Abdullah Mueen

Curriculum Vitae

University of New Mexico
Department of Computer Science
MSC01 1130, 1 University of New Mexico
Albuquerque, NM 87131-0001

mueen@unm.edu
http://www.abdullahmueen.com
Office: +1 (505) 277 1914
Fax: +1 (505) 277 6927

Research Interest

Temporal Data Mining-Social Media Mining - Focusing on trust, security, scalability and interactivity.

Professional Preparation

2012 **PhD (Computer Science)**, University of California, Riverside, CA
Dissertation: "Exact primitives for time series data mining," Adviser: Dr. Eamonn Keogh

2006 **BSc (Computer Science)**, Bangladesh University of Engineering and Technology
Dissertation: "Applications of graphs in bioinformatics," Adviser: Dr. Saidur Rahman

Appointments

2013- **Assistant Professor**, Department of Computer Science, University of New Mexico
2013 **Scientist**, Cloud and Information Services Lab, Microsoft Corporation
2012 **Program Manager**, Online Services Division, Microsoft Corporation
2009-2011 **Summer Research Intern**, Microsoft Research and HP Labs

Awards and Honors

2016 Best paper nomination, ICDM 2016
2012 **Runner-up**, Doctoral Dissertation Award, SIGKDD 2012
2012 **Best paper award**, SIGKDD 2012
2010 Travel grants from three top conferences: KDD, SIGMOD and ICDM
2009 Best paper nomination, ICDM 2009
2007 **Graduate Research Fellowship**, University of California at Riverside
2006 **Champion**, webpage development contest for computer science department http://www.buet.ac.bd/cse/
2002-2006 Dean's Merit Scholarship for every undergraduate semester

Refereed Journal Papers

Student advisees are underlined

J1 Abdullah Mueen, Nikan Chavoshi, Noor Abu-El-Rub, Hossein Hamooni, Amanda J. Minnich and Jonathan MacCarthy. Speeding up dynamic time warping distance for sparse time series data. *Knowl. Inf. Syst.* 54(1): 237-263 (2018)

J2 Yan Zhu, Zachary Zimmerman, Nader Shakibay Senobari, Chin-Chia Michael Yeh, Gareth Funning, Abdullah Mueen, Philip Brisk, Eamonn J. Keogh: Exploiting a novel algorithm and GPUs to break the ten quadrillion pairwise comparisons barrier for time series motifs and joins. *Knowl. Inf. Syst.* 54(1): 203-236 (2018)

J3 Chin-Chia Michael Yeh, Yan Zhu, Liudmila Ulanova, Nurjahan Begum, Yifei Ding, Hoang Anh Dau, Zachary Zimmerman, Diego Furtado Silva, Abdullah Mueen, Eamonn J. Keogh: Time series joins, motifs, discords and shapelets: a unifying view that exploits the matrix profile. *Data Min. Knowl. Discov.* 32(1): 83-123 (2018)

J4 James F. Cavanagh, Praveen Kumar, Andrew Mueller, Pirio Richardson, S. and Abdullah Mueen: Diminished EEG habituation to novel events effectively classifies Parkinson's patients. *Clinical Neurophysiology*, 129: 409-418 (2018)

J5 James F. Cavanagh, Arthur Napolitano, Christopher Wu, and Abdullah Mueen: The Patient Repository for EEG Data + Computational Tools. *Frontiers in NeuroInformatics* 11: 67 (2017)

J6 Jesin Zakaria, Abdullah Mueen, Eamonn J. Keogh, Neal E. Young: Accelerating the discovery of unsupervised-shapelets. *Data Min. Knowl. Discov.* 30(1): 243-281 (2016)

J7 Hossein Hamooni, Abdullah Mueen and Amy Neel. Phoneme Sequence Recognition via DTW-based classification. *Knowl. Inf. Syst.* 48(2): 253-275 (2015).

J8 Abdullah Mueen and Nikan Chavoshi. Enumeration of time series motifs of all lengths. *Knowl. Inf. Syst.* 45(1): 105-132 (2015).

J9 Abdullah Mueen. Time series motif discovery: dimensions and applications. *Wiley Interdisc. Rew. Data Mining and Knowledge Discovery* 4(2): 152-159 (2014).

