Biafore*, B.S. at UC Santa Barbara (2015-2016)
  Project: Graph Summarization for Social Networks Trends Detection
  ⋆ The work is presented at SIGMOD 2016 as part of the undergraduate research competition.
  ⋆ Colin is the Computer Science Department nominee for UCSB's Undergraduate Research Award.

- *Alan Buzdar*, M.S. at UC Santa Barbara (2016)
  Project: Processing Geo-Replicated Spatial Data

- *Emily Littleworth*, B.S. at UC Santa Barbara (2015)
  Project: Geo-Replication of Graph Databases

- *Charles Weng*, B.S. at UC Santa Barbara (2015)
  Project: Geo-Replication of Ordered Logs

High School Student Mentoring

- *Lalithsai Posam*, (2021)

Teaching

- Courses taught:

  - CS223: Transaction Processing and Distributed Data Management (Spring '22 and Fall '23 at UC Irvine)
  - CS122A: Introduction to Data Management (Spring '23)
  - CS295: Blockchain Systems (Spring '21 and Winter '22 at UC Irvine)
  - STATS170a: Projects in Data Science (Winter '22 and '23 at UC Irvine)
  - STATS170b: Projects in Data Science (Spring '22 and '23 at UC Irvine)
  - CSE130: Principles of Computer Systems Design (Fall '20 at UCSC)
  - CSE20: Beginning Programming in Python (Winter '20 at UCSC)
  - CSE214: Principles of Database Systems (Fall '19 at UCSC)
  - CSE130: Principles of Computer Systems Design (Fall '19 at UCSC)
  - CMPS111: Introduction to Operating Systems (Winter '19 at UCSC)
  - CMPS277: Principles of Database Systems (Winter '19 at UCSC)
  - CMPS111: Introduction to Operating Systems (Fall '18 at UCSC)
  - CMPS290S: Advanced Topics in Computer Systems (Winter '18 at UCSC)

- Teaching Assistant for a graduate level course (CS271: Advanced Topics in Distributed Systems)
  ★ Outstanding TA award by UC Santa Barbara's Computer Science department.

- Presented a 3-hour tutorial in SIGMOD 2016 and ICDE 2017
  Title: The Challenges of Global-Scale Data Management

- Presented as a guest lecturer for multiple courses:
  CMPS128 Distributed Systems (UCSC)
  CS271 Advanced Topics in Distributed Systems (UCSB)
  CS274 Advanced Topics in Databases (UCSB)
  CS171 Distributed Systems (UCSB)

Grants and Industry Funding

G8. *Collaborative Research: SaTC: CORE: Medium: Compliance as a Service (CaSe): A Reflective Approach to Enforcing User Privacy Regulations*
National Science Foundation (NSF) ($1,200,000; role: lead PI).

G7. *Modeling, Analysis, and Detection of Metastable Failures*
Roblox Research, $15,000 (2023).

G6. *Collaborative Research: CyberTraining: Pilot: Cybertraining to Develop FAIR Data Competencies for Bio-engineering Students*
National Science Foundation (NSF) ($300,000; role: lead PI).

G5. *BioDigitalTwin: Towards a Data Management Solution for Reproducible and Standardized Biomedical Protocol Development*
Academic Senate Council on Research, Computing and Libraries (CORCL) Award, $5,000 (2023).

G4. *CNS: Small: Data on the Edge: Leveraging Edge Datacenters for Low-latency, Fault-tolerant, mobile, Geo-replicated Transactional Data Stores*
National Science Foundation (NSF), Award number: 1815212, ($499,500) (2018–2022).

G4. *Travel: Request for Student Travel Support for ICDE 2023*
National Science Foundation (NSF), Award number: 2300205, ($25,000).

G3. *Building Global-Scale Systems Using a Flexible Consensus Substrate*
Facebook "Next-Generation Data Infrastructure" award, $50,000 (2021).

G2. *GLIDE: A Gestalt Approach to Live Data Engineering*
UCI ICS Research Award, $75,000 (2021).

G1. *A Blockchain-Based Case Tracking and Evaluation System for Medical Residency Programs*
Academic Senate Council on Research, Computing and Libraries (CORCL) Award, $5,000 (2021/2022).

Patents

X1. <u>Faisal Nawab</u>, Joseph Izraelevitz, Terence Kelly, Charles B. Morrey, and Dhruva Chakrabarti
Memory System to Access Uncorrupted Data
Patent Application Filed (March 2016)

Books

B1. Faisal Nawab, Mohammad Sadoghi
Consensus in Data Management: From Distributed Commit to Blockchain
Foundations and Trends in Databases, 2023.

Conference and journal publications

P49. <u>Faisal Nawab</u>, Moshe Shadmon
The Tipping Point of Edge-Cloud Data Management
The Conference on Innovative Data Systems Research **(CIDR)**, 2024.

