MOHAMMAD I. DAOUD

Department of Computer Engineering German Jordanian University Amman, Jordan $+962\ 795934911 \\mohammad.aldaoud@gju.edu.jo$

CURRENT OCCUPATION

Professor	Oct. $2020 - Present$
Associate Professor	Oct. 2016 - Oct. 2020
Assistant Professor	Sept. $2011 - Oct. 2016$
Department of Computer Engineering	
School of Electrical Engineering and Information Technology	
German Jordanian University, Amman, Jordan	
Adjunct Associate Professor	2015 - Present
Hardware Verification Group	
http://hvg.ece.concordia.ca/people	
Concordia University, Montreal, Canada	
EDUCATION AND TRAINING	
Postdoctoral Research Fellow and Lecturer	2010 - 2011
Department of Electrical and Computer Engineering	
The University of British Columbia. Vancouver. BC. Canada	
Advisors: Prof. Septimiu Salcudean, Prof. Purang Abolmaesumi, and	
Prof. Robert Rohling	
Research focus: Ultrasound signal and image analysis, machine learning,	
parallel computing, and ultrasound-guided needle interventions	
Doctor of Philosophy	2005 - 2009
Department of Electrical and Computer Engineering	
The University of Western Ontario, London, ON, Canada	
Advisor: Dr. James Lacefield	
Research focus: Parallel three-dimensional simulation, ultrasound imag-	
ing, and ultrasound image analysis	
GPA: 93.4%	
Master of Applied Science	2003 - 2005
Department of Electrical and Computer Engineering	
Concordia University, Montreal, QC, Canada	
Advisor: Dr. Nawwaf Kharma	
Research focus: Task scheduling algorithms for distributed computing	
systems, scheduling heuristics, and evolutionary computation	
GPA: 3.8	

FELLOWSHIPS AND AWARDS

Avempace III Scholarship Scheme for Academic Exchange, Erasmus Mundus Partnerships, European Commission, September–October 2014 (Level: International), Host University: Bonn-Rhine-Sieg University of Applied Sciences, Germany.

Postdoctoral Fellowship (PDF), Natural Sciences and Engineering Research Council of Canada (NSERC), 2010–2011 (Level: National– prestigious fellowship offered by Canada's federal government to the most promising postdoctoral research fellows, Value: CND\$40,000/yr).

Postgraduate Scholarship – Doctorate, Natural Sciences and Engineering Research Council of Canada (NSERC), 2007–2009 (Level: National – prestigious scholarship offered by Canada's federal government to the most promising doctoral students, Value: CND\$21,000/yr).

Western Engineering Scholarship, The University of Western Ontario, London, ON, Canada, 2005–2009, (Level: Institutional, Value: CND\$8,500 for 2005–2006, CND\$4,500 for 2006–2007, CND\$9,685 for 2007–2008, CND\$9,906 for 2008–2009).

Strategic Training Program in Cancer Research and Technology Transfer, Canadian Institutes of Health Research (CIHR) and University of Western Ontario, 2006–2008 (Level: Institutional, Value: CND\$23,600/yr).

Ontario Graduate Scholarship (OGS) – declined, Ontario Ministry of Training, Colleges and Universities, 2007–2008 (Level: Provincial, Value: CND\$15,000/yr).

Outstanding Presentation in Graduate Symposium 2007, Department of Electrical and Computer Engineering, The University of Western Ontario, London, ON, Canada, 2007.

RESEARCH INTERESTS

Machine and deep learning, medical image and signal analysis, image-guided needle interventions, data mining, parallel processing, evolutionary computation, and software development

PEER-REVIEWED FUNDING

A Deep Learning Approach for Breast Cancer Diagnosis using Ultrasound Imaging

Investigators: M.I. Daoud and M. Al-Najar Source and Program: Seed Grant Program, German Jordanian University, Jordan Amount: 64,800 USD Period: 2020–2023

A Data Mining Approach for Localizing the Needle in Ultrasound Images based on Ultrasound Radio-Frequency and Doppler Signals

Investigators: M.I. Daoud and A. Zayadeen Source and Program: Scientific Research Support Fund–Jordan Amount: 126,800 USD Period: 2017–2020

Three-Dimensional Ultrasound Imaging using Virtual Reality Sensing Technology

Investigators: M.I. Daoud, R. Alazrai, and M. Al-Najar Source and Program: Seed Grant Program, German Jordanian University, Jordan Amount: 42,300 USD Period: 2018–2020