J10 Xiaoyue Wang, Abdullah Mueen, Hui Ding, Goce Trajcevski, Peter Scheuermann and Eamonn J. Keogh. Experimental comparison of representation methods and distance measures for time series data. *Data Min. Knowl. Discov.* 26(2): 275-309 (2013).

J11 Thanawin Rakthanmanon, Bilson J. L. Campana, Abdullah Mueen, Gustavo E. A. P. A. Batista, M. Brandon Westover, Qiang Zhu, Jesin Zakaria and Eamonn J. Keogh: Addressing Big Data Time Series: Mining Trillions of Time Series Subsequences Under Dynamic Time Warping. *ACM Trans. Knowl. Discov. Data* 7(3): 10 (2013).

J12 Md. Shamsuzzoha Bayzid, Md. Maksudul Alam, Abdullah Mueen and Md. Saidur Rahman. HMEC: A Heuristic Algorithm for Individual Haplotyping with Minimum Error Correction. *ISRN Bioinformatics*, vol. 2013, Article ID 291741, 2013.

J13 Abdullah Mueen, Eamonn J. Keogh, Qiang Zhu, Sydney Cash, M. Brandon Westover and Nima Bigdely Shamlo. A disk-aware algorithm for time series motif discovery. *Data Min. Knowl. Discov*. 22(1-2): 73-105 (2011)

Refereed Conference Papers

Student advisees are underlined

C1 Nikan Chavoshi and Abdullah Mueen. Model Bots, not Humans on Social Media. In *IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, (ASONAM)*: In press.

C2 Amanda Minnich, Nikan Chavoshi, Danai Koutra, and Abdullah Mueen. BotWalk: Efficient Adaptive Exploration of Twitter Bot Networks. In *IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, (ASONAM)*: 467-474 (2017).

C3 Noor Abu-El-Rub, Amanda Minnich and Abdullah Mueen. Anomalous Reviews Owing to Referral Incentive. In *IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, (ASONAM)*: 313-316 (2017).

C4 Noor Abu-El-Rub, Amanda Minnich and Abdullah Mueen. Impact of Referral Incentives on Mobile App Reviews. In *17th International Conference on Web Engineering (ICWE)*: 351-359 (2017).

C5 Nikan Chavoshi, Hossein Hamooni and Abdullah Mueen. On-Demand Bot Detection and Archival System. In *26th International World Wide Web Conference (WWW Companion)*: 183-187 (2017).

C6 Nikan Chavoshi, Hossein Hamooni and Abdullah Mueen. DeBot: Twitter Bot Detection via Warped Correlation. In *16th IEEE International Conference on Data Mining, (ICDM)*: 817-822 (2016).

C7 Abdullah Mueen, Nikan Chavoshi, Noor Abu-El-Rub, Hossein Hamooni, Amanda Minnich. AWarp: Fast Warping Distance for Sparse Time Series. In *16th IEEE International Conference on Data Mining, (ICDM)*: 350-359 (2016)

C8 Chin-Chia Michael Yeh, Yan Zhu, Liudmila Ulanova, Nurjahan Begum, Yifei Ding, Hoang Anh Dau, Diego Furtado Silva, Abdullah Mueen, Eamonn Keogh. Matrix Profile I: All Pairs Similarity Joins for Time Series: A Unifying View that Includes Motifs, Discords and Shapelets. In *16th IEEE International Conference on Data Mining, (ICDM)*: 1317-1322 (2016).

C9 Yan Zhu, Zachary Zimmerman, Nader Shakibay Senobari, Chin-Chia Michael Yeh, Gareth Funning, Abdullah Mueen, Philip Brisk and Eamonn Keogh. Matrix Profile II: Exploiting a Novel Algorithm and GPUs to break the one Hundred Million Barrier for Time Series Motifs and Joins. In *16th IEEE International Conference on Data Mining, (ICDM)*: 739-348 (2016).

C10 Nikan Chavoshi, Hossein Hamooni and Abdullah Mueen. Identifying Correlated Bots in Twitter. In *8th International Conference on Social Informatics, (SOCINFO)*: 14-21 (2016).