P48. Vishal Chakraborty, Stacy Ann-Elvy, Sharad Mehrotra, <u>Faisal Nawab</u>, Mohammad Sadoghi, Shantanu Sharma, Nalini Venkatasubramanian, Farhan Saeed
Data-CASE: Grounding Data Regulations for Compliant Data Processing Systems
International Conference on Extending Database Technology **(EDBT)**, 2024.

P47. Saeed Kargar, <u>Faisal Nawab</u>
Hamming Tree: The case for Energy-Aware Indexing for NVMs
ACM International Conference on Management of Data **(SIGMOD)**, 2023.

P46. Abhishek Singh, Yinan Zhou, Mohammad Sadoghi, Sharad Mehrotra, Shantanu Sharma, <u>Faisal Nawab</u>
WedgeBlock: An Off-Chain Secure Logging Platform for Blockchain Applications
International Conference on Extending Database Technology **(EDBT)**, 2023.

P45. Abhishek Singh, Aasim Khan, Sharad Mehrotra, <u>Faisal Nawab</u>
TransEdge: Supporting Efficient Read Queries Across Untrusted Edge Nodes
International Conference on Extending Database Technology **(EDBT)**, 2023.

P44. Saeed Kargar, Binbin Gu, Sangeetha Abdu Jyothi, <u>Faisal Nawab</u>
E2-NVM: A Memory-Aware Write Scheme to Improve Energy Efficiency and Write Endurance of NVMs using Variational Autoencoders
International Conference on Extending Database Technology **(EDBT)**, 2023.

P43. Suyash Gupta, Sajjad Rahnama, Erik Linsenmayer, <u>Faisal Nawab</u>, Mohammad Sadoghi
Reliable Transactions in Serverless-Edge Architecture
IEEE International Conference on Data Engineering **(ICDE)**, 2023.

P42. Binbin Gu, Abhishek Singh, Yinan Zhou, Juncheng Fang, <u>Faisal Nawab</u>
ML on Chain: The Case and Taxonomy of Machine Learning on Blockchain
IEEE International Conference on Blockchain and Cryptocurrency **(ICBC)**, 2023.

P41. Tuan Tran, <u>Faisal Nawab</u>, Owen Arden, Peter Alvaro
Unstick Yourself: Recoverable Byzantine Fault Tolerant Services
IEEE International Conference on Blockchain and Cryptocurrency **(ICBC)**, 2023.

P40. Samaa Gazzaz, Vishal Chakraborty, <u>Faisal Nawab</u>
Croesus: Multi-Stage Processing and Transactions for Video-Analytics in Edge-Cloud Systems
IEEE International Conference on Data Engineering (**ICDE**), 2022.

P39. Binbin Gu, Saeed Kargar, <u>Faisal Nawab</u>
Efficient Dynamic Clustering: Capturing Patterns from Historical Cluster Evolution
International Conference on Extending Database Technology (**EDBT**), 2022.

P38. Saeed Kargar, <u>Faisal Nawab</u>
Challenges and future directions for Energy, Latency, and Lifetime Improvements in NVMs
Distributed and Parallel Databases Journal (**DAPD**), 2022.

P37. Hari Kishore Chaparala, Sai Vineeth Doddala, Ahmad Showail, Abhishek Singh, Samaa Gazzaz, <u>Faisal Nawab</u>
LiftChain: A Scalable Multi-Stage NFT Transaction Protocol
IEEE International Conference on Blockchain (**IEEE Blockchain**), 2022.

P36. Zane Karl, Hayden Freedman, Abhishek Singh, Ahmad Showail, Samaa Gazzaz, <u>Faisal Nawab</u>
You've Got a Friend in ME (Mobile Edge): Blockchain Processing with Cloud Node Backup
IEEE International Conference on Blockchain (**IEEE Blockchain**), 2022.

P35. Kevin C Bruhwiler, Fayzah Alshammari, Farzad Habibi, Juncheng Fang, Yinan Zhou, Abhishek Singh, Ahmad Showail, <u>Faisal Nawab</u>
Analyzing Soft and Hard Partitions of Global-Scale Blockchain Systems
IEEE International Conference on Blockchain (**IEEE Blockchain**), 2022.

P34. Juncheng Fang, Farzad Habibi, Kevin C Bruhwiler, Fayzah Alshammari, Abhishek Singh, Yinan Zhou, <u>Faisal Nawab</u>
PeloPartition: Improving Blockchain Resilience to Network Partitioning
IEEE International Conference on Blockchain (**IEEE Blockchain**), 2022.

