

Research Interests

My research lies at the intersection of **Big Data management** and **distributed Cloud Computing systems**. Specifically, I work on data management systems that accelerate and support **data science** and **global connectivity** especially in the context of autonomous, mobile applications and the Internet of Things.

Employment

2018–	Assistant Professor of Computer Science The University of California, Santa Cruz
2017	Acting Assistant Professor of Computer Science 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

2012-2017	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

Student Mentoring

- *Natasha Mittal*, Ph.D. at UC Santa Cruz (2018-now)
- *Holly Casaletto*, Ph.D. at UC Santa Cruz (2018-now)
- *Iman Ahmadpour Yasouri*, Ph.D. at UC Santa Cruz (2018-now)
- *Abhishek Singh*, Ph.D. at UC Santa Cruz (2018-now)
- *Kavya Jha*, M.S. at UC Santa Cruz (Spring 2018)
Project: Global-Scale Permissioned Blockchain
- *Ahmed Almutawa*, B.S./M.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
- *Philipp Grulich*, (Exchange) M.S. at UC Santa Cruz (2017-2018)
Project: An Analytics Pipeline for Edge Computing

- *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.
- *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
- *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

Teaching

- Courses taught:
 - CMPS290S: Advanced Topics in Computer Systems (Winter '18 in UCSC)
 - CMPS111: Introduction to Operating Systems (Fall '18 in 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

- G1. *CNS: Small: Data on the Edge: Leveraging Edge Datacenters for Low-latency, Fault-tolerant, mobile, Geo-replicated Transactional Data Stores*
National Science Foundation, Award number: 1815212, \$249,500 (2018–2021)

Patents

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

Conference and journal publications

- P29. Faisal Nawab, 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.

- P28. Philipp Grulich, [Faisal Nawab](#)
Collaborative Edge and Cloud Neural Networks for Real-Time Video Processing
International Conference on Very Large Data Bases (**VLDB**), 2018. (**Demo paper**)
- P27. [Faisal Nawab](#), Joseph Izraelevitz, Charles B. Morrey, Dhruva Chakrabarti, Michael L. Scott
Dali: A Periodically Persistent Hash Map
Non-Volatile Memories Workshop (**NVMW**), 2018 (**Extended abstract**)
- P26. [Faisal Nawab](#), 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.
- P25. Victor Zakhary, [Faisal Nawab](#), Divyakant Agrawal, Amr El Abbadi
Global-Scale Placement of Transactional Data Stores
International Conference on Extending Database Technology (**EDBT**), 2018.
- P24. [Faisal Nawab](#), 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.
- P23. Vaibhav Arora, [Faisal Nawab](#), Divyakant Agrawal, Amr El Abbadi
Janus: A Hybrid Scalable Multi-Representation Cloud Datastore
IEEE Transactions on Knowledge and Data Engineering (**TKDE**), 2017.
- P22. [Faisal Nawab](#), 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.
- P21. Vaibhav Arora, [Faisal Nawab](#), Divyakant Agrawal, Amr El Abbadi
Typhon: Consistency Semantics for Multi-Representation Data Processing
IEEE International Conference on Cloud Computing (**CLOUD**), 2017.
- P20. Vaibhav Arora, [Faisal Nawab](#), Divyakant Agrawal, Amr El Abbadi
Multi-Representation Based Data Processing Architecture for IoT Applications
IEEE International Conference on Distributed Computing (**ICDCS**), 2017.
- P19. [Faisal Nawab](#), Divyakant Agrawal, Amr El Abbadi, Sanjay Chawla
COP: Planning Conflicts for Faster Parallel Transactional Machine Learning
International Conference on Extending Database Technology (**EDBT**), 2017.
- P18. [Faisal Nawab](#), 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**)
- P17. Victor Zakhary, [Faisal Nawab](#), 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**)
- P16. Colin Biafore, [Faisal Nawab](#)
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**)
- P15. [Faisal Nawab](#), 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.
- P14. David Lomet, [Faisal Nawab](#)
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.
- P13. [Faisal Nawab](#), 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.

- P12. [Faisal Nawab](#), 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.
- P11. Divy Agrawal, Amr El Abbadi, Vaibhav Arora, Ceren Budak, Theodore Georgiou, Hatem Mahmoud, [Faisal Nawab](#), 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.
- P10. [Faisal Nawab](#), Dhruva Chakrabarti, Terence Kelly, Brad Morrey
Zero-overhead NVM Crash Resilience
Non-Volatile Memories Workshop (**NVMW**), 2015 (**Extended abstract**)
- P9. [Faisal Nawab](#), Dhruva Chakrabarti, Terence Kelly, Brad Morrey
Zero-overhead NVM Crash Resilience
USENIX Conference on File and Storage Technologies (**FAST**), 2015 (**Extended abstract**)
- P8. Hatem Mahmoud, Vaibhav Arora, [Faisal Nawab](#), 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. [Faisal Nawab](#), 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. [Faisal Nawab](#), 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, [Faisal Nawab](#), 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, [Faisal Nawab](#), 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, [Faisal Nawab](#), 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. [Faisal Nawab](#), 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. [Faisal Nawab](#), 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.

Theses

- T2. *Global-Scale Data Management With Strong Transactional Guarantees*
Ph.D. Dissertation, UC Santa Barbara (2017).
- T1. *TMAC: Timestamp-Ordered MAC Protocol for Wireless Mesh Networks*
M.S. Thesis, KAUST (2011).

Presentations

- *Data Management Closer to Users: Geo-Replication and Edge Awareness.*
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

Journal Reviewer

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)

Conference Program Committee Member

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)

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

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)

Kamala Ramasubramanian

UCSC Computer Science Ph.D. Advancement Committee Member

University Service in UC Santa Cruz

Computer Science Department Graduate Admission Committee (2018)

BSOE Graduate Open House (2018)

Honors and awards

- 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.