

## Rami Al-Hmouz

Sultan Qaboos University - Faculty of Engineering-  
Department of Electrical and Computer Engineering

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### Profile Summary

- Teaching:

1- Taught more than 20 courses related to computer engineering (graduate/undergraduate).

- Research:

<https://scholar.google.com/citations?user=kyThJw0AAAAJ&hl=en>

1- Published more than 60 papers in (46 journals, 22 conferences).

2- Participated in more than 15 research projects.

3- H-index =18. Number of citations = 1420.

4- Six papers were published in IEEE Transactions (Cybernetics IF:11, Fuzzy Systems IF: 9.5)

5- Associate editor in

Information Sciences (Elsevier, IF: 6.795)

International Journal of Fuzzy Systems (Springer IF: 4.406)

- Administration:

1- Consultant in quality and academic accreditation deanship at King Abdulaziz University (8 years).

2- Participate in many committees (department): curriculum, undergraduate projects, accreditation (ABET)

### Education

<b>2008</b>	PhD in Engineering (Computer Engineering) University of Technology, Sydney. Sydney-Australia
<b>2003</b>	M.Sc. in Engineering (Computing)-(Course Work) University of Western Sydney. Sydney-Australia
<b>2002</b>	M.Sc in Telecommunication- (Research) University of Jordan. Amman-Jordan
<b>1998</b>	Bachelor of Electrical Engineering/Communication Mutah University. Karak-Jordan

### Work Experience

#### Academic:

- Faculty of Engineering of Sultan Qaboos University (Oman)-Januray 2021-now
- Professor Faculty of Engineering King Abdulaziz University (Saudi Arabia): October/2018-January/2021
- Associate professor Faculty of Engineering King Abdulaziz University (Saudi Arabia): November/2014-October/2018.

- Assistant professor Faculty of Engineering King Abdulaziz University (Saudi Arabia): September /2011-November/2014.
- Assistant professor Faculty of Engineering Isra University (Jordan) March 2008- September 2011.
- Research visitor in the Life Science research at Victoria research laboratory (NICTA Australia) August 2007
- Teacher assistant university of Jordan 1999-2001
- Part-time lecturer university of Jordan 2001-2002.
- Part-time lecturer Al-Khwarzmi College (Jordan) 2001-2002.

#### **Administration**

- Consultant in the Deanship of Quality and Academic Accreditation, King Abdulaziz Univeristy.2014-2021.
- Consultant of Vice President for Development, King Abdulaziz Univesity. 2013-2014.
- Chairman of Electrical and Computer Engineering Department, Isra University (Jordan), October 2010- 2011.

#### **Thesis**

- PhD thesis (Bayesian Data Fusion Approaches for Vehicle Video Analytics).
- Master thesis (Lost call Traffic in circuit switched Network)

#### **Teaching Experience**

- 1-Programming in C++.
- 2-Programming in C#.
- 3-Programming in Java.
- 4-Programming in Matlab.
- 5-Microprosseccor.
- 6-Digital Signal Processing
- 7-Logic Design.
- 8-Advanced Logic circuits.
- 9-Probability and Random Variables.
- 10- Electrical circuits.
- 11-Electronics.
- 12-Signal and Systems.
- 13-Engineering Statistics.
- 14-Computer Organization & Design.
- 16-Computer Networks.
- 17-Digital Image Processing.
- 18- Microcontrollers.
- 19-Disctet Mathematics.
- 20- Advanced Mathematics.
- 21-Special Topics in Computer Engineering
- 22- Soft Computing

#### **Research Interests (key fields)**

1. Granular Computing
2. Fuzzy Modeling.
3. Computer vision and image processing.
4. Machine learning Approaches.

## Award

- Austrian Post Graduate Award APA (UTS).
- Dean Merit list in University of Western Sydney.

## Certificates

- Certificate in Learning Teaching.
- Cisco Certified Network Associate CCNA 640-802.
- Certificate in research commercialization.