P33. Michael Whittaker, Neil Giridharan, Adriana Szekeres, Joseph Hellerstein, Heidi Howard, <u>Faisal Nawab</u>, Ion Stoica
Matchmaker Paxos: A Reconfigurable Consensus Protocol
Journal of Systems Research (**JSys**), 2021.

P32. Saeed Kargar, Heiner Litz, <u>Faisal Nawab</u>
Predict and Write: Using K-Means Clustering to Extend the Lifetime of NVM Storage
IEEE International Conference on Data Engineering (**ICDE**), 2021.

P31. Natasha Mittal, <u>Faisal Nawab</u>
CooLSM: Distributed and Cooperative Indexing Across Edge and Cloud Machines
IEEE International Conference on Data Engineering (**ICDE**), 2021.

P30. <u>Faisal Nawab</u>
WedgeChain: A Trusted Edge-Cloud Store With Asynchronous (Lazy) Trust
IEEE International Conference on Data Engineering (**ICDE**), 2021.

P29. Oceane Bel, Sinjoni Mukhopadhyay, Nathan R. Tallent, <u>Faisal Nawab</u>, Darrell D. E. Long
WinnowML: Stable feature selection for maximizing prediction accuracy of time-based system modeling
IEEE International Conference on Big Data (**IEEE Big Data**) 2021.

P28. Daniel Abadi, Owen Arden, <u>Faisal Nawab</u>, Moshe Shadmon
AnyLog: a Grand Unification of the Internet of Things
Conference on Innovative Data Systems Research (**CIDR**), 2020.

P27. Oceane Bel, Kenneth Chang, Nathan R. Tallent, Dirk Duellmann, Ethan L. Miller, <u>Faisal Nawab</u> and Darrell D. E. Long
Geomancy: Automated Performance Enhancement through Data Layout Optimization
International Conference on Massive Storage Systems and Technology (**MSST**) 2020.

P26. Maha Alaslani, Osama Amin, <u>Faisal Nawab</u>, Basem Shihada
Rethinking Blockchain Integration with the Industrial Internet of Things
IEEE Internet of Things Magazine, 2020.

P25. Maha Alaslani, <u>Faisal Nawab</u>, Basem Shihada
Blockchain in IoT Systems: End-to-End Delay Evaluation
IEEE Internet of Things Journal (**IEEE IoT**), 2019.

P24. <u>Faisal Nawab</u>, Mohammad Sadoghi
Blockplane: A Global-Scale Byzantizing Middleware
IEEE International Conference on Data Engineering (**ICDE**), 2019.

P23. Sujaya Maiyya, <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
Unifying Consensus and Atomic Commitment for Effective Cloud Data Management
International Conference on Very Large Data Bases (**VLDB**), 2019.

P22. <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
DPaxos: Managing Data Closer to Users for Low Latency and Mobile Applications
ACM International Conference on Management of Data (**SIGMOD**), 2018.

P21. <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
Nomadic Datacenters at the Network Edge: Data Management Challenges for the Cloud with Mobile Infrastructure
International Conference on Extending Database Technology (**EDBT**), 2018.

P20. Victor Zakhary, <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
Global-Scale Placement of Transactional Data Stores
International Conference on Extending Database Technology (**EDBT**), 2018.

P19. Vaibhav Arora, <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
Janus: A Hybrid Scalable Multi-Representation Cloud Datastore
IEEE Transactions on Knowledge and Data Engineering (**TKDE**), 2018.

P18. <u>Faisal Nawab</u>, Vaibhav Arora, Victor Zakhary, Divyakant Agrawal, Amr El Abbadi
A System Infrastructure for Strongly Consistent Transactions on Globally-Replicated Data
IEEE Data Engineering Bulletin, 2017.

P17. <u>Faisal Nawab</u>, Joseph Izraelevitz, Terence Kelly, Charles B. Morrey, Dhruva Chakrabarti, Michael L. Scott
Dali: A Periodically Persistent Hash Map
The International Symposium on DIStributed Computing (**DISC**), 2017.

P16. Vaibhav Arora, <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
Typhon: Consistency Semantics for Multi-Representation Data Processing
IEEE International Conference on Cloud Computing (**CLOUD**), 2017.

P15. Vaibhav Arora, <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
Multi-Representation Based Data Processing Architecture for IoT Applications
IEEE International Conference on Distributed Computing (**ICDCS**), 2017.

P14. <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi, Sanjay Chawla
COP: Planning Conflicts for Faster Parallel Transactional Machine Learning
International Conference on Extending Database Technology (**EDBT**), 2017.

P13. <u>Faisal Nawab</u>, Vaibhav Arora, Divyakant Agrawal, Amr El Abbadi
Minimizing Commit Latency of Transactions in Geo-Replicated Data Stores
ACM International Conference on Management of Data (**SIGMOD**), pages 1279–1294, 2015.