C11 Hossein Hamooni, Nikan Chavoshi and Abdullah Mueen. On URL Changes and Handovers in Social Media. In *8th International Conference on Social Informatics, (SOCINFO)*: 58-74 (2016).

C12 Tai Ching Li, Abdullah Mueen, Michalis Faloutsos and Huy Hang. Comment-Profiler: Detecting trends and parasitic behaviors in online comments. In *8th International Conference on Social Informatics, (SOCINFO)*: 75-91 (2016).

C13 Hossein Hamooni, Biplob Debnath, Jianwu Xu, Hui Zhang, Geoff Jiang and Abdullah Mueen. LogMine: Fast Pattern Recognition for Log Analytics. In *ACM International Conference on Information and Knowledge Management, (CIKM)*: 1573-1582 (2016).

C14 Amanda Minnich, Noor Abu-El-Rub, Maya Gokhale, Ronald Minnich, Abdullah Mueen. ClearView: Data Cleaning for Online Review Mining. In *IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, (ASONAM)*: 555-558 (2016).

C15 Amanda Minnich, Nikan Chavoshi, Abdullah Mueen, Shuang Luan and Michalis Faloutsos. TrueView: Harnessing the Power of Multiple Review Sites. In *24th International World Wide Web Conference (WWW)*: 787-797 (2015).

C16 Roya Ensafi, Philipp Winter, Abdullah Mueen and Jedidiah R. Crandall. Analyzing the Great Firewall of China Over Space and Time. In *15th Privacy Enhancing Technologies Symposium (PoPETs)* 2015(1): 61-76 (2015)

C17 Mustafa Cetin, Abdullah Mueen and Vince Calhoun. Shapelet Ensemble for Multi-dimensional Time Series. In *15th SIAM International Conference on Data Mining (SDM)*: 307-315 (2015)

C18 Hossein Hamooni and Abdullah Mueen. Dual-domain Hierarchical Classification of Phonetic Time Series. In *14th IEEE International Conference on Data Mining (ICDM)*: 160-169 (2014)

C19 Abdullah Mueen, Hossein Hamooni and Trilce Estrada. Time Series Join on Subsequence Correlation. In *14th IEEE International Conference on Data Mining (ICDM)*: 450-459 (2014)

C20 Greg Iven, Viktor Chekh, Shuang Luan, Abdullah Mueen, Peter Soliz, Wenyao Xu and Mark Burge. Non-contact Sensation Screening of Diabetic Foot Using Low Cost Infrared Sensors. In *27th International Symposium on Computer-based Medical Systems (CBMS)*: 479-480 (2014)

C21 Xi Chen, Abdullah Mueen, Vijay K. Narayanan, Nikos Karampatziakis, Gagan Bansal and Vipin Kumar. Online Discovery of Group Level Events in Time Series. In *14th SIAM International Conference on Data Mining (SDM)*: 632-640 (2014)

C22 Mahbub Hasan, Abdullah Mueen and Vassilis Tsotras. Distributed Diversification of Large Datasets. In *Second IEEE Conference on Cloud Engineering (IC2E)*: 67-76 (2014)

C23 Abdullah Mueen. Enumeration of Time Series Motifs of All Lengths. In *13th IEEE International Conference on Data Mining (ICDM)*: 547-556 (2013)

C24 Jesin Zakaria, Abdullah Mueen and Eamonn Keogh. Clustering Time series using Unsupervised-Shapelets. In *12th IEEE International Conference on Data Mining (ICDM)*: 785-794 (2012)

C25 Mahbub Hasan, Abdullah Mueen, Vassilis Tsotras and Eamonn Keogh. Diversifying Query Results on Semi-Structured Data. In *21st ACM international conference on Information and knowledge management (CIKM)*: 2099-2103 (2012).

