Curriculum Vitae

Hanaa M. Hussain

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Education

- B.Sc., Electrical Engineering, California State University, Long Beach, USA, 2000.
- B.Sc., Biomedical and Clinical Engineering, California State University, Long Beach, USA, 2000.
- M. Sc., Bioengineering, Strathclyde University, Glasgow, U.K. 2004.

  (MSc. Title: Medical Imaging)
- PhD, Electronics Engineering, Edinburgh University, U.K. 2012.

  (Thesis Title: Dynamically and Partially Reconfigurable Hardware Architectures for High Performance Microarray Bioinformatics Data Analysis)

Academic experience

- PAAET, Electronics Engineering Technology, Assistant Teacher, 2004 – 2007.
- PAAET, Electronics Engineering Technology, Assistant Professor, 2012 – present, full time.
- Visiting Researcher at Northumbria University, UK, Sep 25, 2017-Aug 31 2018.

Non-academic experience

- 2001-2003 – Electrical Engineer at Kuwait National Petroleum Company, (KNPC), Mina Abdullah Refinery.

Certifications

- Attended various courses and workshops on FPGAs by Xilinx and Altera.
- Attended various self development and time management courses at Edinburgh University.
- Several courses in Electrical Engineering: Uninterruptible Power Supply System (UPS) SDC/PEW, Certified Basic Relay Maintenance Technician (AVO International), Power System Protection (I) and Electrical Power Transformers-Kuwait University
- Certificate of attendance for "Intensive Applied Bioinformatics Course" from Sep 7-8, 2013 in conjunction with the International Conference on Applied Informatics for Health and Life Sciences, Istanbul, Turkey. Awarded Second place winner in course presentation competition.
- International Training Workshop on FPGA Design for Scientific Instrumentation and Computing (11/11/2013 - 22/11/2013), at The Abdus Salam International Centre for Theoretical Physics, ICTP campus, Trieste, Italy.
- Microsoft OpenHack Machine Learning workshop, Feb 11-13, 2019 Kuwait

Current membership

- IEEE Member since 1997.
- IEEE-Society of Engineering in Medicine & Biology (EMBC).
- Kuwait Society of Biomedical Engineering (KCBME).

Honors and awards

Click or tap here to enter text/ none if Not Applicable.

Service activities

- Reviewer for the IEEE EMBS conference since 2013.
- Reviewer for the Pan American Health Care Exchanges **(**PAHCE**)** since 2015.
- Reviewer for the IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI).
- Reviewed Articles for IEEE transactions on Neural Networks.
- Reviewed Articles for IEEE transactions on Very Large Scale Integration (VLSI) Systems.
- Reviewed Articles for IEEE Access.
- Reviewed an article in 2016 for: Transactions on Parallel and Distributed System
- Reviewed an article in 2016 for: Transactions on Reconfigurable Technology and Systems

- Reviewer for the 2016 XIV Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON), Paphos, Cyprus
- Attended "The Cyber Security Symposium", 14th -16th Nov, 2017, Manchester, UK.

Publications and presentations

Conferences

H. Hussain, K. Benkrid, H. Seker, and A. Erdogan, "FPGA Implementation of K-means Algorithm for Bioinformatics Application: An Accelerated Approach to Clustering Microarray Data," in *Proc. of the 2011 NASA/ESA Conf. on Adaptive Hardware and Systems (AHS),*San Diego, CA, USA, June 6-9, 2011, pp.248-255.

H. Hussain, K. Benkrid, H. Seker, and A. Erdogan, "Highly Parametrized K-means Clustering on FPGAs: Comparative Results with GPPs and GPUs," in *Proc.of the 2011 Int. Conf. on Reconfigurable Computing and FPGAs (ReConFig11),*Cancun, Mexico, Nov. 30-Dec. 2, 2011, pp.475–480.

H. Hussain, K. Benkrid, and H. Seker, "An Adaptive Implementation of a Dynamically Reconfigurable K-Nearest Neighbour Classifier on FPGA," in *Proc*. of *the 2012 NASA/ESA Conf. on Adaptive Hardware and Systems (AHS),* Nuremberg, Germany, June 25-28, 2012, pp.205-212.