## Grants

- (6-4-1432-HiCi). "Human-centric signal analysis and interpretation: a framework of Granular Computing". King Abdulaziz University (400,000 SAR).
- (4-135-1434-HiCi). "System modeling in a distributed and collaborative environment of big data: design methodology and algorithmic developments". King Abdulaziz University. (300,000 SAR).
- (12-INF3105-03). Multimodal Biometric System: A Wavelet and Computational Intelligence Framework . National Science, Technology and Innovation (NSTIP). (1,138,570 SAR).
- (27-135-35-HiCi)Advances in Fuzzy Linguistic Modelling: Applications in Group Decision Making and Recommender System. (300,000 SAR)
- (277-135-1434). "Models of Time Series with Time Granulation". King Abdulaziz University (66,000 SAR).
- (314-135-1434). "Description and prediction of time series- a framework of Granular Computing ". King Abdulaziz University (58,000 SAR).
- (8-135-36-RG). Linguistic Data Description and Analysis in Non-Stationary and Dynamic Environments: A Framework of Granular Computing. (130,000 SAR).
- (135-689 -D1435). Incremental Hierarchical system Modelling. (50,000 SAR).
- (135-804-D1435). Granular classifiers and their design through refinement of information granules (10,000 SAR)
- (362-135-1437). Automatic Recognition of Artistic Arabic Calligraphy Types. (37,800 SAR).
- (KEP-5-135-39) Granular autoencoders in data representation, compression, and preprocessing (80,000)
- (KEP-7-135-39) New fuzzy consensus models for group decision making. (80,000 SAR)

## Memberships

- IEEE senior member #93038644
- Jordan Engineers Association #10255

## Research Experience

Associate Editor:

Information Sciences. Elsevier

International Journal of Fuzzy Systems. Springer.

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## Journal Papers

1. Mohammad Khan, Rajesh Gazara, Muaffaq Nofal, Sohom Chakrabarty, Elham Dannoun, Rami Al-Hmouz, M Mursaleen, Reinforcing synthetic data for meticulous survival prediction of patients suffering from left ventricular systolic dysfunction, Accepted: *IEEE Access*, 2021
2. Juan Antonio Morente-Molinera, Yinglin Wang, Zai-Wu Gong, Ali Morfeq, Rami Al-Hmouz, Enrique Herrera-Viedma, Reducing criteria values in multi-criteria group decision making methods using hierarchical clustering methods and fuzzy ontologies , *IEEE Fuzzy Systems*, 2021.
3. R Al-Hmouz, W Pedrycz, A Balamash, A Morfeq, Logic-oriented autoencoders and granular logic autoencoders: Developing interpretable data representation, *IEEE Transactions on Fuzzy Systems*. 2020.
4. Hamdan Al-Harbi, Rami Al-Hmouz, Information fusion in recognition of Saudi Arabia license plates, *WSEAS Transaction on Systems and Control*, 15, 2020.
5. MF Khan, SK Spurgeon, XG Yan, MM Nofal, R Al-Hmouz, Inbuilt tendency of the eIF2 regulatory system to counteract uncertainties, *EEE Transactions on NanoBioscience*. 20 (1), 35-41,2020.
6. Abdullah Balamash, Witold Pedrycz, Rami Al-Hmouz, Ali Morfeq, Data Description through Information Granules: A Multiview Perspective. *International journal of fuzzy systems*. 22 (6), 1731-1747, 2020.
7. FJ Cabrerizo, R Al-Hmouz, A Morfeq, MÁ Martínez, W Pedrycz, Enrique Herrera-Viedma, Estimating incomplete information in group decision making: A framework of granular computing, *Applied Soft Computing*. 86, 105930, 2020.
8. Rami Al-Hmouz, Deep learning autoencoder approach: Automatic recognition of artistic Arabic calligraphy types, *Kuwait J. Sci.* 47 (3) pp. 2-13, 2020.
9. A Al-Hmouz, G Latif, J Alghazo, R Al-Hmouz, Enhanced Numeral Recognition for Handwritten Multi-language Numerals Using Fuzzy Set-Based Decision Mechanism, *International Journal of Machine Learning and Computing*, 10 (1), 2020.
10. M. F. Khan, D. Goyal, M. M. Nofal, E. Khan, R. Al-Hmouz and E. H. Viedma, Fuzzy-based Histogram Partitioning for Bi-Histogram Equalisation of Low Contrast Images, *IEEE Access*, 8, 11595-11614, 2020.
11. JA Morente-Molinera, X Wu, A Morfeq, R Al-Hmouz, E Herrera-Viedma, A novel multi-criteria group decision-making method for heterogeneous and dynamic contexts using multi-granular fuzzy linguistic modelling and consensus measures, *Information Fusion*, 53, 240-250, 2020.
12. R Al-Hmouz, W Pedrycz, A Balamash, A Morfiq, Logic-driven autoencoders, *Knowledge-Based Systems*, 183, 104874, 2019.

