Hasan Kurban, Ph.D.

Curriculum Vitae

College of Science and Engineering, Hamad Bin Khalifa University
Office 246S, Education City, PO Box 23874, Doha, Qatar
✉ hkurban@hbku.edu.qa ✉ hakurban@iu.edu
Indiana University Bloomington www.hasankurban.com

Research Interests & Education

Research Interests: AI, Software Engineering, AI for Science, Data Science, Big Data

Ph.D. in Computer Science, **Minor in** Statistics
Indiana University, Bloomington, IN, USA **Completed: September 2017**
Advisor: Prof. Mehmet M. Dalkilic
Committee Members: Prof. Predrag Radivojac, Prof. Michael W. Trosset, Prof. Yuzhen Ye
Dissertation Title: *A Novel Approach to Optimization of Iterative Machine Learning Algorithms: Over Heap Structure*

Publications

Peer-Reviewed Journal Articles

41. Samir Abdaljalil, **Hasan Kurban**, Parichit Sharma, Rachad Atat, Erchin Serpedin. "SINdex: Semantic INconsistency Index for Hallucination Detection in LLMs," *Journal of Artificial Intelligence Research* , 2025. Under Review

40. Hasan Cetinkaya, Fahrettin Ay, Mehmet Tuncel, Hazem Nounou, Mohamed Numan Nounou, **Hasan Kurban**, Erchin Serpedin. "Curriculum-Enhanced Adaptive Sampling for Physics-Informed Neural Networks: A Robust Framework for Stiff PDEs," *Journal of Scientific Computing*, 2025. Under Review

39. **Hasan Kurban**, Parichit Sharma, Mehmet Dalkilic, Mustafa Kurban. "Accelerating Density of States Prediction in Zn-Doped MgO Nanoparticles via Kernel-Optimized Weighted k-NN," *Scientific Reports*, 2025. Under Review

38. Md Rabiul Islam, Md Kamrul Hasan, **Hasan Kurban**, Erchin Serpedin. "Bayesian Probabilistic Knowledge from Diameter Prior for Decision Fusion to Detect Lung Nodule Heterogeneity," *IEEE Transactions on Artificial Intelligence*, 2025. Under Review

37. Md. Mainul Islam, Abdulrahman Takiddin, Muhammad Ismail, **Hasan Kurban**, Erchin Serpedin. "Linear-Complexity Unified Defense Against Deception Attacks in Distributed Economic Dispatch," *IEEE Transactions on Smart Grid*, 2025. Under Review

36. Mert Onur Cakiroglu, Idil Bilge Altun, Shahriar Rahman Fahim, **Hasan Kurban**, Mehmet M. Dalkilic, Rachad Atat, Abdulrahman Takiddin, Erchin Serpedin. "An Extended Frequency-Improved Legendre Memory Model for Enhanced Long-term Electricity Load Forecasting," *IEEE Open Access Journal of Power and Energy*, 2025. Under Review

35. Madhavan Kalkunte Ramachandra, **Hasan Kurban**, M. Oguzhan Kulekci and Mehmet M. Dalkilic. "tiknn: Telescope Indexing for k-Nearest Neighbor Search Algorithms over High Dimensional Data & Large Data Sets," *Scientific Reports*, 2025. Under Review

34. Samir Abdaljalil, **Hasan Kurban**, Rachad Atat, Erchin Serpedin, Khalid Qaraqe. "Deep Temporal and Structural Embeddings for Robust Unsupervised Anomaly Detection in Dynamic Graphs," *IEEE Open Journal of the Computer Society*, 2025. Under Review

33. Marcin S. Malec, Parichit Sharma, **Hasan Kurban**, and Mehmet Dalkilic. "`ccImpute`: An R Package for Fast & Accurate Imputation of Dropouts in Single-Cell RNA-Seq Data," *SoftwareX*, 2025. Under Review

32. Parichit Sharma, **Hasan Kurban**, Marcin Malec, Oguzhan Kulekci, Mehmet Dalkilic. "Geometric-k-means: An Unbounded, Accurate and Energy-Efficient k-means," *Machine Learning*, 2025. Under Review

31. Can Polat, **Hasan Kurban**, Mustafa Kurban. "Enabling Ease of Access to Quantum Chemistry with Transformer-Based Text Encoding and Physics-Informed Multilayer Perceptron," *Physica Scripta*, 2025. Under Review

30. Ganesh Arkanath, **Hasan Kurban**, Mehmet M. Dalkilic. "PlayoffsNet: Enhancing NBA Playoffs Prediction Through Engineered Features and Explainable Deep Learning," *Journal of Big Data*, 2025. Under Review

29. Mert Onur Cakiroglu, **Hasan Kurban**, Elham Khorasani Buxton, and Mehmet Dalkilic. "A Novel Discrete Time Series Representation with De Bruijn Graphs for Enhanced Forecasting using TimesNet," *IEEE Access*, 2025. Under Review

28. Can Polat, **Hasan Kurban**, Erchin Serpedin, Mustafa Kurban. "TDCM25: A Multi-Modal Multi-Task Benchmark for Temperature-Dependent Crystalline Materials," *Machine Learning: Science and Technology*, 2025.

