

## Hasan Kurban, Ph.D.

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CONTACT INFORMATION    Electrical and Computer Engineering Department    Homepage: [www.hasankurban.com](http://www.hasankurban.com)  
Texas A&M University at Qatar    ✉ E-mail: [hasan.kurban@qatar.tamu.edu](mailto:hasan.kurban@qatar.tamu.edu)  
Education City, Doha, Qatar

RESEARCH INTERESTS    Data Mining, Machine Learning, Big Data, Data Science, Artificial Intelligence

EDUCATION    **Indiana University**, Bloomington, IN, USA    September 2017

- Ph.D. in [Computer Science](#) and minor in [Statistics](#)
- Advisor: Prof. [Mehmet M. Dalkilic](#)
- Committee: Prof. [Predrag Radivojac](#), Prof. [Michael W. Trosset](#), Prof. [Yuzhen Ye](#)
- Thesis: *A Novel Approach to Optimization of Iterative Machine Learning Algorithms: Over Heap Structure*

**Indiana University**, Bloomington, IN, USA    May 2012

- M.Sc. in [Computer Science](#)

**University of Connecticut**, Storrs, CT, USA    July 2010

- Intensive Certificate Program

**Marmara University**, Istanbul, Turkey    June 2009

- Intensive Certificate Program

**Inonu University**, Malatya, Turkey    June 2008

- B.Sc. in [Mathematics](#)

PUBLICATIONS    **Journal Articles** [Refereed]

- J22. **Hasan Kurban**, Parichit Sharma, Salim Erol, Selcuk Temiz and Mehmet M. Dalkilic. “CRISP: Comprehensive Regression for Impedance Spectroscopy Prediction over ELF Regions using AI”, *Nature Communications Engineering*, 2023 (under-review).
- J21. Parichit Sharma, Marcin Malec, **Hasan Kurban**, Oguzhan Kulekci, Mehmet Dalkilic. “Geometric-k-means: A Novel, Exact, Unbounded Distance Calculation Reducing k-means”, *IEEE Transactions on Knowledge and Data Engineering*, 2023 (under-review).
- J20. 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.
- J19. **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.
- J18. Selcuk Temiz, **Hasan Kurban**, Salim Erol and Mehmet M. Dalkilic. “Data on Machine Learning regenerated Lithium-ion battery impedance”. *Data in Brief*, 108698, 2022.
- J17. Marcin S. Malec, **Hasan Kurban** and Mehmet M. Dalkilic. “ccImpute: an accurate and scalable consensus clustering based algorithm to impute dropout events in the single-cell RNA-seq data”. *BMC Methods*, vol.23, pp. 1-17, 2022.
- J16. 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.
- J15. 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.
- J14. **Hasan Kurban** and Mustafa Kurban. “Building Machine Learning Systems for Multi-Atoms Structures: CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> Perovskite Nanoparticles”. *Computational Materials Science*, 195, 110490(1-9), 2021.

- J13. **Hasan Kurban**, Mustafa Kurban, Parichit Sharma and Mehmet M. Dalkilic . “Predicting Atom Types of Anatase TiO<sub>2</sub> Nanoparticles with Machine Learning”. *Key Engineering Materials*, vol.880, pp.89-94, 2021.
- J12. **Hasan Kurban** and Mustafa Kurban. “Rare-class Learning over Mg-Doped ZnO Nanoparticles”. *Chemical Physics*, vol.546, 11159(1-9), 2021.
- J11. 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.
- J10. **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.
- J9. **Hasan Kurban**. “Atom Classification with Machine Learning and Correlations among Physical Properties of ZnO Nanoparticle”. *Chemical Physics*, vol.545, 111143(1-9), 2021.
- J8. **Hasan Kurban**. “Measuring the Proximity of Medical Treatment Areas with Text Mining”. *European Journal of Science and Technology*, no.21, pp. 518-526, 2021.
- J7. **Hasan Kurban**. “Practical Data Science: Examining the Correlations between Structural and Electronic Properties of Different Phases of TiO<sub>2</sub> Nanoparticles”. *Journal of Selcuk-Technic*, 4(19), 1-9, 2020.
- J6. **Hasan Kurban**, Mehmet Dalkilic, Selcuk Temiz and Mustafa Kurban. “Tailoring the structural properties and electronic structure of anatase, brookite and rutile phase TiO<sub>2</sub> nanoparticles: DFTB calculations”. *Computational Materials Science*, 183, 109843 (1-9), 2020.
- J5. **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.
- J4. 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.
- J3. **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.
- J2. **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.
- J1. 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.

