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# Abdullah A. Mueen

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## Education

PhD (**March 2012**),

Department of Computer Science and Engineering,

University of California, Riverside.

Adviser: **Dr. Eamonn Keogh**

Dissertation Topic: **Exact Primitives for Time Series Data Mining**

Runner-up ACM SIGKDD 2012 **Doctoral Dissertation Award**

B.Sc. in Computer Science & Engineering (2006),

Bangladesh University of Engineering & Technology.

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## Research Interest

**Data mining** on (semi/un)structured data such as streaming and archived time series, videos, XMLs, etc. Development of efficient, parallel and distributed algorithms for applications in knowledge-discovery, database and intelligent systems.

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## Work Experience

- † **Scientist** at Microsoft Corporation, Redmond. (Nov'12-Current)  
⇒ Working in the Cloud and Information Services Lab. Major focus on log analytics in the cloud for failure prediction and health monitoring of database systems.
- † **Program Manager** at Bing, Microsoft Corporation, Bellevue. (Apr'12-Oct'12)  
⇒ Worked in the core ranking team. Managed projects on developing and tuning learning algorithms for **rankers** while optimizing customer focused **metrics**.
- † **Research Intern** at Hewlett-Packard Laboratories, Palo Alto. (Jun'11-Sep'11)  
⇒ Worked on speeding up **In-memory Similarity Search** for multidimensional time series. Developed suffix tree based **search initialization** technique to boost performance of standard algorithms.
- † **Research Intern** at Microsoft Research, Redmond. (Mar'10-Jun'10)  
⇒ Worked on real-time maintenance of **Discrete Fourier Coefficients** for the most recent sliding window of a streaming time series.
- † **Research Intern** at Microsoft Research, Redmond. (Jun'09-Sep'09)  
⇒ Worked on approximately finding **All-Pair Correlation** matrix in large database of performance counters in a data center.
- † **Research Assistant** at UC, Riverside. (Jul'08-Mar'12).  
⇒ Worked on different exact methods for **Time Series Motif** discovery ranging from in-core to disk aware to real-time streams. Dissertation thesis comprises of this work.  
⇒ Major data sources include EPG for insects; EEG, EKG and EOG for human; 80-million tiny images; CMU-motion capture database; New college vision data etc.  
⇒ Worked on online and hardware based methods for **Subsequence Search** under time warping with application to Astronomical and Genomic Data. Gained experience on parallel systems such as GPU, Dryad and FPGA.  
⇒ Worked on efficient **Diversification** of XML query results on structural dissimilarities using novel **Seeded Tree Edit Distance** as comparison metric.  
⇒ Worked on finding **expressive** node representation for **Tree Based Classification**

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of time series such as, 3D-accelerometer signals, pen trajectories, etc.

† **Teaching Assistant** at UC, Riverside. (Oct'07-Jun'08).  
⇒Took labs for introductory undergraduate courses.

† **Quantitative Software Developer** at Stochastic Logic Limited, Dhaka, Bangladesh.  
(Nov'06-Aug'07).  
⇒Programed stochastic learning algorithms for predicting financial time series.

## Refereed Publications

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- **“Enumerating Time Series Motifs”**, Abdullah Mueen Under Review.
- **“Clustering Time Series using Unsupervised-Shapelets”**, Jesin Zakaria, Abdullah Mueen, Eamonn Keogh, In the Proceedings of IEEE **ICDM** conference 2012. pp. 785-794.
- **“Diversifying Query Results on Structured Data”**, Mahbub Hasan, Abdullah Mueen, Vassilis Tsotras, Eamonn Keogh, In the Proceedings of IEEE **CIKM** conference 2012. pp. 2099-2103.
- **“Searching and Mining Trillions of Time Series Subsequences under Dynamic Time Warping”**, Thanawin Rakthanmanon, Bilson Campana, Abdullah Mueen, Gustavo Batista, Brandon Westover, Qiang Zhu, Jesin Zakaria, Eamonn Keogh, In the Proceedings of ACM **SIGKDD** conference 2012. pp. 262-270. (**Best research paper award winner**).
- **“Mining Massive Archives of Mice Sounds with Symbolized Representations”**, Jesin Zakaria, Sarah Rotschafer, Abdullah Mueen, Khaleel Abdulrazak, Eamonn Keogh, In the Proceedings of Siam **SDM** conference, 2012. pp. 588-599.
- **“Image Mining of Historical Manuscripts to Establish Provenance”**, Bing Hu, Bilson J. L. Campana, Abdullah Mueen, Eamonn Keogh, In the Proceedings of Siam **SDM** conference, 2012. pp. 804-815.
- **“Experimental comparison of representation methods and distance measures for time series data”**, Xiaoyue Wang, Abdullah Mueen, Hui Ding, Goce Trajcevski, Peter Scheuermann and Eamonn Keogh, Data Mining and Knowledge Discovery (**DMKD**), Springer Netherlands, 2012.
- **“Towards a Universal Dictionary of Intracranial EEG Waveforms”**, M. Brandon Westover, Eamonn Keogh, Abdullah Mueen, Thanawin Rakthanmanon, Qiang Zhu, Sydney S. Cash, The 65th Annual Meeting of the American Epilepsy Society, 2011.
- **“Logical-Shapelets: An Expressive Primitive for Time Series Classification”**, Abdullah Mueen, Eamonn Keogh, Neal Young, In the Proceedings of ACM **SIGKDD** conference 2011. pp. 1154-1162.
- **“Accelerating Dynamic Time Warping Subsequence Search with GPUs and FPGAs”**, Doruk Sart, Abdullah Mueen, Walid Najjar, Vit Niennattrakul, Eamonn Keogh, In the Proceedings of IEEE **ICDM** conference 2010. pp. 1001-1006.
- **“Online Discovery and Maintenance of Time Series Motif”**, Abdullah Mueen, Eamonn Keogh, In the Proceedings of ACM **SIGKDD** conference 2010. pp. 1089-1098.
- **“Fast Approximate Correlation for Massive Time-Series Data”**, Abdullah Mueen, Suman Nath, Jie Liu, In the Proceedings of ACM **SIGMOD** conference 2010. pp. 171-182.