JOVITAL – Jordan Opportunity for Virtual Innovative Teaching and Learning

Principal Investigator: E. Schoop (Technische Universität Dresden (TUD), Dresden, Germany)

German Jordanian University Co-Investigators: M.I. Daoud, S. Alouneh, R. Alazrai, and F. Al-Hawari Partners: The project involves nine universities and associations from Jordan, Germany, United Kingdom, Italy, and Slovenia

Source and Program: Erasmus+ programme - Key Action 2 - Capacity Building in the Field of Higher Education, European Commission

Amount: 999,901 Euro (total budget) - 82,646 Euro (GJU share)

Period: 2017-2020

A Bottom-up Approach for Opening up Education in South-Mediterranean Countries (Open-MEd)

Principal Investigator: M. Scalisi (UNIMED - the Mediterranean Universities Union, Rome, Italy)

German Jordanian University Co-Investigators: M. Daoud, S. Al-Agtash, L. Salhieh, R. Sabri, and S. Alouneh

Partners: The project involves fifteen universities and associations from Italy, United Kingdom, Spain, Jordan, Palestine, Morocco, and Egypt

Source and Program: Erasmus+ programme - Key Action 2 - Capacity Building in the Field of Higher Education, European Commission

Amount: 871,229 Euro (total budget) - 65,528 Euro (GJU share)

Period: 2015-2018

Accurate Needle Localization and Visualization for Ultrasound-Guided Interventions Investigators: M.I. Daoud, O. Ait Mohamed, D.A. Al-Nadi, and O. Samara

Source and Program: Seed Grant Program, German Jordanian University, Jordan Amount: 42,300 USD

Period: 2015–2017

Three-dimensional Ultrasound Image Analysis System for Accurate Breast Cancer Detection Investigators: M.I. Daoud and M.S. Al-Najar

Source and Program: Scientific Research Support Fund–Jordan (~74,000 USD) AND Complementary Grant, German Jordanian University, Jordan (~11,300 USD) Amount: 85,300 USD Period: 2014–2017

New Horizons Biomedical Informatics Observatories in Mediterranean Region (BIOMed)

Principal Investigator: J. Mantas (National and Kapodistrian University of Athens, Athens, Greece) German Jordanian University Co-Investigators: M. Daoud and S. Alouneh Partners: The project involved five universities from Greece, Spain, Turkey, Jordan, and Egypt Source and Program: FP7-PEOPLE-2012-IRSES - Funding scheme: Marie Curie Actions International

Research Staff Exchange Scheme (IRSES), European Commission

Amount: 328,700.00 Euro (total budget)

GJU Funding Period: 2015–2017

Partnership with Enterprises Towards Building Open Source Software Communities and Rejuvenation of Technical Education and Innovation (OSSCOM)

Principal Investigator: H. Rainer (Hochschule Bonn-Rhein-Sieg University of Applied Sciences, Germany) German Jordanian University Co-Investigators: S. Al-Agtash, M. Daoud, S. Alouneh, and D. Abusaymeh Partners: The project involved ten universities and companies from Germany, Spain, United Kingdom, Jordan, and Lebanon

Source and Program: Trans-European Mobility Programme for University Studies (TEMPUS), European Commission

Amount: 966,162.92 Euro (total budget)

Period: 2014–2017

PUBLICATIONS AND CONTRIBUTIONS

Refereed Journal Papers

[1] H. Abdel-Nabi, M. Ali, A. Awajan, R. Alazrai, **M. I. Daoud**, and P. Suganthan, "IcTHSadpDE: Iterative cyclic tri-strategy hybrid stochastic fractal with adaptive DE algorithm," *Information Sciences*, In Press - accepted in January 2023 (Impact Factor: 6.795).

[2] H. Abdel-Nabi, M. Ali, A. Awajan, **M. Daoud**, R. Alazrai, P.N. Suganthan, and T. Ali, "A comprehensive review of the deep learning-based tumor analysis approaches in histopathological images: segmentation, classification and multi-learning tasks," *Cluster Computing*, 41 pages, 2023 (Impact Factor: 2.303).

[3] **M. I. Daoud**, A. Al-Ali, R. Alazrai, M. S. Al-Najar, B. A. Alsaify, M. Z. Ali and S. Alouneh, "An edgebased selection method for improving regions-of-interest localizations obtained using multiple deep learning object-detection models in breast ultrasound images," *Sensors*, vol. 22, Article 6721, 22 pages, 2022 (Impact Factor: 3.847).