H. Hussain, K. Benkrid, C. Hong, and H. Seker, "An Adaptive FPGA Implementation of Multi-core K-Nearest Neighbour Ensemble Classifier Using Dynamic Partial Reconfiguration" in *Proc*. of *2012 Int. Conf. on Field Programmable Logic and Applications (FPL12),* Oslo, Norway, Aug 29-31, 2012, pp. 627-630.

H. Hussain, K. Benkrid, and H. Seker, "Reconfiguration-based Implemenation of SVM Classifier on FPGA for Classyfing Microarray Data" in *proc of the 35th Annu. Int. Conf. on the IEEE Engineerng in Medecine and Biology Society,* Osaka, Japan, July 3-7, 2013, pp. 3058-3061.

H. Hussain, K. Benkrid, and H. Seker, "The Role of FPGAs as High Perfomance Computing Solution to Bioinformatics and Computational Biology" in *proc of the Int. Conf. on Applied Informatics for Health and Life Sciences*, Istanbul, Turkey, Sep 9-11, 2013, pp: 102-105.

H. Hussain, K. Benkrid, and H. Seker, "Dynamic Partial Reconfiguration implementation of the SVM/KNN multi-classifier on FPGA for Bioinformatics application" in *proc of the 37th Annu. Int. Conf. on the IEEE Engineerng in Medecine and Biology Society,* Milan, Italy, Aug 25-29, 2015, pp.

Journals

H. Hussain, K. Benkrid, C. Hong, and H. Seker, "Novel Dynamic Partial Reconfiguration Implementation of K-means Clustering on FPGAs: Comparative Results with GPPs and GPUs," *Int. J. of Reconfig. Comput*, 2012.
http://www.hindawi.com/journals/ijrc/2012/135926/

H. Hussain, K. Benkrid, and H. Seker, "Novel dynamic partial reconfiguration implementations of the support vector machines classifier on FPGA", (Accepted) *T. Journal of Electrical Engineering and Computer Science*, September 2014. (DOI: 10.3906/elk-1402-18)

Hong, Chuan; Benkrid, Khaled; Iturbe, Xabier; and **Hussain, Hanaa**, "Efficient Run-Time System Support for High Performance Reliable Reconfigurable Systems", Journal of Computational Intelligence and Electronic Systems,Volume 1, Number 2, December 2012, pp. 213-219 (7).
http://www.ingentaconnect.com/content/asp/jcies/2012/00000001/00000002/art00011?crawler=true

Hussain, Hanaa & Seker, Huseyin & Gorania, Malde, "Bioinformatics Approach to Classification of Four Classes of Organism in Relation to Their Optimal Growth Temperature", International Journal of Pharma Medicine and Biological Sciences, 78-83. 10.18178/ijpmbs.7.4.78-83.

Invited to give Talks at the following Conferences:

- Speaker at the 19th Gulf Engineering forum, Smart Solutions for future cities conference, 7th-9th of February, 2016, talk title " The Impact of Applying Smart Technology to Big Data Mining in Healthcare".
- Presented a talk at the 2nd International Conference on Cloud and Big Data Computing, Aug 4, 2018, Barcelona, Spain. Talk title " Bioinformatics approach to classification of four classes of organism in relation to their optimal growth temperature".
- Speaker at the Medical Accountability and Patient Safety Conference, Kuwait Oct 12, 2019. Talk title "Safety of Medical technologies".

Professional development activities

Volunteering activities

- Member and part of the founding team of Kuwait Safe Medical Devices Initiative, Kuwait society of Engineers (KSE), which promoted safety of medical devices on social media and local health meetings.
- Member in undergraduate certificate verification committee at the Kuwait society of Engineers (KSE), which examines new expat engineers applying to join KSE and work in Kuwait. The objetive of this examination is to verify genuity of undergraduate Biomedical Engineering certificate.

- Member in an ongoing collaborative committee with Saudi Biomed, example of collaboration avtivities is organizing series of online lectures in health engineering topics which hosted speakers from Kuwait and Saudi Arabia.
- Voluntered to provide consultancy services regarding medical devices during Covid-19 pandamic.

Research interests

- Applying machine learning and data mining to Bio-health data, and analysis of Big Bio-health data (current interest).
- Developing FPGA architectures for accelerating data mining and pattern recognition algorithms targeting biomedical applications such as Bioinformatics and Medical Imaging.
- Applying Xilinx Dynamic Partial Reconfiguration (DPR) techniques for server solution as well as for implementing Ensemble methods for Microarray data analysis techniques.
- Develop prediction models for health data.