27. Can Polat, **Hasan Kurban**, Mustafa Kurban. "QuantumShellNet: Ground-State Eigenvalue Prediction of Materials Using Electronic Shell Structures and Fermionic Properties via Convolutions," *Computational Materials Science*, 246, 113366, 2025.

26. Parichit Sharma, Sarthak Mishra, **Hasan Kurban**, Mehmet M. Dalkilic. "p-ClustVal: A Novel p-adic Approach for Enhanced Clustering and Valuation in High-Dimensional scRNASeq Data ," *International Journal of Data Science and Analytics*, 2025.

25. Fahrettin Ay, Saud Althunibat, Khalid Qaraqe, **Hasan Kurban**. "A Noise-Adaptive Machine Learning Framework for Optimizing User Grouping in Dynamic IM-OFDMA Systems," *IEEE Transactions on Communications*, 2024.

24. Mert Onur Cakiroglu, **Hasan Kurban**, Khalid Qaraqe, Lilia Aljihmani, Goran Petrovski, Mehmet M. Dalkilic. "A Reinforcement Learning Approach to Effective Forecasting of Pediatric Hypoglycemia in Diabetes I Patients: an extended de Bruijn Graph," *Scientific Reports*, 2024.

23. Can Polat, Mustafa Kurban, **Hasan Kurban**. "Multimodal Neural Network-Based Predictive Modeling of Nanoparticle Properties from Pure Compounds," *Machine Learning: Science and Technology*, 2024.

22. Mustafa Kurban, Can Polat, Erchin Serpedin, **Hasan Kurban**. "Enhancing the electronic properties of TiO_2 nanoparticles through carbon doping: An integrated DFTB and computer vision approach," *Computational Materials Science*, 244, 113248, 2024.

21. Mert Onur Cakiroglu, **Hasan Kurban**, Parichit Sharma, M. Oguzhan Kulekci, Elham Khorasani Buxton, Maryam Raeeszadeh-Sarmazdeh and Mehmet Dalkilic. "An Extended de Bruijn Graph for Feature Engineering Over Biological Sequential Data," *Machine Learning: Science and Technology*, 5(3), 035020, 2024.

20. Selcuk Temiz, Salim Erol, **Hasan Kurban**, and Mehmet M. Dalkilic. "State of Charge and Temperature-Dependent Impedance Spectra Regeneration of Lithium-Ion Battery by Duplex Learning Modeling," *Journal of Energy Storage*, 64, 107085, 2023.

19. **Hasan Kurban**, Mustafa Kurban, and Mehmet M. Dalkilic. "Rapidly Predicting Kohn-Sham Total Energy Using Data-centric AI," *Nature Scientific Reports*, vol.12, pp.1-14, 2022.

18. Selcuk Temiz, **Hasan Kurban**, Salim Erol, and Mehmet M. Dalkilic. "Data on Machine Learning Regenerated Lithium-ion Battery Impedance," *Data in Brief*, 108698, 2022.

17. Marcin S. Malec, **Hasan Kurban**, and Mehmet M. Dalkilic. "ccImpute: an Accurate and Scalable Consensus Clustering Based Algorithm to Impute Dropout Events in Single-Cell RNA-seq Data," *BMC Methods*, vol.23, pp. 1-17, 2022.

16. Selcuk Temiz, **Hasan Kurban**, Salim Erol, and Mehmet M. Dalkilic. "Regeneration of Lithium-ion Battery Impedance Using a Novel Machine Learning Framework and Minimal Empirical Data," *Journal of Energy Storage*, 52, 105022(1-34), 2022.

15. Parichit Sharma, **Hasan Kurban**, and Mehmet M. Dalkilic. "DCEM: An R package for Clustering Big Data via Data-centric Modification of Expectation Maximization," *SoftwareX*, 17, 100944, 2022.

14. **Hasan Kurban** and Mustafa Kurban. "Building Machine Learning Systems for Multi-Atoms Structures: CH3NH3PbI3 Perovskite Nanoparticles," *Computational Materials Science*, 195, 110490(1-9), 2021.

13. **Hasan Kurban**, Mustafa Kurban, Parichit Sharma, and Mehmet M. Dalkilic. "Predicting Atom Types of Anatase TiO2 Nanoparticles with Machine Learning," *Key Engineering Materials*, vol.880, pp.89-94, 2021.

12. **Hasan Kurban** and Mustafa Kurban. "Rare-class Learning over Mg-Doped ZnO Nanoparticles," *Chemical Physics*, vol.546, 11159(1-9), 2021.