P12. David Lomet, <u>Faisal Nawab</u>
High Performance Temporal Indexing on Modern Hardware
IEEE International Conference on Data Engineering (**ICDE**), pages 1203–1214, 2015.
⋆ Selected as one of the best papers in ICDE.

P11. <u>Faisal Nawab</u>, Vaibhav Arora, Divyakant Agrawal, Amr El Abbadi
Chariots: A Scalable Shared Log for Data Management in Multi-datacenter Cloud Environments
International Conference on Extending Database Technology (**EDBT**), pages 13–24, 2015.

P10. <u>Faisal Nawab</u>, Dhruva Chakrabarti, Terence Kelly, Brad Morrey
Procrastination Beats Prevention: Timely Sufficient Persistence for Efficient Crash Resilience
International Conference on Extending Database Technology (**EDBT**), pages 689–694, 2015.

P9. Divy Agrawal, Amr El Abbadi, Vaibhav Arora, Ceren Budak, Theodore Georgiou, Hatem Mahmoud, <u>Faisal Nawab</u>, Cetin Shahin, Shiyuan Wang
Mind Your Ps and Vs: A Perspective on the Challenges of Big Data Management and Privacy Concerns
IEEE International Conference on Big Data and Smart Computing (**BigComp**), pages 1–6, 2015.

P8. Hatem Mahmoud, Vaibhav Arora, <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
MaaT: Effective and Scalable Coordination of Distributed Transactions in the Cloud
International Conference on Very Large Data Bases (**VLDB**), pages 7(5):329–340, 2014.

P7. <u>Faisal Nawab</u>, Kamran Jamshaid, Basem Shihada, and Pin-Han Ho
Fair Packet Scheduling in Wireless Mesh Networks
Elsevier Journal of **Ad Hoc Networks**, pages 13:414–427, 2014.

P6. <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
Message Futures: Fast Commitment of Transactions in Multi-Datacenter Environments
Biennial Conference on Innovative Data Systems Research (**CIDR**), pages 1–10, 2013.

P5. Hatem Mahmoud, <u>Faisal Nawab</u>, Alexander Pucher, Divyakant Agrawal, Amr El Abbadi
Low-latency Multi-datacenter Databases Using Replicated Commit
International Conference on Very Large Data Bases (**VLDB**), pages 6(9):661–672, 2013.

P4. Divyakant Agrawal, Amr El Abbadi, Hatem Mahmoud, <u>Faisal Nawab</u>, Ken Salem
Managing Geo-replicated Data in Multi-datacenters
Springer's Databases in Networked Information Systems (**DNIS**), pages 23–43, 2013.

P3. Stacy Patterson, Aaron Elmore, <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
Serializability, not Serial: Concurrency Control and Availability in Multi-Datacenter Datastores
International Conference on Very Large Data Bases (**VLDB**), pages 5(11):1459–1470, 2012.

P2. <u>Faisal Nawab</u>, Kamran Jamshaid, Basem Shihada, and Pin-Han Ho
MAC-Layer Protocol for TCP Fairness in Wireless Mesh Networks
IEEE International Conference on Communications in China (**ICCC**), pages 448–453, 2012.

P1. <u>Faisal Nawab</u>, Kamran Jamshaid, Basem Shihada, and Pin-Han Ho
TMAC: Timestamp-ordered MAC for CSMA/CA Wireless Mesh Networks
International Conference on Computer Communications and Networks (**ICCCN**), pages 1–6, 2011.

Other publications

O16. Lalithsai Posam, <u>Faisal Nawab</u>
PuPrChain: A Public-Private Cluster-Based Distributed Blockchain System Private, Secure, and Trustworthy
IoT Data Management Workshop (ASTRIDE 2023—co-located with ICDE 2023).
Part of the K-12 Competition.

O15. Kevin Bruhwiler, Fayzah Alshammari, Farzad Habibi, Juncheng Fang, <u>Faisal Nawab</u>
Analyzing Soft and Hard Partitions of Global-Scale Blockchain Systems
5th International Symposium on Foundations and Applications of Blockchain (**FAB**), 2022. (**Poster**)

O14. Juncheng Fang, Farzad Habibi, Kevin Bruhwiler, Fayzah Alshammari, <u>Faisal Nawab</u>
Improving Blockchain Resilience to Network Partitioning by Sharding
5th International Symposium on Foundations and Applications of Blockchain (**FAB**), 2022. (**Poster**)

O13. Saeed Kargar, <u>Faisal Nawab</u>
Hamming Tree: The Case for Memory-Aware Bit Flipping Reduction for NVM Indexing
11th Conference on Innovative Data Systems Research (**CIDR**), 2021.