C26 Thanawin Rakthanmanon, BIlson Campana, Abdullah Mueen, Gustavo Batista, M. Brandon Westover, Qiang Zhu, Jesin Zakaria and Eamonn Keogh. Searching and Mining Trillions of Time Series Subsequences under Dynamic Time Warping. In *18th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*: 262-270 (2012)

C27 Jesin Zakaria, Sarah Rotschafer, Abdullah Mueen, Khaleel Razak and Eamonn Keogh. Mining Massive Archive of Mice Sounds with Symbolized Representations. In *12th SIAM International Conference on Data Mining (SDM)* 588-599 (2012)

C28 Bing Hu, Thanawin Rakthanmanon, Bilson Campana, Abdullah Mueen and Eamonn Keogh. Image Mining of Historical Manuscripts to Establish Provenance. In *12th SIAM International Conference on Data Mining (SDM)*: 804-815 (2012)

C29 Abdullah Mueen, Eamonn Keogh and Neal Young. Logical-Shapelets: An Expressive Primitive for Time Series Classification. In *17th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*: 1154-1162 (2011)

C30 Doruk Sart, Abdullah Mueen, Walid Najjar, Vit Niennattrakul and Eamonn Keogh. Accelerating Dynamic Time Warping Subsequence Search with GPUs and FPGAs. In *10th IEEE International Conference on Data Mining (ICDM)*: 1001-1006 (2010)

C31 Abdullah Mueen and Eamonn Keogh. Online Discovery and Maintenance of Time Series Motif. In *16th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*: 1089-1098 (2010)

C32 Abdullah Mueen, Suman Nath and Jie Liu. Fast Approximate Correlation for Massive Time-Series Data. In *ACM SIGMOD International Conference on*

Management of data (SIGMOD): 171-182 (2010)

C33 Abdullah Mueen, Eamonn Keogh and Nima Bigdely-Shamlo. Finding Time Series Motifs in Disk-Resident Data. In *9th IEEE International Conference on Data Mining (ICDM)*: 367-376 (2009)

C34 Abdullah Mueen, Eamonn Keogh, Qiang Zhu, Sydney Cash and M. Brandon Westover. Exact Discovery of Time Series Motifs. In *9th SIAM International Conference on Data Mining (SDM)*: 473-484 (2009)

C35 Abdullah Al Mueen, Md. Shamsuzzoha Bayzid, Md. Maksudul Alam and Md. Saidur Rahman. A heuristic algorithm for individual haplotyping with minimum error correction. In *BioMedical Engineering and Informatics, (BMEI)*, vol. 1, pp. 792-796 (2008)

Patents

P1 Abdullah Mueen, Nikan Chavoshi, A Method to Detect Bots in Social Media. (STC Ref. # 2016-003).

P2 Gagan Bansal, Vijay K. Narayanan and Abdullah Mueen, Seasonality detection in time series data, US20150377938.

P3 Shuang Luan, Abdullah Mueen, Amanda Minnich and Michalis Faloutsos. Online review assessment using multiple sources, US20160070709.

P4 Abdullah Mueen, Krishnamurthy Viswanathan and Chetan Gupta. Similarity search initialization. US20130290350.

P5 Abdullah Mueen, Krishnamurthy Viswanathan and Chetan Gupta. Determining distance between data sequences. US20130226904.

P6 Doruk Sart, Abdullah Mueen, Walid Najjar and Eamonn Keogh. Hardware Acceleration of Dynamic Time Warping Algorithm using FPGAs. UC2011-617-1

Research Grants

1.6M Total UNM budget committed to Abdullah Mueen *(shown to the left of each grant)*

918K Total UNM budget committed to Abdullah Mueen as Principal Investigator

Active Grants

$293K NSF #1527127, *CCF: SHF: Small: Collaborative Research: Domain-specific Reconfigurable Processor for Time-Series Data Mining and Monitoring*, PI: Abdullah Mueen, $293K, 09/1/2015 - 08/30/2020.

$43K NIH COBRE *Center for Brain Recovery and Repair Subproject* (NIGMS 1P20GM109089), PI: James Cavanaugh, Co-PI: Abdullah Mueen, $500K, 09/15/2015-06/30/2020.

$137K DARPA STTR through Tau Technologies, *Interacting Swarms: Immune System to Social Media*, PI: Judy Cannon, Co-PI: Melanie Moses, Abdullah Mueen, $667K, 12/2017-06/2019.

$485K AFRL, *Advanced Time Series Data Mining Methods for Seismic Signal Discovery and Detection*, PI: Abdullah Mueen, $485K, 07/2017 - 06/2020.