11. Iskender Muz, **Hasan Kurban**, and Mustafa Kurban. "A DFT Study on Stability and Electronic Structure of AlN Nanotubes," *Materials Today Communications*, 26, 102118(1-7), 2021.

10. **Hasan Kurban**, Sholeh Alaei, and Mustafa Kurban. "Effect of Mg content on Electronic Structure, Optical and Structural Properties of Amorphous ZnO Nanoparticles: A DFTB Study," *Journal of Non-Crystalline Solids*, 560, 120726(1-6), 2021.

9. **Hasan Kurban**. "Atom Classification with Machine Learning and Correlations among Physical Properties of ZnO Nanoparticle," *Chemical Physics*, vol.545, 111143(1-9), 2021.

8. **Hasan Kurban**. "Measuring the Proximity of Medical Treatment Areas with Text Mining," *European Journal of Science and Technology*, no.21, pp. 518-526, 2021.

7. **Hasan Kurban**. "Practical Data Science: Examining the Correlations between Structural and Electronic Properties of Different Phases of TiO2 Nanoparticles," *Journal of Selcuk-Technic*, 4(19), 1-9, 2020.

6. **Hasan Kurban**, Mehmet Dalkilic, Selcuk Temiz, and Mustafa Kurban. "Tailoring the Structural Properties and Electronic Structure of Anatase, Brookite and Rutile Phase TiO2 Nanoparticles: DFTB Calculations," *Computational Materials Science*, 183, 109843(1-9), 2020.

5. **Hasan Kurban** and Mustafa Kurban. "Study of Structural and Optoelectronic Properties of Hexagonal ZnO Nanoparticles," *Bilecik Seyh Edebali University Journal of Science*, 6(2), 124-131, 2019.

4. Mustafa Kurban, **Hasan Kurban**, and Mehmet M. Dalkilic. "Controlling Structural and Electronic Properties of ZnO NPs," *Bilge International Journal of Science and Technology Research*, 3(0), 35-39, 2019.

3. **Hasan Kurban**, Mustafa Kurban, and Mehmet M. Dalkilic. "Density-functional Tight-binding Approach for the Structural Analysis and Electronic Structure of Copper Hydride Metallic Nanoparticles," *Materials Today Communications*, 21, 100648(1-7), 2019.

2. **Hasan Kurban**, Mark Jenne, and Mehmet M. Dalkilic. "Using Data to Build a Better EM: EM* for Big Data," *International Journal of Data Science and Analytics*, vol.4, no.2, pp. 83-97, 2017.

1. Mark Jenne, Owen Boberg, **Hasan Kurban**, and Mehmet M. Dalkilic. "Studying the Milky Way Galaxy using ParaHeap-k, a parallel heap-based k-means," *IEEE Computer*, vol.47, no.9, pp.26-33, 2014.

Peer-Reviewed Conference Proceedings

33. **PhysicsNeRF: Physics-Guided 3D Reconstruction from Sparse Views**
Mohamed Rayan Barhdadi, **Hasan Kurban**, and Hussein Alnuweiri
The 42nd International Conference on Machine Learning (ICML), Building Physically Plausible World Models, Vancouver, Canada, 2025.
Under Review

32. **Multivariate de Bruijn Graphs: A Symbolic Graph Framework for Time Series Forecasting**
Mert Onur Cakiroglu, Idil Bilge Altun, **Hasan Kurban**, Elham Khorasani Buxton, and Mehmet Dalkilic
The 42nd International Conference on Machine Learning (ICML), Foundation Models for Structured Data (FMSD), Vancouver, Canada, 2025.
Under Review

31. ***HalluVerse3*: A Fine-Grained Multilingual Benchmark for Hallucination Detection in LLMs**
Samir Abdaljalil, **Hasan Kurban**, Erchin Serpedin
The 39th Annual Conference on Neural Information Processing Systems (NeurIPS), San Diego CA, USA, 2025.
Under Review

30. **R-CRYSTALS: A Symmetry-Aware Benchmark for Radius-Resolved Nanoparticle Generation and Lattice Reconstruction**
Can Polat, **Hasan Kurban**, Erchin Serpedin, Mustafa Kurban
The 39th Annual Conference on Neural Information Processing Systems (NeurIPS), San Diego CA, USA, 2025.
Under Review

29. **SAFE: A Sparse Autoencoder-Based Framework for Robust Query Enrichment and Hallucination Mitigation in LLMs**
Samir Abdaljalil, Filippo Pallucchini, Andrea Seveso **Hasan Kurban**, Fabio Marcorio, Erchin Serpedin
30th Empirical Methods in Natural Language Processing (EMNLP), Suzhou, China, 2025.
Under Review