O12. Saeed Kargar, <u>Faisal Nawab</u>
Extending the Lifetime of NVM: Challenges and Opportunities
International Conference on Very Large Data Bases (**VLDB**), 2021. (**Tutorial**)

O11. Natacha Mittal, <u>Faisal Nawab</u>
C-LSM: Cooperative Log Structured Merge Trees
ACM Symposium on Cloud Computing (**SOCC**), 2019. (**Poster**)

O10. Abhishek Singh, <u>Faisal Nawab</u>
WedgeDB: Transaction Processing for Edge Databases
ACM Symposium on Cloud Computing (**SOCC**), 2019. (**Poster**)

O9. Samaa Gazzaz, <u>Faisal Nawab</u>
Collaborative Edge-Cloud and Edge-Edge Video Analytics
ACM Symposium on Cloud Computing (**SOCC**), 2019. (**Poster**)

O8. <u>Faisal Nawab</u>, Mohammad Sadoghi, Abhishek Singh
Trusted Wide-Area and Edge Systems Using Hierarchical Permissioned Blockchain
First Workshop on Blockchain and Distributed Ledger (**BCDL**), 2019.
(**Workshop co-located with VLDB 2019**)

O7. Philipp Grulich, <u>Faisal Nawab</u>
Collaborative Edge and Cloud Neural Networks for Real-Time Video Processing
International Conference on Very Large Data Bases **(VLDB)**, 2018. **(Demo paper)**

O6. <u>Faisal Nawab</u>, Joseph Izraelevitz, Charles B. Morrey, Dhruva Chakrabarti, Michael L. Scott
Dali: A Periodically Persistent Hash Map
Non-Volatile Memories Workshop **(NVMW)**, 2018 **(Extended abstract)**

O5. <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
The Challenges of Global-scale Data Management
ACM International Conference on Management of Data **(SIGMOD)**, pages 2223–2227, 2016.
IEEE International Conference on Data Engineering **(ICDE)**, 2017 **(Tutorial)**

O4. Victor Zakhary, <u>Faisal Nawab</u>, Divyakant Agrawal, Amr El Abbadi
DB-Risk: The Game of Global Database Placement
ACM International Conference on Management of Data **(SIGMOD)**, pages 2185–2188, 2016.
(Demo paper)

O3. Colin Biafore, <u>Faisal Nawab</u>
Graph Summarization for Geo-correlated Trends Detection in Social Networks
ACM International Conference on Management of Data **(SIGMOD)**, pages 2247–2248, 2016.
(Undergraduate Research Competition)

O2. <u>Faisal Nawab</u>, Dhruva Chakrabarti, Terence Kelly, Brad Morrey
Zero-overhead NVM Crash Resilience
Non-Volatile Memories Workshop **(NVMW)**, 2015 **(Extended abstract)**

O1. <u>Faisal Nawab</u>, Dhruva Chakrabarti, Terence Kelly, Brad Morrey
Zero-overhead NVM Crash Resilience
USENIX Conference on File and Storage Technologies **(FAST)**, 2015 **(Extended abstract)**

Theses

T2. *Global-Scale Data Management With Strong Transactional Guarantees*
Ph.D. Dissertation, UC Santa Barbara (2018).

T1. *TMAC: Timestamp-Ordered MAC Protocol for Wireless Mesh Networks*
M.S. Thesis, KAUST (2011).

Talks/Presentations

- *The Tipping Point of Edge-Cloud Data Management.*
  Conference Presentation - Conference on Innovative Database Research (CIDR), 2024.

- *Enabling Emerging Edge and IoT Applications with Edge-Cloud Data Management.*
  Invited Talk - Purdue University, 2023.
  Invited Talk - Georgia Tech, 2023.
  Invited Talk - University of Southern California (USC), 2023.
  Invited Talk - University of Waterloo, 2023.
  Invited Talk - University of Chicago, 2023.
  Invited Talk - University of Washington (Northwest Database Society Colloquium), 2024.
  Invited Talk - King Fahd University of Petroleum and Minerals (KFUPM), 2023.

- *The Next Transformation in Computing: From the Cloud to the Global-Scale Edge.*
  Invited Talk - Orange County Chapter of the Association for Computing Machinery (ACM), 2023.

- *Enabling Smart City Applications with Edge-Cloud Decentralized Technologies.*
  Keynote - International Conference on Computing and Information Technology (ICCIT), 2023.

- *The Path Towards a Blockchain Substrate for IoT Applications.*
  Invited Talk - Private, Secure, and Trustworthy IoT Data Management Workshop (ASTRIDE), 2023.
  Invited Talk - University of California, Santa Cruz, 2023.
  Invited Talk - California State University, Fullerton, 2023.

- *Transforming the Edge to a Virtual Cloud, and Practice on automobile, enterprise and factory*
  Talk - Linux Akraino Spring Summit, 2023.