$556K NSF RII Track-1: *The New Mexico SMART Grid Center: Sustainable, Modular, Adaptive, Resilient, and Transactive*, PI: William Michener, Co-PI: Anne Jackle, $20M, Subaward to Abdullah Mueen for the amount $556K, 9/2018 - 8/2023

Cloud Credit

$40K Microsoft Azure Research Award, Azure credit worth $40K, PI: Abdullah Mueen. 11/2014-12/2016

Prior Grants

$65K ExxonMobil Upstream Research Company, *Discovering Subsurface Flow Patterns using Downhole Pressure Measurements*, PI: Abdullah Mueen, $65K, 12/2017-08/2018

$10K Office of Vice President of Research, UNM, *PRED+CT: A Patient Repository of EEG Data & Computational Tools*, PI: James Cavanagh, Co-PI: Abdullah Mueen, $20K, 7/2016 - 6/2017.

$75K Los Alamos National Laboratory, *F-Electron Database*, PI: Abdullah Mueen, $75K, 05/2016 – 05/2017.

Teaching

Fall 2018	CS 521: Data Mining
	CS 592: Colloquium
Spring 2018	CS 533: Experimental Methods in Computer Science
Fall 2017	CS 521: Data Mining
	CS 592: Colloquium
Spring 2017	CS 564/464: Database Management Systems
Fall 2016	CS 521: Data Mining
Spring 2016	CS 564/464: Database Management Systems
Fall 2015	CS 521: Data Mining
Spring 2015	CS 564/464: Database Management Systems
Fall 2014	CS 591.03: Data Mining
Spring 2014	CS 564/464: Database Management Systems
Fall 2013	CS 591.03: Data Mining

Students and Research Advisement

Graduated PhD Students

First employment after graduation is mentioned

Dr. Mustafa Sinan Cetin, PhD, *co-advised with Prof. Vince Calhoun*, Spring 2015, Data Scientist at *Intel*

Dr. Amanda Minnich, PhD, Summer 2017, Staff Scientist, Lawrence Livermore National Laboratory

Dr. Hossein Hamooni, PhD, Summer 2017, Technical Staff, VISA Research

Dr. Nikan Chavoshi, PhD, Spring 2018, Software Engineer, Oracle Corporation

Dr. Ian Roy Beaver, PhD, Spring 2018, Senior Research Engineer, Verint Systems

Graduated MS Students

Sihan Zhao, Fall 2014

Daniel De Francisco Cabral, Spring 2015

Duaa Momani, Fall 2015, Self-emplyed

Aaron Gonzales, Spring 2016, *Co-advised with Prof. Dorian Arnold,* Data Scientist, Tripadvisor

Adnan Ibn Khair, Fall 2018, Software Engineer, Amazon

Current Students

Noor Abu-El-Rub, PhD candidate, expected Spring 2019
Cynthia Freeman, 4th year PhD student
Mohammad Ashraf Siddiquee, 3rd year PhD student
Zeinab Akhavan, 2nd year PhD student
Sheng Zhong, 2nd year PhD Student
Lawrence Clyde Allen, 2nd year MS student
Farhan Asif Chowdhury, 2nd year MS Student
Jennifer Longo, Undergraduate Student

Professional Services and Activities

Tutorials

BIGDATA 2017	Abdullah Mueen, Eamonn Keogh. Matrix Profile: A Unified Approach to Time Series Data Mining
KDD 2017	Abdullah Mueen, Eamonn Keogh. Matrix Profile: A Unified Approach to Time Series Data Mining
CIKM 2016	Abdullah Mueen. Similarity Search on Time Series Data: Past, Present, and Future
DSAA 2016	Abdullah Mueen. Similarity Search on Time Series Data: Past, Present, and Future
KDD 2016	Abdullah Mueen, Eamonn Keogh. Extracting Optimal Performance from Dynamic Time Warping
ICDM 2014	Abdullah Mueen, Eamonn Keogh. Finding Repeated Structure in Time Series Data
SDM 2015	Abdullah Mueen, Eamonn Keogh. Finding Repeated Structure in Time Series Data
Cyberday 2014	Abdullah Mueen, Successful Cases in Scientific Data Mining

Workshops

KDD 15-18	Mining and Learning from Time Series (MiLeTS), Co-Chair.