28. **xChemAgents: Agentic AI for Explainable Quantum Chemistry**
Can Polat, Mehmet Tuncel, **Hasan Kurban**, Erchin Serpedin, Mustafa Kurban
The 42nd International Conference on Machine Learning (ICML), Multi-Agent Systems in the Era of Foundation Models: Opportunities, Challenges and Futures, Vancouver, Canada, 2025.
Under Review

27. **Beyond Coordinates: Integrating Geometry, Projections, and Semantics in a Crystal-Structure Benchmark**
Can Polat, **Hasan Kurban**, Erchin Serpedin, Mustafa Kurban
The 42nd International Conference on Machine Learning (ICML), DataWorld: Unifying Data Curation Frameworks Across Domains, Vancouver, Canada, 2025.
Under Review

26. **Understanding the Capabilities of Molecular Graph Neural Networks in Materials Science Through Multimodal Learning and Physical Context Encoding**
Can Polat, **Hasan Kurban**, Erchin Serpedin, Mustafa Kurban
The 42nd IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR), Multimodal Learning for Materials Science (MM4Mat), Nashville TN, USA, 2025.

25. **TDCM25: A Multi-Modal Multi-Task Benchmark for Temperature-Dependent Crystalline Materials**
Can Polat, **Hasan Kurban**, Erchin Serpedin, Mustafa Kurban
The Thirteenth International Conference on Learning Representations (ICLR), AI for Accelerated Materials Design, Singapore, 2025.

24. **De Bruijn Graph-Enhanced Time Series Models for Electricity Load Forecasting**
Mert Onur Cakiroglu, Idil Bilge Altun, Shahriar Rahman Fahim, **Hasan Kurban**, Mehmet M. Dalkilic, Rachad Atat, Abdulrahman Takiddin, Erchin Serpedin, Khalid Qaraqe

17th International Symposium on Signals, Circuits and Systems (SSCS), Iași, Romania, 2025.
Under Review

23. **Rule-Based Ensemble Learning for Wi-Fi Indoor Localization: A Fine-Tuned Approach with Comprehensive Machine Learning Benchmarking**
Parichit Sharma, Fadwa Abbas, Nour Alabudi, Roudha Al-Khaldi, Sandra Mansour, Mehmet Tuncel, **Hasan Kurban**, Ali Ghrayeb
IEEE 36th International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC), Istanbul, Turkiye, 2025.
Under Review

22. **Data-Efficient Hydrogen Adsorption Prediction in Copper Nanoclusters: A Computer Vision-Based Transfer Learning Approach**
Can Polat, **Hasan Kurban**, Erchin Serpedin, Mustafa Kurban
The 19th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG), AI-Driven Innovations in Renewable Energy: Challenges and Future Directions, Antalya, Turkey, 2025.

21. **Instance-Based Learning-Driven Density of States Analysis in Functionalized Fullerene Derivatives for Optimizing Organic Photovoltaics**
Parichit Sharma, **Hasan Kurban**, Mehmet Dalkilic, Mustafa Kurban
The 19th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG), AI-Driven Innovations in Renewable Energy: Challenges and Future Directions, Antalya, Turkey, 2025.

20. **Decentralized N-1 Contingency Analysis for Cascading Failure Prediction in Multi-Region Power Systems using Consortium Blockchain**
Md. Mainul Islam, Muhammad Ismail, Rachad Atat, **Hasan Kurban**, Katherine R. Davis, Erchin Serpedin
The 5th International Conference on Electrical, Computer and Energy Technologies (ICECET), Paris, France, 2025.

19. **Exploring Various Sequential Learning Methods for Deformation History Modeling**
Muhammed Adil Yatkin, Mihkel Korgesaar, Jani Romanoff, Joshua Stuckner, Ümit Işlak, **Hasan Kurban**
26th Engineering Applications of Neural Networks / Engineering Applications and Advances of Artificial Intelligence (EAAAI), Limassol, Cyprus, 2025.

18. **Predicting Optical Bandgaps in C_{60} and Functionalized Derivatives from Limited Data for Renewable Energy Applications**
Mehmet Tuncel, **Hasan Kurban**, Erchin Serpedin, Mustafa Kurban
The 19th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG), AI-Driven Innovations in Renewable Energy: Challenges and Future Directions, Antalya, Turkey, 2025.

17. **A Novel Discrete Time Series Representation with De Bruijn Graphs for Enhanced Forecasting using TimesNet (Extended Abstract)**
Mert Onur Cakiroglu, **Hasan Kurban**, Elham Khorasani Buxton, and Mehmet Dalkilic
The 11th IEEE International Conference on Data Science and Advanced Analytics (DSAA 2024) , San Diego, USA, 2024.