[4] M. I. Daoud, A. F. Abu-Hani, A. Shtaiyat, M. Z. Ali, R. Alazrai, "Needle detection using ultrasound B-mode and power Doppler analyses," *Medical Physics*, vol. 49, pp. 4999–5013, 2022 (Impact Factor: 4.071).

[5] R. Alazrai, M. Abuhijleh, M. Z. Ali, **M. I. Daoud**, "A deep learning approach for decoding visually imagined digits and letters using time-frequency-spatial representation of EEG signals," *Expert Systems with Applications*, vol. 203, Article 117417, 17 pages, 2022 (Impact Factor: 6.954).

[6] B. A. Alsaify, M. M. Almazari, R. Alazrai, S. Alouneh, **M. I. Daoud**, "A CSI-based multi-environment human activity recognition framework," *Applied Sciences*, vol. 12, Article 930, 29 pages, 2022 (Impact Factor: 2.679).

[7] R. S. Al-Gharaibeh, M. Z. Ali, **M. I. Daoud**, R. Alazrai, H. Abdel-Nabi, S. Hriez, P. N. Suganthan, "Real-parameter constrained optimization using enhanced quality-based cultural algorithm with novel influence and selection schemes," *Information Sciences*, vol. 576, pp. 242–273, 2021 (Impact Factor: 6.795).

[8] F. Al-Hawari, H. Barham, O. Al-Sawaeer, M. Alshawabkeh, S. Alouneh, M. I. Daoud, R. Alazrai, "Methods to achieve effective web-based learning management modules: MyGJU versus Moodle," *PeerJ Computer Science*, vol. 7, Article e498, 34 pages, 2021 (Impact Factor: 1.39).

[9] B. A. Alsaify, M. M. Almazari, R. Alazrai, **M. I. Daoud**, "A dataset for Wi-Fi-based human activity recognition in line-of-sight and non-line-of-sight indoor environments," *Data in Brief - Elsevier*, vol. 33, Article 106534, 9 pages, 2020 (Indexed in Scopus).

[10] M. I. Daoud, S. Abdel-Rahman, T. M. Bdair, M. S. Al-Najar, F. H. Al-Hawari, and R. Alazrai, "Breast tumor classification in ultrasound images using combined deep and handcrafted features," *Sensors*, vol. 20, Article 6838, 20 pages, 2020 (Impact Factor: 3.847).

[11] **M. I. Daoud**, A. F. Abu-Hani, and R. Alazrai, "Reliable and accurate needle localization in curvilinear ultrasound images using signature-based analysis of ultrasound beamformed radio frequency signals," *Medical Physics*, vol. 47, pp. 2356–2379, 2020 (Impact Factor: 3.177).

[12] **M. I. Daoud**, A. Alhusseini, M. Z. Ali, and R. Alazrai, "A game-based rehabilitation system for upper-limb cerebral palsy: A feasibility study," *Sensors*, vol. 20, Article 2416, 24 pages, 2020 (Impact Factor: 3.847).

[13] R. Alazrai, A. Awad, B. A. Alsaify, M. Hababeh, and M. I. Daoud, "A dataset for Wi-Fi-based human-to-human interaction recognition," *Data in Brief - Elsevier*, vol. 31, Article 105668, 12 pages, 2020 (Indexed in Scopus).

[14] R. Alazrai, M. Hababeh, B. A. Alsaif, M. Z. Ali, and **M. I. Daoud**, "An end-to-end deep learning framework for recognizing human-to-human interactions using Wi-Fi signals," *IEEE Access*, vol. 8, pp. 197695–197710, 2020 (Impact Factor: 4.098).

[15] R. Alazrai, A. Al-Saqqaf, F. Al-Hawari, H. Alwann, and **M. I. Daoud**, "A time-frequency distributionbased approach for decoding visually imagined objects using EEG signals," *IEEE Access*, vol. 8, pp. 138955– 138972, 2020 (Impact Factor: 4.098). [16] R. Cachia, **M. Daoud**, A. M. Eldeib, O. Hiari, A. Tweissi, D. Villar-Onrubia, K. Wimpenny, and I. M. Jariego, "Cultural diversity in the adoption of open education in the Mediterranean basin: collectivist values and power distance in the universities of the Middle East," *Araucaria*, vol. 22, pp. 53–82, 2020.

[17] R. Alazrai, M. Abuhijleh, H. Alwanni, and M. I. Daoud, "A deep learning framework for decoding motor imagery tasks of the same hand using EEG signals," *IEEE Access*, vol. 7, pp. 109612–109627, 2019 (Impact Factor: 4.098).