13. Witold Pedrycz, Rami Al-Hmouz, Abdullah Balamash, Ali Morfeq, Granular autoencoders: concepts and design, *Soft Computing*, 23 (2), 407-418 (2019).
14. Rami Al-Hmouz, Witold Pedrycz, Khaled Daqrouq, Ali Morfeq, Ahmed Al-Hmouz, Quantifying dynamic time warping distance using probabilistic model in verification of dynamic signatures, *Soft Computing*, 23, 2,407-418, 2019.
15. Abdullah Balamash, Witold Pedrycz, Rami Al-Hmouz, Ali Morfeq, Perspective-oriented data analysis through the development of information granules of order 2, *International Journal of Approximate Reasoning*, 85, pp: 97-106 , 2017 .
16. Rami Al-Hmouz , Witold Pedrycz, Khaled Daqrouq, Ali Morfeq, Development of Multimodal Biometric Systems with Three-Way and Fuzzy Set-Based Decision Mechanisms . *International Journal of Fuzzy Systems*. 20 (1), 128-140, 2018.
17. R. Al-Hmouz; W. Pedrycz; A. Balamash; A. Morfeq, Hierarchical System Modeling, in *IEEE Transactions on Fuzzy Systems* , 26 (1), 258-269, 2018.
18. Taylan, Osmana; Zytoon, Mohamed; Morfeq, Ali; Al-Hmouz, Rami; Herrera-Viedma, Enrique, Workplace assessment by fuzzy decision tree and TOPSIS methodologies to manage the occupational safety and health performance, *Journal of Intelligent & Fuzzy Systems*, vol. 33, no. 2, pp. 1209-1224, 2017.
19. Siraj Allaf, Rami Al-Hmouz, Automatic Recognition of Artistic Arabic Calligraphy, *JKAU: Eng. Sci.*, Vol. 27 No.1, pp: 3 – 17, 2016.
20. Rami Al-Hmouz, Witold Pedrycz, Abdullah Saeed Balamash, Ali Morfeq, Granular description of data in a non-stationary environment, *Soft Computing*, 1-13, 2016.
21. Rami Al-Hmouz, Witold Pedrycz. Models of time series with time granulation. *Knowledge and Information Systems*, 48(3), 561-580, 2016.
22. J.A. Morente-Molinera, R. Al-Hmouz, A. Morfeq, A.S. Balamash, E. Herrera-Viedma , A Decision Support System for Decision Making in Changeable and Multi-Granular Fuzzy Linguistic Contexts, *J. of Mult.-Valued Logic & Soft Computing*, 26, 485–514, 2016.
23. Witold Pedrycz., Rami Al-Hmouz, Abdullah Balamash, Ali Morfeq, Hierarchical Granular Clustering, Modeling with linguistic entities and linguistic descriptors: a perspective of granular computing. *Soft Computing*, 1-13, 2015.
24. Abdullah Balamash, Witold Pedrycz, Rami Al-Hmouz, Ali Morfeq Granular classifiers and their design through refinement of information granules. *Soft Computing*. 1-15, 2015.
25. \*F. J. Cabrerizo, R. Al-Hmouz, A. Morfeq, A. S. Balamash, M. A. Martínez, E. Herrera-Viedma, Soft consensus measures in group decision making using unbalanced fuzzy linguistic information. *Soft Computing*, 1-14, 2015.
26. \*Francisco Javier Cabrerizo, Francisco Chiclana, Rami Al-Hmouz, Ali Morfeq, Abdullah Saeed Balamash and Enrique Herrera-Viedma, Fuzzy decision making and consensus: challenges, *Journal of Intelligent & Fuzzy Systems*, 29(3), 1109-1118, 2015.
27. Khaled Daqrouq, Rami Al-Hmouz, Abdullah Saeed Balamash, Naif Alotaibi, and Elmar Noeth, An Investigation of Wavelet Average Framing LPC for Noisy Speaker Identification Environment, *Mathematical Problems in Engineering*, vol. 2015, 10 pages, 2015.
28. Witold Pedrycz, Rami Al-Hmouz, Abdullah Balamash, Ali Morfeq, Hierarchical Granular Clustering: An Emergence of Information Granules of Higher Type and Higher Order, *IEEE Transactions on Fuzzy Systems*, 23(6), 2270-2283, 2015.
29. Khaled Daqrouq, Rami Alhmouz, Ahmed Balamesh, Adnan Memic, Application of Wavelet Transform for PDZ Domain Classification, *Plos one*,10(4), 2015.