16. **p-ClustVal: A Novel p-adic Approach for Enhanced Clustering and Valuation in High-Dimensional scRNASeq Data (Extended Abstract)**
Parichit Sharma, Sarthak Mishra, **Hasan Kurban**, Mehmet M. Dalkilic
The 11th IEEE International Conference on Data Science and Advanced Analytics (DSAA 2024) , San Diego, USA, 2024.

15. **What Data-Centric AI Can Do For k-means: a Faster, Robust k-means-d**
Parichit Sharma, **Hasan Kurban** and Mehmet M. Dalkilic
The 41st International Conference on Machine Learning (ICML), Data-centric Machine Learning Research (DMLR): Datasets for Foundation Models, Vienna, Austria, 2024.

14. **Novel NBA Fantasy League driven by Engineered Team Chemistry and Scaled Position Statistics**
Ganesh Arkanath, Nishad Gupta, **Hasan Kurban**, Parichit Sharma, Madhavan K R, Elham Khorasani Buxton and Mehmet M. Dalkilic
IEEE International Conference on Big Data: Data-Centric AI, Sorrento, Italy, 2023

13. **Are Sports Awards About Sports? Using AI to Find the Answer**
Anshumaan Shankar, Gowtham Veerabadran Rajasekaran, Jacob Hendricks, Jared Andrew Schlak, Parichit Sharma, Madhavan K R, **Hasan Kurban** and Mehmet M. Dalkilic
European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML/PKDD): 10th Workshop on Machine Learning and Data Mining for Sports Analytics, Turin, Italy, 2023

12. **AReS: An AutoML Regression Service for Data Analytics and Novel Data-centric Visualizations**
Josh Elms, Sam Johnson, Madhavan K R, Keerthana Sugasi, Parichit Sharma, **Hasan Kurban** and Mehmet M. Dalkilic
29th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Undergraduate Consortium (KDD-UC), Long Beach, CA, USA, 2023

11. **Are They What They Claim: A Comprehensive Study of Ordinary Linear Regression Among the Top Machine Learning Libraries in Python**
Sam Johnson, Josh Elms, Madhavan K R, Keerthana Sugasi, Parichit Sharma, **Hasan Kurban** and Mehmet M. Dalkilic
29th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Undergraduate Consortium, (KDD-UC), Long Beach, CA, USA, 2023

10. **Data Expressiveness and Its Use in Data-centric AI**
Hasan Kurban, Parichit Sharma and Mehmet M. Dalkilic
Neurips Data-centric AI, 2021

9. **Size Dependent Electronic Structure and Structural Properties of Cupric Oxide (CuO) Nanoparticles**
Hasan Kurban, Mustafa Kurban and Mehmet M. Dalkilic
NEM, 2019

8. **Using Data Analytics to Optimize Public Transportation on a College Campus**
Kurt Zimmer, **Hasan Kurban**, Mark Jenne, Logan Keating, Perry Maull, Mehmet M. Dalkilic
DSAA, Turin, Italy, 2018

7. **A novel approach to optimization of iterative machine learning algorithms: over heap structure**
Hasan Kurban, Mehmet M. Dalkilic
IEEE BigData, Boston, MA, USA, 2017

6. **Improving Expectation Maximization Algorithm over Stellar Data**
Hasan Kurban, Can Kockan, Mark Jenne and Mehmet M. Dalkilic
IEEE BigData: Workshop on Management, Search and Mining of Massive Repositories of Solar and Stellar Astronomy Data, Boston, MA, USA, 2017

5. **Case study: clustering big stellar data with EM***
Hasan Kurban, Can Kockan, Mark Jenne and Mehmet M. Dalkilic
IEEE/ACM International Conference on Big Data Computing, Applications and Technologies (BDCAT), Austin, Texas, USA, 2017
Received Best Poster Award

4. **Employing Software Engineering Principles to Enhance Management of Climatological Datasets for Coral Reef Analysis**
Mark Jenne, Alex Zimmerman, **Hasan Kurban**, Claudia Johnson and Mehmet M. Dalkilic
The 6th International Workshop on Climate Informatics (CI), Colorado, USA, 2016

3. **EM*: An EM algorithm for Big Data**
Hasan Kurban, Mark Jenne and Mehmet M. Dalkilic

IEEE International Conference on Data Science and Advanced Analytics, Montreal, Canada, 2016
Received Honorable Mention Paper Award

2. **Red-RF: Reduced Random Forest for big data using priority voting & dynamic data reduction**
Hussein Mohsen, **Hasan Kurban**, Kurt Zimmer, Mark Jenne, Mehmet M. Dalkilic
IEEE BigData Congress, New York, USA, 2015

1. **A new set of Random Forests with varying dynamic data reduction and voting techniques**
Hussein Mohsen, **Hasan Kurban**, Mark Jenne, Mehmet M. Dalkilic
IEEE International Conference on Data Science and Advanced Analytics, Shanghai, China, 2014

Book Reviews

3. *Data Science For All* by Brennan Davis and Hunter Glanz, 2024
ISBN: 9780135311189