- *Fast and Accurate Data Analytics to Enable Closed-Loop High-throughput Organ- on-chip Platforms.*
  Talk at the CADMIM Industry Advisory Board Meeting, 2023.

- *BioDigitalTwin: Towards Reproducible and Standardized Biomedical Protocol Development with a Real-Time Data Analysis and Cloud Infrastructure.*
  Talk at the CADMIM Industry Advisory Board Meeting, 2023.

- *A Flexible Consensus Substrate for the Global-Scale Edge*
  Invited Talk in Meta's (Facebook's) Next-generation Data Infrastructures Summit, 2022.

- *Technologies to Support Global-Edge Computing and Managing Research Labs*
  Invited Talk in the 7th Saudi Scientific Symposium in Australia, 2022.

- *Workshop on the Concepts and Applications of the Internet of Things*
  Workshop hosted by KAUST University Innovation, 2021.

- *Extending the Lifetime of NVM: Challenges and Opportunities*, 1.5 hours tutorial.
  International Conference on Very Large Data Bases (VLDB), 2021.

- *WedgeChain: A Trusted Edge-Cloud Store With Asynchronous (Lazy) Trust.*
  IEEE International Conference on Data Engineering (ICDE), 2021.

- *Programming and Computer Science*
  K-12 outreach presentation, Turtlerock Elementary School, 2021.

- *The Journey from Graduate School to Leading a Research Lab*
  Invited Talk - King Abdulaziz City for Science and Technology (KACST), 2020.

- *The Next Transformation in Computing: From the Cloud to the Global-Scale Edge.*
  Invited Talk - ICS Dean's Leadership Council, 2021.
  Invited Talk - UC Berkeley, February 2020.
  Invited Talk - UC Irvine, April 2020.
  Invited Talk - King Abdullah University for Science and Technology, January 2020.
  Invited Talk - Thakaa Center of the Small and Medium Enterprises General Authority, Saudi Arabia, 2020

- *Building a Decentralized Infrastructure for the Future of IoT and Edge-Cloud Applications.*
  Invited Talk - Saudi Aramco, December 2019.

- *Data Management Closer to Users: Geo-Replication and Edge Awareness.*
  Invited Talk - LinkedIn, 2019.
  Invited Talk - CalPoly San Luis Obispo, October 2018.
  Invited Talk - VMware Research, August 2018.
  CS Seminar - King Abdullah University of Science and Technology, August 2017.
  Invited Talk - The University of California, Irvine, June, 2017.

- *The Challenges of Global-scale Data Management*, 3-hour tutorial.
  IEEE International Conference on Data Engineering (ICDE), 2017.

- *COP: Planning Conflicts for Faster Parallel Transactional Machine Learning.*
  International Conference on Extending Database Technology (EDBT), 2017.

- *The Challenges of Global-scale Data Management*, 3-hour tutorial.
  ACM International Conference on Management of Data (SIGMOD), 2016.

- *Minimizing commit latency in of transactions in geo-replicated data stores.*
  ACM International Conference on Management of Data (SIGMOD), 2015.

- *High Performance Temporal Indexing on Modern Hardware.*
  IEEE International Conference on Data Engineering (ICDE), 2015.

- *Chariots: A Scalable Shared Log for Data Management in Multi-datacenter Environments.*
  International Conference on Extending Database Technology (EDBT), 2015.

- *Procrastination Beats Prevention: Timely Sufficient Persistence for Efficient Crash Resilience.*
  International Conference on Extending Database Technology (EDBT), 2015.

- *Geo-Replication: A Journey From The Simple to The Optimal*
  Big Data UCLA seminar, 2015.

- *MaaT: Effective and Scalable Coordination of Distributed Transactions in the Cloud.*
  International Conference on Very Large Data Bases (VLDB), 2014.
- *Message Futures: Fast Commitment of Transactions in Multi-Datacenter Environments.*
  Biennial Conference on Innovative Data Systems Research (CIDR), 2013.
- *Low-latency Multi-datacenter Databases Using Replicated Commit.*
  International Conference on Very Large Data Bases (VLDB), 2013.
- *TMAC: Timestamp-ordered MAC for CSMA/CA Wireless Mesh Networks.*
  International Conference on Computer Communications and Networks (ICCCN), 2011.

Service

Organization
- Web Chair: International Conference on Data Engineering (ICDE) 2023
- Steering Committee: International Symposium of Foundations and Applications of Blockchain (FAB) 2021–2023
- General Chair: 3rd International Symposium on Foundations and Applications of Blockchain (FAB) 2020
- Local Co-Chair: The Fifth ACM/IEEE Symposium on Edge Computing (SEC) 2020
- Registration Co-Chair: 45th International Conference on Very Large Data Bases (VLDB) (2019)
- Scholarship Co-Chairs: ACM Symposium on Cloud Computing (SoCC) 2019
- Doctoral Symposium Co-Chair: ACM/IFIP International Middleware Conference (2019)

Journal Editor
- Associate Editor (Meta-Reviewer): SIGMOD Proceedings of the ACM on Management of Data (2025).
- Associate Editor: Springer Distributed and Parallel Databases (DAPD) Journal, 2020–2025.
- Guest Editor: Sensors (Special Issue: Industrial IoTs), 2020.