30. Witold Pedrycz, Rami Al-Hmouz, Abdullah Saeed Balamash, Ali Morfeq, Designing granular fuzzy models: A hierarchical approach to fuzzy modeling, *Knowledge-Based Systems*, 76, 42-52, 2015.
31. Rami Al-Hmouz, Witold Pedrycz, Abdullah Balamash, Description and prediction of time series: A general framework of Granular Computing, *Expert Systems with Applications*, 42 (10), 4830-4839, 2015.
32. Witold Pedrycz, Rami Al-Hmouz, Ali Morfeq, Abdullah Saeed Balamash, Distributed proximity-based granular clustering: towards a development of global structural relationships in data. *Soft Computing*, 19(10), 2751-2767, 2015.
33. Rami Al-Hmouz, Witold Pedrycz, Abdullah Balamash, Ali Morfeq, Description and classification of granular time series, *Soft Computing*, 19(4), 1003-1017, 2015.
34. Abdullah Balamash, Witold Pedrycz, Rami Al-Hmouz, Ali Morfeq, An expansion of fuzzy information granules through successive refinements of their information content and their use to system modeling, *Expert Systems with Applications*, Volume 42(6), 2985-2997, 2015.
35. Maen Takruri, R Al-Hmouz, A Al-Hmouz, M Momani, Fuzzy C Means Based Hybrid Classifiers For Offline Recognition Of Handwritten Indian (Arabic) Numerals, *International Journal of Applied Engineering Research*, 10 (1), 1911-1924, 2015.
36. Mohammad Momani, Maen Takruri, Rami Al-Hmouz, Risk Assessment Algorithm in Wireless Sensor Networks using Beta Distribution. *International Journal of Computer Networks. JCNC*, 6(5), 2014.
37. Rami Al-Hmouz, Khalid Aboura, License plate localization using a statistical analysis of Discrete Fourier Transform signal, *Computers & Electrical Engineering*, 40(3), 982-992, 2014.
38. Hasan Bjaili, Khalid Daqrouq and Rami Al-Hmouz, Speaker Identification Using Bayesian Algorithm. *Trends in Applied Sciences Research*, 9, 472-479, 2014.
39. Alaa M. Alturki, Abdulaziz M. Al-Ghamdi, Khaled Daqrouq and Rami Al-Hmouz, Application of ECG Arrhythmia Classification by Means of Bayesian Theorem, *Journal of Applied Sciences*, 14, 165-170, 2014.
40. Rami Al-Hmouz, Mohammed Momani, Maen Takruri, Trust and Reputation Analysis in Fading Wireless Sensor Network Channel, *Life Science Journal*, 10(4). 310-318, 2013.
41. Witold Pedrycz, Rami Al-Hmouz, Ali Morfeq, Abdullah Saeed Balamash, Building granular fuzzy decision support systems, *Knowledge.-Based Syst*, 58, 3-10, 2014.
42. Witold Pedrycz, Rami Al-Hmouz, Ali Morfeq, Abdullah Balamash, The Design of Free Structure Granular Mappings: The Use of the Principle of Justifiable Granularity, *IEEE T. Cybernetics*, 43(6), 2105-2113, 2013.
43. Rami Al-Hmouz , 2012. OCR Based Pixel Fusion. *Journal of Applied Sciences*, 12, 2319-2325, 2012.
44. Ahmed Al-Hmouz, Jun Shen, Rami Al-Hmouz, Jun Yan, "Modelling and Simulation of an Adaptive Neuro-Fuzzy Inference System (ANFIS) for Mobile Learning, *IEEE Transactions on Learning Technologies*, 5(3), 226-237, 2012.
45. Mohammad Momani, Subhash Challa, Rami Al-Hmouz, Bayesian Fusion Algorithm for Inferring Trust in Wireless Sensor Networks. *Journal Networks* 5(7), 815-822, 2010.
46. Rami Al-Hmouz, Subhash Challa, License Plate Localization Based on a Probabilistic Model . *Machine Vision and Applications*, 21, 319-330 , 2010.