#### **Conference Proceedings** [Refereed]

- 13. Mert Onur Cakiroglu, **Hasan Kurban**, Parichit Sharma, Elham Khorasani Buxton, M. Oguzhan Kulekci, Maryam Raeeszadeh-Sarmazdeh, Haixu Tang and Mehmet Dalkilic. “Efficient Feature Engineering Over Unstructured Data for Use with Traditional AI Models”, *Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS)*, New Orleans, LA, USA, 2023 (under-review).
- 12. Ganesh Arkanath, Nishad Gupta, Parichit Sharma, Madhavan K R, **Hasan Kurban**, Elham Khorasani Buxton and Mehmet M. Dalkilic . “Making Fantasy Leagues More Real: Adding Team Chemistry”, *ECML/PKDD: 10th Workshop on Machine Learning and Data Mining for Sports Analytics*, Turin, Italy, 2023 (under-review).
- 11. Anshumaan Shankar, Gowtham Veerabadran Rajasekaran, Jacob Hendricks, Jared Andrew Schlak, Parichit Sharma, Madhavan K R, **Hasan Kurban** and Mehmet M. Dalkilic. “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, 2023 (under-review).
- 10. 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”, *40th IEEE International Conference on Data Engineering (ICDE)*, Utrecht, Netherlands, 2023 (under-review).

- C9. Josh Elms, Sam Johnson, Madhavan K R, Keerthana Sugasi, Parichit Sharma, **Hasan Kurban** and Mehmet M. Dalkilic. “AReS: An AutoML Regression Service for Data Analytics and Novel Data-centric Visualizations”. *KDD Undergraduate Consortium (KDD-UC)*, Long Beach, CA, USA, 2023 (accepted).
- C8. Sam Johnson, Josh Elms, Madhavan K R, Keerthana Sugasi, Parichit Sharma, **Hasan Kurban** and Mehmet M. Dalkilic. “Are They What They Claim: A Comprehensive Study of Ordinary Linear Regression Among the Top Machine Learning Libraries in Python”. *KDD Undergraduate Consortium (KDD-UC)*, Long Beach, CA, USA, 2023 (accepted).
- C7. **Hasan Kurban**, Parichit Sharma and Mehmet M. Dalkilic. “Data Expressiveness and Its Use in Data-centric AI”. *Neurips Data-centric AI*, 2021.
- C6. **Hasan Kurban**, Mustafa Kurban and Mehmet M. Dalkilic. “Size Dependent Electronic Structure and Structural Properties of Cupric Oxide (CuO) Nanoparticles”. *International Natural Science, Engineering and Material Technologies Conference (NEM)*, Istanbul, Turkey, 2019.
- C5. Kurt Zimmer, **Hasan Kurban**, Mark Jenne, Logan Keating, Perry Maull, Mehmet M. Dalkilic. “Using Data Analytics to Optimize Public Transportation on a College Campus”. *IEEE International Conference on Data Science and Advanced Analytics (DSAA)*, Turin, Italy, 2018.
- C4. **Hasan Kurban**, Mehmet M. Dalkilic. “A novel approach to optimization of iterative machine learning algorithms: over heap structure”. *IEEE International Conference on Big Data (Big Data)*, Boston, MA, USA, 2017.
- C3. **Hasan Kurban**, Mark Jenne and Mehmet M. Dalkilic. “EM\*: An EM algorithm for Big Data”. *IEEE International Conference on Data Science and Advanced Analytics (DSAA)*, Montreal, Canada (received “Honorable Mention Paper Award”, best paper awards), 2016.
- C2. Hussein Mohsen, **Hasan Kurban**, Kurt Zimmer, Mark Jenne, Mehmet M. Dalkilic. “Red-RF: Reduced Random Forest for big data using priority voting & dynamic data reduction, International Congress on Big Data”. *IEEE BigData Congress*, New York, USA, 2015.
- C1. Hussein Mohsen, **Hasan Kurban**, Mark Jenne, Mehmet M. Dalkilic. “A new set of Random Forests with varying dynamic data reduction and voting techniques”. *IEEE International Conference on Data Science and Advanced Analytics (DSAA)*, Shanghai, China, 2014.

#### **Workshop Proceedings** [Refereed]

- W2. **Hasan Kurban**, Can Kockan, Mark Jenne and Mehmet M. Dalkilic. “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, 2017.
- W1. Mark Jenne, Alex Zimmerman, **Hasan Kurban**, Claudia Johnson and Mehmet M. Dalkilic. “Employing Software Engineering Principles to Enhance Management of Climatological Datasets for Coral Reef Analysis”. *The 6th International Workshop on Climate Informatics (CI)*, Colorado, USA, 2016.