2. *Mastering Social Media Mining with R* by Sharan Kumar Ravindran, 2015
ISBN: 1784396311

1. *Learning Data Mining with R* by Bater Makhabel, 2015
ISBN: 1783982101

Honors and Awards

- **QRDI Undergraduate Research Experience Program (UREP) Award (2025):**
Project: "Leveraging Data Analytics for Interpreting Transformer Dissolved Gas Analysis"
Lead PI: Dr. Selma K. Awadallah, PI: Dr. Hasan Kurban, (UREP31-043-2-014) — Award Amount: $26,042

- **$10,000 Transformative Educational Experience (TEE) grant:**
Awarded by the Center for Teaching and Learning (CTL) at Texas A&M University at Qatar, 2024. Transforming Software Engineering Education through Autograder and LLM Integration.

- **$10,000 Multiversity Academic Grant:**
Awarded by Texas A&M University at Qatar, 2024. For a novel, multi-institutional Machine Learning for Engineers course.

- **$53,750 Faculty Resource Allocation:**
Awarded by Texas A&M University at Qatar, 2023. Funds faculty teaching and research for three years.

- **$177,000 Research Impact Initiative:**
Awarded by Texas A&M University at Qatar, 2023. Funds three-year projects leveraging AI, machine learning, and data analytics to enhance Qatar's sustainable energy, healthcare, and security.

- **$413,000 in Startup Research Funds:**
Awarded by Texas A&M University at Qatar, 2023. Support for initiating cutting-edge research projects for three years.

- **Best Poster Award:**
IEEE/ACM International Conference on Big Data Computing, Applications and Technologies, Austin, TX, 2017.

- **Best Paper Award:**
IEEE International Conference on Data Science and Advanced Analytics, Montreal, Canada, 2016.

- **Turkish National Ministry of Education Scholarship:**
Comprehensive funding for graduate studies at prestigious international institutions, 2009–2017.

- **Nomination for Researcher of the Year:**
Indiana University, Bloomington; Academic Years 2016–2017.

- **Nomination for Associate Instructor of the Year:**
  Indiana University, Bloomington; Academic Years 2014–2015.
- **Computer Science Graduate Fellowship:**
  Indiana University, Bloomington; August 2010–May 2012.

Service

University Committees

- **Fall 2024, Hamad Bin Khalifa University:** Industrial and Government Outreach Committee; ABET & Curriculum; Academic Advising.
- **Spring 2024, Texas A&M University at Qatar:** ABET & Curriculum; Seminars & Invited Speakers; Budget.
- **Fall 2023, Texas A&M University at Qatar:** ABET & Curriculum; Seminars & Invited Speakers; Budget; Teaching Load Model.

Professional Engagements

Nature Scientific Reports	Editorial Board Member	2023 - Present
Manning	Technical Editor	2023 - Present
Pearson	Data Science Advisory Board Member	2023 - 2024

Organizing Conferences

- **Organizing Committee Member of the 19th International Conference on Compatibility, Power Electronics and Power Engineering (CPE-POWERENG 2025):** Special session on AI-Driven Innovations in Renewable Energy: Challenges and Future Directions.
- **Organizing Committee Member of The 11th IEEE International Conference on Data Science and Advanced Analytics (DSAA'24):** Special session on Advancing Materials Science through Data Science: Innovations, Applications, and Challenges.
- **Program Committee Member of the 8th, 7th, and 6th Basarim High-Performance Computing Conference (Basarim'24, '22, '20):** Engaged in reviewing and selecting high-quality submissions for presentations and publications.
- **Session Chair of the International Joint Conference on Artificial Intelligence (IJCAI)**, Jeju, South Korea, 2024.
- **Session Chair of the 11th IEEE International Conference on Data Science and Advanced Analytics (DSAA)**, San Diego, United States, 2024.
- **Session Chair of the IEEE International Conference on Big Data**, Sorrento, Italy, 2023.

Reviewer Contributions I have had the privilege of serving as a peer reviewer for a diverse array of prestigious journals and conferences across multiple disciplines, including but not limited to:

- *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD)*, *The International Conference on Learning Representations (ICLR)*, *Concurrency and Computation: Practice and Experience*, *Journal of Energy Storage*, *Information Sciences*, *Machine Learning: Science and Technology*, *eTransportation*, *Computers in Biology and Medicine*, *Basarim*.