Colloquia

2018	***CIA site visit at UNM:*** DeBot: An On-demand Bot Detection System ***4th annual BRAIN Initiative Investigators Meeting BRAIN Conference:*** Data Mining Methods for Brain Signals ***Colloquium for Machine Learning Research Fellows, Los Alamos National Lab:*** Matrix Profile: A Unifying Approach to Time Series Data Mining
2017	***Technical Interchange Meeting at AFRL, Satellite Beach, FL:*** Dynamic Time Warping: Implications for Seismic Data Analysis ***International Conference on Networking, Systems and Security (4th NSysS 2017):*** *DeBot: An On-demand Bot Detection System, Keynote*
2016	***ExxonMobil Upstream Research:*** Time Series Motif Discovery: Problems, its Variants and Solutions ***Acoustical Society of America (ASA) Topical Meeting "Data Science and Acoustics":*** Primitives in time series mining: Algorithms and applications ***Materials Science/Data Technology Nexus: Los Alamos National Laboratory:*** Temporal Pattern Mining and Machine Learning for Material Science

2015 ***NASA Langley Research Center, Virginia*:** (Un)supervised Pattern Mining from Time Series Data for Knowledge Discovery

2014 ***New Mexico State University, CS Colloquium***: Exact Discovery of Time Series Motifs

***UNM Techday*:** Review Fraud Detection

UNM STC Technology Social: Review Fraud Detection

UC Davis Network Lab: Successful Cases in Scientific Data Mining

***Los Alamos National Lab, BigDIG Meeting*:** Variable Length Pattern Mining from Time Series Data

2013 ***CS Colloquium at UNM*:** Variable Length Pattern Mining from Time Series Data

***CS Colloquium at SUNY Albany*:** Fast Primitives for Time Series Data Mining

***CS Colloquium at University of Alabama, Birmingham*:** Fast Primitives for Time Series Data Mining

***Yahoo! Research at Sunnyvale, CA*:** Fast Primitives for Time Series Data Mining

***Teradata Corporation at Los Angeles, CA*:** Fast Primitives for Time Series Data Mining

Conference Technical Program Committee Member

KDD ACM SIGKDD Conference on Data Mining and Knowledge Discovery (2012, 2015-2018)

SDM SIAM Conference on Data Mining (2013-2018)

ICDM IEEE International Conference on Data Mining (2013-2016)

CIKM ACM Conference on Information and Knowledge Management (2014-2018)

BIGDATA IEEE International Conference on Big Data (2016-2018)

ICTAI International Conference on Tools with Artificial Intelligence (2016)

WSDM ACM International Conference on Web Search and Data Mining (2017-2018)

AAAI The AAAI Conference on Artificial Intelligence (2014,2018)

WWW The Web Conference (2018)

Editorial Board Member

2016- Data Mining and Knowledge Discovery (**DMKD**)

Journal Reviewer

TKDE IEEE Transactions on Knowledge and Data Engineering (2013-18)

TWeb ACM Transactions on the Web (2018)

DMKD Data Mining and Knowledge Discovery (2011-18),

KAIS Knowledge and Information Systems (2013-14),

TPDS IEEE Transactions on Parallel and Distributed Systems (2015)

Grant Proposal Review Panel

2018 National Science Foundation, CISE Information Science SBIR Program

2015 National Science Foundation, Smart and Connected Health program

2014 National Science Foundation, CISE BigData program

Media Coverage

2018 Interviewed by Washington Post for article "Twitter is sweeping out fake

	accounts like never before, putting user growth at risk" on July 2018
2017	Interviewed by CBS 60 Minutes show "Fake News" on January 2017
2016	Interviewed by KQRE for "Battling Bad Bots: UNM researchers work to keep Twitter real" on November 2016
2015	Interviewed by KQRE for "UNM developing trustworthy travel website" on July 2015

University Service

2015-19	Member of Graduate Admissions Committee
2016-19	CS Undergraduate Tutor Program
2018	Dissertation Awards Committee
2018	CS Faculty Search Committee
2016-18	Mentor: NSF STEP Program
2014-16	CS Outreach Taskforce
2014	CyberInfrastructure Day Organizing Committee