#### **Poster Proceedings** [Refereed]

- P1. **Hasan Kurban**, Can Kockan, Mark Jenne and Mehmet M. Dalkilic. “Case study: clustering big stellar data with EM\*”. *IEEE/ACM International Conference on Big Data Computing, Applications and Technologies (BDCAT)*, Austin, Texas, USA (received “Best Poster Award”), 2017.

#### **Abstract Proceedings** [Refereed]

- A1. **Hasan Kurban**. “Comparison of Machine Learning Algorithms for CuO Nanoparticles”. *4th International Conference on Physical Chemistry and Functional Materials (PCFM21)*, Elazığ, Turkey, 2021.

#### **Book Reviews**

- B2. “Mastering Social Media Mining with R”, Sharan Kumar Ravindran, 2015, ISBN 1784396311
- B1. “Learning Data Mining with R”, Biter Makhabel, 2015, ISBN 1783982101

**Invited Talks** [Conferences]

- “Comparison of Machine Learning Algorithms for CuO Nanoparticles”. *4th International Conference on Physical Chemistry and Functional Materials (PCFM21)*, Elazığ, Turkey (04/08/2021).
- “Predicting Atom Types of Anatase TiO<sub>2</sub> Nanoparticles with Machine Learning”. *International Conference on Engineering and Innovative Materials (ICEIM)*, Singapore (09/05/2020).
- “Practical Data Science: Examining the Correlations between Structural and Electronic Properties of Different Phases of TiO<sub>2</sub> Nanoparticles”. *International Conference on Advanced Technologies (ICAT)*, Istanbul, Turkey (08/12/2020).
- “Using Data Analytics to Optimize Public Transportation on a College Campus”. *IEEE International Conference on Data Science and Advanced Analytics (DSAA)*, Turin, Italy (10/4/2018).
- “A novel approach to optimization of iterative machine learning algorithms: over heap structure”. *IEEE International Conference on Big Data (Big Data)*, Boston, MA, USA (12/14/2017).
- “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 (12/12/2017).
- “Case study: clustering big stellar data with EM\*”. *EEE/ACM International Conference on Big Data Computing, Applications and Technologies (BDCAT)*, Austin, Texas, USA (12/07/2017).
- “EM\*: An EM algorithm for Big Data”. *IEEE International Conference on Data Science and Advanced Analytics (DSAA)*, Montreal, Canada (10/18/2016).
- “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 (10/30/2014).

**Invited Talks** [Teaching/Hiring]

- “Clustering”. *Department of Statistics and Data Science, Northwestern University*, Spring 2022.
- “Data-Centric Machine Learning”. *San Jose State University, University of Houston, University of Montana, American University of the Middle East, United Arab Emirates University, University of Illinois Springfield, Zayed University, University of Missouri, University of South Carolina* 2022-2023.
- “Data Science”. *Computer Engineering Department, Izmir Institute of Technology*, Spring 2020.
- “Clustering”. *Computer Engineering Department, Yildirim Beyazit University*, Spring 2019.
- “Data Science”. *Informatics Department, Istanbul Technical University*, Fall 2018
- “Data Science and Big Data”. *Eli Lilly and Company*, Fall 2017.
- “EM for clustering”. *Computer Science Department, Indiana University*, Fall 2016.
- “Principal Component Analysis”. *Computer Science Department, Indiana University*, Fall 2016.
- “Data Structures”. *Computer Science Department, Indiana University*, Spring 2014.
- “Ensemble Models”. *Computer Science Department, Indiana University*, Spring 2013.

**Research Assistant Professor, Electrical and Computer Engineering Department**, Texas A&M University, Doha, Qatar

- ECEN 210 Computer Programming and Algorithms (Undergraduate), Fall 2023.
- ECEN 248 Introduction to Digital Systems Design (Undergraduate), Fall 2023.

**Visiting Associate Professor, Computer Science Department**, Indiana University, IN, USA

- Applied Algorithms (Graduate), Fall 2021.
- Introduction to Data Analysis and Mining (Undergraduate), Spring 2022.

- Discrete Structures for Computer Science (Undergraduate), Summer 2022, Fall 2022.
- Data Mining (Graduate), Spring 2023.
- Introduction Computers and Programming (Undergraduate), Spring 2023.

***Dr. Lecturer, Computer Engineering Department***, Siirt University, Turkey

- Data Structures, Artificial Neural Networks, Introduction to Computer Engineering, Fall 2018.
- Data Security, Algorithms and Programming II, Web and Internet Technologies, Spring 2019.
- Algorithms and Programming I, Artificial Neural Networks, Introduction to Computer Engineering, Fall 2019.