Invited Talks

- *TDCM25: A Multi-Modal Multi-Task Benchmark for Temperature-Dependent Crystalline Materials*
  The Thirteenth International Conference on Learning Representations (ICLR), Singapore, 2025.
- *BlinkAI: A Non-Verbal Communication Tool for Locked-In Syndrome Patients*
  AI and Medicine, Sidra Medicine, Doha, Qatar, 2025.
- *A Reinforcement Learning Approach to Effective Forecasting of Pediatric Hypoglycemia in Diabetes I Patients: an extended de Bruijn Graph*
  AI and Medicine, Sidra Medicine, Doha, Qatar, 2025.
- *BlinkAI: A Non-Verbal Communication Tool for Locked-In Syndrome Patients*
  Web Summit, Doha, Qatar, 2025.
- *AI-Driven Innovation in Medicine: Success, Failure & Challanges*
  3rd Surgical Annual Research Day, Sidra Medicine, Doha, Qatar, 2025.
- *AI Powered Innovation: Driving Organization*
  Future Leaders Programme, Muscat, Oman, 2024
- *p-ClustVal: A Novel p-adic Approach for Enhanced Clustering and Valuation in High-Dimensional scRNASeq Data*
  The 11th IEEE International Conference on Data Science and Advanced Analytics (DSAA 2024) , San Diego, USA, 2024.
- *What Data-Centric AI Can Do For k-means: a Faster, Robust k-means-d*
  The 41st International Conference on Machine Learning (ICML), Data-centric Machine Learning Research (DMLR): Datasets for Foundation Models, Vienna, Austria, 2024.
- *Novel NBA Fantasy League driven by Engineered Team Chemistry and Scaled Position Statistics*
  IEEE International Conference on Big Data: Data-Centric AI, Sorrento, Italy, December 15, 2023.
- *Are Sports Awards About Sports? Using AI to Find the Answer*
  ECML/PKDD: 10th Workshop on Machine Learning and Data Mining for Sports Analytics, Turin, Italy September 18, 2023.
- *Data-Centric Machine Learning*
  Various Universities (San Jose State, University of Houston, University of Montana, American University of the Middle East, United Arab Emirates University, University of Illinois, Zayed University, University of Missouri, University of South Carolina, etc.), 2022-2023.
- *Clustering in Data Science*
  Department of Statistics and Data Science, Northwestern University, Spring 2022.
- *Comparison of Machine Learning Algorithms for CuO Nanoparticles*
  4th International Conference on Physical Chemistry and Functional Materials (PCFM21), Elazığ, Turkey, April 8, 2021.
- *Practical Data Science: Examining the Correlations between Structural and Electronic Properties of Different Phases of TiO2 Nanoparticles*
  International Conference on Advanced Technologies (ICAT), Istanbul, Turkey, August 12, 2020.
- *Predicting Atom Types of Anatase TiO2 Nanoparticles with Machine Learning*
  International Conference on Engineering and Innovative Materials (ICEIM), Singapore, September 5, 2020.
- *Introduction to Data Science*
  Computer Engineering Department, Izmir Institute of Technology, Spring 2020.

- *Clustering Techniques in Engineering*
  Computer Engineering Department, Yildirim Beyazit University, Spring 2019.
- *Data Science Fundamentals*
  Informatics Department, Istanbul Technical University, Fall 2018.
- *Using Data Analytics to Optimize Public Transportation on a College Campus*
  IEEE International Conference on Data Science and Advanced Analytics (DSAA), Turin, Italy, October 4, 2018.
- *Data Science and Big Data*
  Eli Lilly and Company, Fall 2017.
- *A Novel Approach to Optimization of Iterative Machine Learning Algorithms: Over Heap Structure*
  IEEE International Conference on Big Data (Big Data), Boston, MA, USA, December 14, 2017.
- *Improving Expectation Maximization Algorithm over Stellar Data, Workshop on Management*
  Search and Mining of Massive Repositories of Solar and Stellar Astronomy Data, Boston, MA, USA, December 12, 2017.
- *Case Study: Clustering Big Stellar Data with EM**
  IEEE/ACM International Conference on Big Data Computing, Applications and Technologies (BDCAT), Austin, Texas, USA, December 7, 2017.
- *EM*: An EM Algorithm for Big Data*
  IEEE International Conference on Data Science and Advanced Analytics (DSAA), Montreal, Canada, October 18, 2016.
- *EM Algorithms for Clustering*
  Computer Science Department, Indiana University, Fall 2016.
- *Principal Component Analysis*
  Computer Science Department, Indiana University, Fall 2016.
- *A New Set of Random Forests with Varying Dynamic Data Reduction and Voting Techniques*
  IEEE International Conference on Data Science and Advanced Analytics, Shanghai, China, October 30, 2014.
- *Data Structures and Algorithms*
  Computer Science Department, Indiana University, Spring 2014.
- *Ensemble Models in Machine Learning*
  Computer Science Department, Indiana University, Spring 2013.