### **Conference Papers**

1. Ahmed Qasem, Anas Aljahdali, Muath Alyopy, Muhammad Bilal, Shehzad Hanif, Rami Alhmouz, Information Broadcast using Visible Light Communication (VLC), *The Second international Engineering Conference and exhibition*. Riyadh, 2-5 March, 2020.

2. Rami Al-Hmouz, Khaled Darouq, Ali Morfeq, Witold Pedrycz, Multimodal biometrics using multiple feature representations to speaker identification system, *Information and Communication Technology Research (ICTRC), 2015 International Conference*, pp.314-317, 17-19 May, 2015.
3. Rami Al-Hmouz, Khalid Aboura, Image Analysis Algorithms for Recognition Systems. *The 26th International Conference on Systems Research, Informatics and Cybernetics*, Baden-Baden, Germany; 08/2014
4. Rami Al-Hmouz, Witold Pedrycz, Abdullah Saeed Balamash, Ali Morfeq, From data to granular data and granular classifiers. *FUZZ-IEEE*, 432-438, 2014.
5. Maen Takruri,,Rami Al-Hmouz, Ahmed Al-Hmouz, A Three-level classifier: Fuzzy C Means, Support Vector Machine and Unique Pixels for Arabic Handwritten Digits, *Proceeding International Conference on Computer Vision and Image Analysis applications (ICCVIA' 2014)* , Ras Al Khaimah, UAE. 25-27 March, 2014.
6. Rami Al-Hmouz, Witold Pedrycz, Abdullah Balamash , and Ali Morfeq, Granular Representation Schemes of Time Series: A Study in an Optimal Allocation of Information Granularity, *Proceeding IEEE Symposium Series on Computational Intelligence 2013, FOCI 2013*, 44-51,Singapore, 16-19 April 2013.
7. Rami Al-Hmouz, Jaffar Alghazo, Ahmad Al-Hmouz, *OCR based Fuzzy logic*, The 2011 International Conference on High Performance Computing & Simulation (HPCS 2011), Istanbul, Turkey, 4 – 8 July, 2011.
8. A. Al-Hmouz, J. Shen, J. Yan, R. Al-Hmouz, Modelling Mobile Learning System Using ANFIS, *The 11th IEEE International Conference on Advanced Learning Technologies (ICALT 2011)*, Athens, Georgia, USA. 2011
9. A. Al-Hmouz, J. Shen, J. Yan, R. Al-Hmouz, Enhanced Learner Model for Adaptive Mobile Learning, *The 12th International Conference on Information Integration and Web-based Applications & Services (iiWAS2010)*, Paris, France, ACM, pp. 781-784, 2010.
10. Mohammad Momani, Subhash Challa, Rami Alhmouz, BNWSN: Bayesian Network Trust Model for Wireless Sensor Networks, *Mosharaka International Conference on Communications, Computers and Applications*, 8-10 August 2008,
11. M. Momani, S. Challa, and R. Alhmouz, Can we Trust Trusted Nodes in Wireless Sensor Networks?, *The International Conference on Computer and Communication Engineering (ICCCE 08)*, Kuala Lumpur, Malaysia,. pp. 1227 – 1232, 2008.
12. Rami Al-Hmouz, Subhash Challa, Duc Vo, Probabilistic Modeling and Fusion for Image Feature Extraction with Applications to License Plate Recognition. *In proceedings of the International Conference on Computer Vision Theory and Applications (VISAPP 2007)*, Barcelona, Spain, 8 - 11 March, 2007
13. Rami Al-Hmouz, Subhash Challa. Intelligent Stolen Vehicle Detection using Video Sensing, *IDC*, Adelaide. Australia, 12-14 February, 2007.
14. M. Momani, J. Agbinya, R. Alhmouz, G. P. Navarrete, and M. Akache, A New Framework of Establishing Trust in Wireless Sensor Networks, *Proc. of the International Conference on Computer & Communication Engineering, (ICCCE '06)*, Kuala Lumpur, Malaysia, 2006.
15. Rami Al-Hmouz, Subhash Challa, Optimal Placement for Opportunistic Cameras Using Genetic Algorithm. *The 2nd International Conference on Intelligent Sensors, Sensor Networks and Information Processing*, 5-8 December, 2005.
16. Rami Al-Hmouz, Tauseef Gulrez, Adel Al-Jumaily, Cellular Automata Based Path-Planning Algorithm for Autonomous Mobile Robots, *16th IFAC World Congress*, Prague, Czech Republic, 4-8 July, 2005.