***Visiting Assistant Professor, Computer Science Department***, Indiana University, IN, USA

- Applied Machine Learning (Graduate), Online Applied Data Mining (Graduate), Fall 2017.
- Elements of Artificial Intelligence (Graduate), Introduction to Data Analysis and Mining (Undergraduate), Spring 2018.

***Associate Instructor, Computer Science Department***, Indiana University, IN, USA

Worked as an Associate Instructor in the Computer Science Department at Indiana University Bloomington between Aug. 2012 - May 2016. Graded homeworks, exams, weekly quizzes; taught labs; held office hours, weekly help sessions; lectured.

- Data Mining (Graduate), Fall 2012, Fall 2013, Spring 2015, Spring 2016.
- Machine Learning (Graduate), Spring 2013.
- Data Structures (Undergraduate/Graduate), Spring 2014.
- Seminar in Computer Science: Data Mining (Undergraduate), Fall 2014, Fall 2015.
- Topics in Algorithms and Computing Theory (Graduate), Fall 2014.
- Real World Data Science (Graduate), Summer 2016: Online class sponsored by Eli Lilly and Company.

***Senior Associate Instructor, Computer Science Department***, Indiana University, IN, USA

Head Associate Instructor (AI). Managed a group of AIs; lectured; designed homeworks; graded homeworks, exams.

- Data Mining (Graduate), Fall 2016.
- Introduction to Artificial Intelligence (Graduate), Spring 2017.

PROFESSIONAL EXPERIENCE ***Texas A&M University***, Doha, Qatar

- Research Assistant Professor, Electrical and Computer Engineering Department (June 2023 - Current).
- Contact: Erchin Serpedin, [eserpedin@qatar.tamu.edu](mailto:eserpedin@qatar.tamu.edu)

***Indiana University Bloomington***, IN, USA

- Visiting Associate Professor, Computer Science Department (July 2021 - June 2023).
- Contact: Yuzhen Ye, [yye@indiana.edu](mailto:yye@indiana.edu)

***Siirt University***, Siirt, Turkey

- Dr. Lecturer, Computer Engineering Department (Aug. 2018 - July 2021).
- Contact: Musa Atas, [hakmesyo@gmail.com](mailto:hakmesyo@gmail.com)

**Indiana University Bloomington, IN, USA**

- Visiting Assistant Professor, Computer Science Department (Aug. 2017 - Aug. 2018).
- Contact: Amr Sabry, sabry@indiana.edu

**Turbo Appeal, Chicago IL, USA**

- Data Scientist (Jan 2015 - Dec. 2015): Predictive analytics on valuation of homes; web scraping; stored, processed, analyzed, modeled big data sets.
- Contact: Scott Beason, scottmbeason@gmail.com

**Indiana University Bloomington, IN, USA**

- Undergraduate Research Mentor (Jan. 2015 - May 2017): Designed data mining research projects for undergraduate students; coached students.
- Contact: Dr. Lamara D. Warren, ldwarren@indiana.edu

**SERVICE**

- **Nature Scientific Reports:** Editorial Board Member, 2023 -current.
- **Pearson:** Data Science Advisory Board Member, 2023 - current.
- **Manning:** Technical Editor, 2023 - current.

**HONORS AND AWARDS**

- **Best Paper Award:** Honorable Mention Paper Award, IEEE International Conference on Data Science and Advanced Analytics (DSAA'16), Montreal, Canada, 2016.
- **Best Poster Award:** IEEE/ACM International Conference on Big Data Computing, Applications and Technologies (UCC/BDCAT), Austin, TX, USA, 2017.
- **Turkish National Ministry of Education Scholarship :** (all tuitions, fees, and a stipend) Scholarship awarded to high-achieving Turkish university graduates enabling them to pursue graduate study and research in top-ranked universities abroad, 2009 - 2017.
- **Computer Science Graduate Fellowship:** Indiana University, Bloomington, Aug. 2010 - May 2012.
- **Nomination for Associate Instructor of the year:** Being nominated for the Computer Science Program Associate Instructor of the year award, 2014 - 2015, Indiana University Bloomington.
- **Nomination for Researcher of the year:** Being nominated for the Computer Science Program Researcher of the year award, 2016 - 2017, Indiana University Bloomington.

**COMPUTER AND LANGUAGE SKILLS**

- **Programming Languages:** Python, C, C++, C#, Java.
- **Technical Softwares:** R, Matlab, OpenCV, Octave, OpenBUGS, WinBUGS, Weka, Rattle, Tableau, Knime.
- **Databases:** MySQL, NoSQL, PostgreSQL, SQL Server.
- **Languages:** English (fluent), Turkish (native).

**REFERENCES**

*Available upon request.*