Conference Program Committee Member
- International Conference on Extending Database Technology (EDBT), 2025.
- International Conference on Very Large Data Bases (VLDB), 2023.
- ACM International Conference on Management of Data (SIGMOD), 2023.
- IEEE International Conference on Data Engineering (ICDE), 2023.
- International Conference on Very Large Data Bases (VLDB), 2022.
- ACM International Conference on Management of Data (SIGMOD), 2022.
- The Web Conference (formerly the International World Wide Web conference—WWW), 2021
- ACM India Joint International Conference on Data Science and Management of Data (CODS-COMAD), 2021.
- ACM/IFIP International Middleware Conference (MIDDLEWARE), 2021.
- International Conference on Very Large Data Bases (VLDB), 2020.
- ACM International Conference on Management of Data (SIGMOD), 2020.
- International Conference on Massive Storage Systems and Technology (MSST 2020).
- ACM Symposium on Cloud Computing (SoCC), 2019.
- International Conference on Very Large Data Bases (VLDB) PhD Symposium, 2019.
- ACM International Conference on Information and Knowledge Management (CIKM) (2018)
- IEEE CLUSTER (2018)
- ACM International Conference on Information and Knowledge Management (CIKM) (2017)
- International Conference on Informatics, Health, and Technology (2017)
- Workshop on Principles and Practice of Consistency for Distributed Data (2016)

Journal Reviewer
- The International Journal on Very Large Databases (VLDBJ) (2023)
- Springer's World Wide Web (2023)
- Springer's Distributed and Parallel Databases (2021)
- The SIGMOD Record (2020)
- The International Journal on Very Large Data Bases (The VLDB Journal) (2019)
- IEEE Transactions on Knowledge and Data Engineering (2019)
- IEEE Transactions on Knowledge and Data Engineering (2018)
- IEEE Transactions on Parallel and Distributed Systems (2018)
- IEEE Transactions on Cloud Computing (2018)
- IEEE Transactions on Dependable and Secure Computing (TDSC) (2018)
- IEEE Transactions on Knowledge and Data Engineering (2016)

IEEE Transactions on Computers (2016)
IEEE/ACM Transactions on Networking (2016)
Elsevier Journal of Ad Hoc Networks (2016)
Springer's Knowledge and Information Systems (2016)
Springer's Cluster Computing (2016)
Elsevier Information Processing Letters (2016)
Springer's Distributed and Parallel Databases (2015)
ACM Transactions on Database Systems (2015)

External Reviewer

International Conference on Extending Database Technology (EDBT), industrial track, 2017.
International Conference on Database Systems for Advanced Applications (DASFAA), 2017.
International Conference on Big Data and Smart Computing (BigComp), 2017.
ACM Symposium on Principles Of Database Systems (PODS), 2016.
Brazilian Symposium on Databases (SBBD), 2016.
IEEE International Conference on Data Engineering (ICDE), 2015.
IEEE Transactions on Computers (TC), 2015.
ACM International Conference on Management of Data (SIGMOD), 2015.
The International Conference on Networked Systems (NETYS), 2015.
ACM International Conference on Management of Data (SIGMOD), 2014.
International Conference on Extending Database Technology (EDBT), 2014.
The International Conference on Networked Systems (NETYS), 2014.
ACM/IFIP/USENIX Middleware conference (MIDDLEWARE), 2012.

Student Committee Member

Sharon Ladron De Guevara Contreras
  UC Irvine Ph.D. Advancement Committee Member (December 2023)
Sriram Rao
  UC Irvine Ph.D. Advancement Committee Member (December 2023)
Zane karl
  UC Irvine M.S. Committee Member (2023)
Xiaozhen Liu
  UC Irvine Ph.D. Advancement Committee Member (2023–)
Nada Lahjouji
  UC Irvine Ph.D. Advancement Committee Member (2023–)
Vishal Chakraborty
  UC Irvine Ph.D. Advancement Committee Member (2023–)
Khalid Abdulghani
  UC Irvine Ph.D. Dissertation Committee Member (2021–2023)
Peyman Tehrani
  UC Irvine Ph.D. Dissertation Committee Member (2021)
Glenn Justo Galvizo
  UC Irvine Ph.D. Dissertation Committee Member (2021–2023)
Sadeem Alsudais
  UC Irvine Ph.D. Dissertation Committee Member (2023)
Qi Lin
  UC Irvine M.S. Committee Chair (2023)
Shanshan Han
  UC Irvine Ph.D. Advancement Committee Member (2023)
Sinjoni Mukhopadhyay
  UC Santa Cruz Ph.D. Dissertation Committee Member (2023)
Binbin Gu
  UC Irvine Ph.D. Advancement Committee Chair (2022)
Primal Pappachan
  UC Irvine Ph.D. Dissertation Committee Member (2021)
Glenn Justo Galvizo
  UC Irvine Ph.D. Advancement Committee Member (2021)
Sadeem Alsudais
  UC Irvine Ph.D. Advancement Committee Member (2021)
Peyman Tehrani