17. Tauseef Gulrez, Rami Al-Hmouz, Adel Al-Jumaily, Zenon Chaczko, CA based PRM for Autonomous Mobile Robot's Path-Planning in Cluttered Environment. *ICMSAO '05 First International Conference on Modeling, Simulation and Applied Optimization*. Sharjah, United Arab Emirates, 1-3 February, 2005.
18. Tauseef Gulrez, Rami Al-Hmouz, Adel Al-Jumaily, Mission-Planning of Autonomous Mobile Robot in Cluttered Environmen, *The 2<sup>nd</sup> International Conference on Mechatronics 2005 (ICOM'05)*, Malaysia, 10-12 May, 2005
19. Tauseef Gulrez, Rami Al-Hmouz, Zenon Chaczko, Unmanned Autonomous Vehicle Control & SLAM Problem in 2-D environment, *The INMIC2004 Conference that will be organized at National University of Computer and Emerging Sciences*, Lahore, Pakistan, 24-26 December, 2004.
20. Rami Al-Hmouz, Tauseef Gulrez, Adel-Al-Jumaily, Probabilistic Road Maps with Obstacle Avoidance in Cluttered Dynamic Environment, *The International Conference on Intelligent Sensors, Sensor Networks and Information Processing – 2004 (ISSNIP 2004)*, Melbourne, Australia, 14-17 December, 2004.
21. Zenon Chaczko, Tauseef Gulrez, Rami Alhmouz, Robin Braun, Modelling a Holonic Network System using Cellular Automata for Detecting Traffic Congestion. *The 3rd Workshop on the Internet, Telecommunications and Signal Processing WITSP'2004*. Adelaide, 20-22 December, 2004.
22. Rami Hmous, Jamil Ayoub, Lost Call Traffic in Circuit Switched Networks. *ACS/IEEE International Conference on Computer Systems and Applications*, Tunis, Tunisia, July, 2003.