[18] R. Alazrai, S. Al-Rawi, H. Alwanni, and **M. I. Daoud**, "Tonic cold pain detection using Choi–Williams time-frequency distribution analysis of EEG signals: a feasibility study," *Applied Sciences*, vol. 9, Article 3433, 17 pages, 2019 (Impact Factor: 2.217).

[19] **M. I. Daoud**, A. A. Atallah, F. Awwad, M. Al-Najjar, and R. Alazrai, "Automatic superpixel-based segmentation method for breast ultrasound images," *Expert Systems With Applications*, vol. 121, pp. 78–96, 2019 (Impact Factor: 4.292).

[20] R. Alazrai, H. Alwanni, and M. I. Daoud, "EEG-based BCI system for decoding finger movements within the same hand," *Neuroscience Letters*, vol. 698, pp. 113–120, 2019 (Impact Factor: 2.173).

[21] M. I. Daoud, A.-L. Alshalalfah, O. Ait Mohamed, and R. Alazrai, "A hybrid camera- and ultrasoundbased approach for needle localization and tracking using a 3D motorized curvilinear ultrasound probe," *Medical Image Analysis*, vol. 50, pp. 145–166, 2018 (Impact Factor: 8.880).

[22] M. I. Daoud, A. Shtaiyat, A. R. Zayadeen, and R. Alazrai, "Accurate needle localization using twodimensional power Doppler and B-mode ultrasound image analyses: A feasibility study," *Sensors*, vol. 18, Article ID 3475, 23 pages, 2018 (Impact Factor: 3.847).

[23] R. Alazrai, R. Homoud, H. Alwanni, and M. I. Daoud, "EEG-Based Emotion Recognition Using Quadratic Time-Frequency Distribution," *Sensors*, vol. 18, Article 2739, 32 pages, 2018 (Impact Factor: 3.847).

[24] S. Bayat, S. Azizi, M. I. Daoud, G. Nir, F. Imani, C.D. Gerardo, P. Yan, A. Tahmasebi, F. Vignon, S. Sojoudi, S. Wilson, K.A. Iczkowski, M.S. Lucia, L. Goldenberg, S.E. Salcudean, P. Abolmaesumi, and P. Mousavi, "Investigation of physical phenomena underlying temporal enhanced ultrasound as a new diagnostic imaging technique: Theory and simulations," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 65, pp. 400–410, 2018 (Impact Factor: 2.989).

[25] R. Alazrai, M. Momani, H. Abu Khudair, and **M. I. Daoud**, "EEG-based tonic cold pain recognition system using wavelet transform," *Neural Computing and Applications - Springer*, 14 pages, In Press (Impact Factor: 4.664).

[26] R. Alazrai, H. Alwanni, Y. Baslan, N. Alnuman, and M. I. Daoud, "EEG-based brain-computer interface for decoding motor imagery tasks within the same hand using Choi-Williams time-frequency distribution," *Sensors*, vol. 17, Article 1937, 28 pages, 2017 (Impact Factor: 3.847).

[27] R. Alazrai, M. Momani, and M. I. Daoud, "Fall detection for elderly from partially observed depthmap video sequences based on view-invariant human activity representation," *Applied Sciences*, vol. 7, Article 316, 19 pages, 2017 (Impact Factor: 2.217).

[28] M. I. Daoud, T. Bdair, M. Al-Najar, and R. Alazrai, "A Fusion-based approach for breast ultrasound image classification using multiple-ROI texture and morphological analyses," *Computational and Mathematical Methods in Medicine*, vol. 2016, Article ID 6740956, 12 pages (Impact Factor: 1.563).

[29] **M. I. Daoud**, R. N. Rohling, S. E. Salcudean, and P. Abolmaesumi "Needle detection in curvilinear ultrasound images based on the reflection pattern of circular ultrasound waves," *Medical Physics*, vol. 42(11), pp. 6221–6233, 2015 (Impact Factor: 3.177).

[30] M. I. Daoud, A.-L. Alshalalfah, F. Awwad, and M. Al-Najar "A freehand 3D ultrasound imaging system using open-source software tools with improved edge-preserving interpolation," *International Journal of Open Source Software and Processes*, vol. 5(3), pp. 39–57, 2014.