UC Irvine Ph.D. Advancement Committee Member (2021)

Niharika Srivastav
UCSC CSE M.S. Project Committee Chair (2020)

Meghna Burli
UCSC CSE M.S. Project Committee Chair (2020)

Sonali Suri
UCSC CSE M.S. Project Committee Chair (2020)

Bobby Dhillon
UCSC CSE M.S. Project Committee Chair (2020)

Abdurrahman Al-Omari
UCSC CSE M.S. Project Committee Chair (2020)

Jingshi Liu
UCSC CSE M.S. Project Committee Chair (Spring 2020)

Howard Guo
UCSC CSE M.S. Project Committee Chair (Spring 2020)

Saeed Kargar
UCSC CSE M.S. Project Committee Chair (Spring 2020)

Natasha Mittal
UCSC CSE M.S. Project Committee Chair (Spring 2020)

Aasim Khan
UCSC CSE M.S. Project Committee Chair (Winter 2020)

Yiwen Wang
UCSC CSE M.S. Project Committee Chair (Winter 2020)

Jie Yin
UCSC CSE M.S. Project Committee Chair (Winter 2020)

Jincheng Li
UCSC CSE M.S. Project Committee Chair (Fall 2019)

Kaixin Liu
UCSC CSE M.S. Project Committee Chair (Fall 2019)

Adil Rahman
UCSC CSE M.S. Project Committee Chair (Fall 2019)

Pengyang Zhou
UCSC CSE M.S. Project Committee Chair (Fall 2019)

Shuli Hi
UCSC CSE M.S. Project Reading Committee Member (Spring 2019)

Changsheng Liu
UCSC CSE M.S. Project Committee Chair (Spring 2019)

De Huo
UCSC CSE M.S. Project Reading Committee Member (Spring 2019)

Roy Shadmon
UCSC Computer Science M.S. Project Reading Committee Member (2019)

Christine Quintana
UCSC Computer Science M.S. Project Reading Committee Member (2018)

Kavya Jha
UCSC Computer Science M.S. Project Reading Committee Chair (2018)

Muhammad Saber
UCSC Computer Science M.S. Project Reading Committee Member (2018)

Yuan-Ping Chen
UCSC Computational Media M.S. Project Reading Committee Member (2018)

University Service at UC Irvine
Computer Science Department Graduate Admission Committee (2021–2023)
Graduate Open House (2021 and 2022)

University Service at UC Santa Cruz
Graduate Fellowship Review Committee (2020)
Computer Science and Engineering Department Faculty Search Committee (2019)
Computer Science Department Graduate Admission Committee (2018)
BSOE Graduate Open House (2018)

Honors and awards

- Academic Senate Council on Research, Computing and Libraries (CORCL) Award, 2023.
- IEEE TEMS Blockchain Early-Career Award (Runner-up), awarded at **IEEE Blockchain**, 2022.
- Academic Senate Council on Research, Computing and Libraries (CORCL) Award, 2022.
- Distinguished Review Board Member Award, Proceedings of the Very Large Databases (PVLDB), 2022.
- "Next-Generation Data Infrastructure" award, Facebook, 2021.
- Distinguished Review Board Member Award, Proceedings of the Very Large Databases (PVLDB), 2020.
- Outstanding Dissertation Award from UC Santa Barbara's Computer Science Department, 2018.
- The paper entitled: "High Performance Temporal Indexing on Modern Hardware" was selected as one of the best papers in IEEE International Conference on Data Engineering (ICDE), 2015.
- Outstanding publication award from UC Santa Barbara's Computer Science department, 2015.
- Travel grants from SIGMOD, ICDE, and the UC Santa Barbara senate, 2015.
- Best presentation award at UC Santa Barbara's graduate student workshop, 2014.
- Outstanding TA award by UC Santa Barbara's Computer Science department, 2013.
- Scholarship from the Saudi Arabian Cultural Mission, 2012-now.
- Academic excellence award from KAUST, 2010.
- Graduate fellowship from KAUST, 2009-2011.
- Discovery scholarship from KAUST, 2008-2009.