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- **“Finding Time Series Motifs in Disk-Resident Data”**, Abdullah Mueen, Eamonn Keogh, Nima Bigdely-Shamlo, In the Proceedings of IEEE **ICDM** conference 2009. pp. 367-376.
  - **“A Disk-aware Algorithm for Time Series Motif Discovery”**, Abdullah Mueen, Eamonn Keogh, Qiang Zhu, Sydney Cash, Brandon Westover, Nima Bigdely-Shamlo, Data Mining and Knowledge Discovery (**DMKD**), Springer Netherlands, 1(33), 2010.
  - **“Exact Discovery of Time Series Motifs”**, Abdullah Mueen, Eamonn Keogh, Qiang Zhu, Sydney Cash, Brandon Westover, In the Proceedings of Siam **SDM** conference, 2009. pp. 473-484.
  - **“A Heuristic Algorithm for Individual Haplotyping with Minimum Error Correction”**, Abdullah Al Mueen, Md. Shamsuzzoha Bayzid, Md. Maksudul Alam, Md. Saidur Rahman, In the Proceedings of International Conference on BioMedical Engineering and Informatics, 2008. pp. 792-796.

## Patent Applications Filed

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- **“Accelerating Dynamic Time Warping Subsequence Search with GPUs and FPGAs”**, Doruk Sart, Abdullah Mueen, Walid Najjar, Vit Niennattrakul, Eamonn Keogh.
- **“Determining Distance Between Data Sequences”**, Abdullah Mueen, Krishnamurthy Viswanathan, Chetan Gupta.
- **“Similarity Search Initialization”**, Abdullah Mueen, Krishnamurthy Viswanathan, Chetan Gupta.

## Invited Talks

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- **Exact Primitives for Time Series Data Mining**, Yahoo! Labs, Santa Clara, CA, December 2011.
- **Exact Primitives for Time Series Data Mining**, Teradata Corporation, El Segundo, CA, November 2011.
- **Efficient Algorithms for Time Series Motif Discovery**, id:Analytics, San Diego, CA, November 2011.
- **Speeding up Similarity Search for Multidimensional Time Series Data**, HP Labs, Palo Alto, CA, August 2011.
- **Data Mining and Structure Discovery**, CompGSA Symposium, UCR, June 2011.
- **Exact Algorithm for Time Series Motif Discovery**, Discussion Session, CS 235, UCR, May 2011.
- **Accelerating Dynamic Time Warping Subsequence Search with GPUs and FPGAs**, ICDM 2010, Sydney, December 2010.
- **Online Discovery and Maintenance of Time Series Motifs**, SIGKDD 2010, Washington DC, July 2010.
- **Fast Approximate Correlation for Massive Time Series Data**, SIGMOD 2010, Indianapolis, June 2010.

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## Professional Work

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- ⊙ **Journal:** DMKD, KAIS, TKDE.
- ⊙ **Conference:** (PC Member) SIGKDD 2012, SDM 2013, CIKM 2013, ICDM 2013  
BIGDATA 2013.

## Awards and Honors

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- † **Best Research Paper** award in KDD 2012 conference.
- † Runner-up ACM SIGKDD **Doctoral Dissertation Award** 2012.
- † Awarded the **Student Travel Grant** from SIGMOD, SIGKDD and ICDM 2010.
- † Awarded the **Dean's Fellowship** from the Graduate Division at UC Riverside.
- † **Best team** of the website designing contest for the Department of Computer Science & Engineering, BUET.
- † Awarded university **Merit Scholarship** for all the terms at undergraduate level.