Teaching Experience

Instructor

- ENGR 102: Engineering Lab I: Computation (Undergraduate) — Fall 2024, Spring 2025
- ENGR 110: Introduction to Programming (Undergraduate) — Fall 2024, Spring 2025
- ENGR 102: Engineering Lab I: Computation (Undergraduate) — Spring 2024
- ECEN 210: Computer Programming and Algorithms (Undergraduate) — Fall 2023
- ECEN 248: Introduction to Digital Systems Design (Undergraduate) — Fall 2023
- CSCI-B 565: Data Mining (Graduate Level) — Spring 2023

- CSCI-B 365: Introduction to Computers and Programming (Undergraduate) — Spring 2023
- CSCI-C 241: Discrete Structures for Computer Science (Undergraduate) — Fall 2022
- CSCI-C 241: Discrete Structures for Computer Science (Undergraduate) — Summer 2022
- CSCI-B 365: Introduction to Data Analysis and Mining (Undergraduate) — Spring 2022
- CSCI-B 505: Applied Algorithms (Graduate Level) — Fall 2021
- BMH101: Algorithms and Programming I (Undergraduate) — Spring 2019, Fall 2019
- BMH 406: Data Security (Undergraduate) — Spring 2019
- BMH 104: Web and Internet Technologies (Undergraduate) — Spring 2019
- BMH 205: Data Structures (Undergraduate) — Fall 2018
- BMH 413: Artificial Neural Networks (Undergraduate) — Fall 2018, Fall 2019
- BMH 103 Introduction to Computer Engineering (Undergraduate) — Fall 2018, Fall 2019
- CSCI-P 556: Applied Machine Learning (Graduate) — Fall 2017
- INFO-I590: Online Applied Data Mining (Graduate) — Fall 2017
- CSCI-B 351: Elements of Artificial Intelligence (Graduate) — Spring 2018
- CSCI-B 365: Introduction to Data Analysis and Mining (Undergraduate) — Spring 2018

Associate Instructor

- CSCI-B 565: Data Mining (Graduate Level) — Fall 2016
- CSCI-B 351: Elements of Artificial Intelligence (Graduate) — Spring 2017
- CSCI-B 565: Data Mining (Graduate Level) — Fall 2012, Fall 2013, Spring 2015, Spring 2016
- CSCI-B 555: Machine Learning (Graduate) — Spring 2013
- CSCI-C 343: Data Structures (Undergraduate/Graduate) — Spring 2014
- CSCI-B 365: Seminar in Computer Science: Data Mining (Undergraduate) — Fall 2014, Fall 2015
- CSCI-B 609: Topics in Algorithms and Computing Theory (Graduate) Fall — 2014
- INFO-I590: Real World Data Science (Graduate, Online) - Summer 2016, Sponsored by Eli Lilly

Professional Experience

Hamad Bin Khalifa University, Doha, Qatar

Assistant Professor, College of Science and Engineering
Contact: Dr. Hazem Nounou, `hnounou@hbku.edu.qa`, **Period:** August 2024 - Present

Indiana University Bloomington, IN, USA

Adjunct Associate Professor, Computer Science Department and Data Science Program
Contact: Dr. Yuzhen Ye, `yye@indiana.edu`, **Period:** June 2023 - Present

Texas A&M University, Doha, Qatar

Adjunct Assistant Professor, Electrical and Computer Engineering Department
Contact: Dr. Erchin Serpedin, `eserpedin@qatar.tamu.edu`, **Period:** August 2024 - Present

Texas A&M University, Doha, Qatar
Assistant Professor, Electrical and Computer Engineering Department
Contact: Dr. Erchin Serpedin, eserpedin@qatar.tamu.edu, **Period:** June 2023 - August 2024

Indiana University Bloomington, IN, USA
Visiting Associate Professor, Computer Science Department
Contact: Dr. Yuzhen Ye, yye@indiana.edu, **Period:** July 2021 - June 2023

Siirt University, Siirt, Turkey
Dr. Lecturer, Computer Engineering Department
Contact: Dr. Musa Atas, hakmesyo@gmail.com, **Period:** August 2018 - July 2021

Indiana University Bloomington, IN, USA
Visiting Assistant Professor, Computer Science Department
Contact: Dr. Amr Sabry, sabry@indiana.edu, **Period:** August 2017 - August 2018

Turbo Appeal, Chicago, IL, USA
Data Scientist
Contact: Scott Beason, scottmbeason@gmail.com, **Period:** January 2015 - December 2015

Indiana University Bloomington, IN, USA
Undergraduate Research Mentor
Contact: Dr. Lamara D. Warren, ldwarren@indiana.edu, **Period:** January 2015 - May 2017

Computer and Language Skills

- **Programming Languages:**
  Python, C, C++, C#, Java
- **Technical Software:**
  R, Matlab, OpenCV, Octave, OpenBUGS, WinBUGS, Weka, Tableau, Knime
- **Databases:**
  MySQL, NoSQL, PostgreSQL, SQL Server
- **Languages:**
  Fluent in English, Native in Turkish

References

Available upon request.