[31] **M. I. Daoud**, P. Mousavi, F. Imani, R. Rohling, and P. Abolmaesumi, "Tissue classification using ultrasound-induced variations in acoustic backscattering features," *IEEE Trans. Biomed. Eng.*, vol. 60(2), pp. 310–320, 2013 (Impact Factor: 4.491).

[32] M. I. Daoud and N. Kharma, "A hybrid heuristic-genetic algorithm for task scheduling in heterogeneous processor networks," *J. Parallel Distrib. Comput.*, vol. 71(11), pp. 1518–1531, 2011 (Impact Factor: 0.859, 5-Year Impact Factor: 1.819).

[33] Y.-T. Shen, M. I. Daoud, and J. C. Lacefield, "Computational models of distributed aberration in ultrasound breast imaging," *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, vol. 57(12), pp. 2627–2636, 2010 (Impact Factor: 2.989).

[34] **M. I. Daoud** and J. C. Lacefield, "Stochastic modeling of normal and tumor tissue microstructure for high-frequency ultrasound imaging simulations," *IEEE Trans. Biomed. Eng.*, vol. 56(12), pp. 2806–2815, 2009 (Impact Factor: 4.491).

[35] **M. I. Daoud** and J. C. Lacefield, "Distributed three-dimensional simulation of B-mode ultrasound imaging using a first-order k-space method," *Phys. Med. Biol.*, vol. 54(17), pp. 5173–5192, 2009 (Impact Factor: 3.030).

[36] J. C. Tillett, M. I. Daoud, J. C. Lacefield, and R. C. Waag, "A k-space method for acoustic propagation using coupled first-order equations in three dimensions," *J. Acoust. Soc. Am.*, vol. 126(3), pp. 1231–1244, 2009 (Impact Factor: 1.819).

[37] **M. I. Daoud** and N. Kharma, "A high performance algorithm for static task scheduling in heterogeneous distributed computing systems," *J. Parallel Distrib. Comput.*, vol. 68(4), pp. 399–409, 2008 (Impact Factor: 0.859, 5-Year Impact Factor: 1.819).

Book Chapters

[1] M. Z. Ali, M. I. Daoud, R. Alazrai, R. G. Reynolds, "Evolving emergent team strategies in robotic soccer using enhanced cultural algorithms," in *Cultural Algorithms: Tools to Model Complex Dynamic Social Systems*, Hoboken, New Jersey, United States: John Wiley & Sons, pp. 119–139, 2021.

[2] R. Alazrai, **M. I. Daoud**, A. Khalifeh, N. Alnuman, Y. Mowafi, and D. Alabed, "A wavelet-based approach for estimating the joint angles of the fingers and wrist using electromyography signals," in *Communications in Computer and Information Science*, vol. 1002, Cham, Switzerland: Springer, pp. 31–45, 2019.

[3] M. I. Daoud, R. Alazrai, A. Alhusseini, D. Shihan, E. Alhwayan, D. I. Abou-Tair, and T. Qadoummi, "Interactive kinect-based rehabilitation framework for assisting children with upper limb cerebral palsy," in *ICTs for Improving Patients Rehabilitation Research Techniques, Communications in Computer and Information Science*, vol. 665, Cham, Switzerland: Springer, pp. 126–140, 2017.

[4] M. I. Daoud, A.-L. Alshalalfah, F. Awwad, and M. Al-Najar "A freehand 3D ultrasound imaging system using open-source software tools with improved edge-preserving interpolation," *Medical Imaging: Concepts, Methodologies, Tools, and Applications*, M. Khosrow-Pour, S. Clarke, M. E. Jennex, A. Becker, and A.-V. Anttiroiko, Ed., Hershey, PA, United States: IGI Global, pp. 1079–1098, 2017.

Refereed Conference Papers

[1] M. I. Daoud, W. Elmuhtadi, M. Faidi, Y. Alrahahleh, S. Abdel-Rahman, A. Al-Ali, B. A. Alsaify, R. Alazrai, "Diagnosing COVID-19 in chest X-ray images based on deep learning: transfer learning versus deep features extraction," The 13th International Conference on Information and Communication Systems (ICICS), pp. 246–251, Irbid, Jordan, Jun. 21–23, 2022.

[2] R. Alazrai, A. Awad, M. Z. Ali, **M. I. Daoud**, "An approach for recognizing two-human interactions using channel state information," the 9th International Conference on Electrical and Electronics Engineering (ICEEE), pp. 301–305, Alanya, Turkey, Mar. 29 – 31, 2022 (Podium Presentation).

[3] M. I. Daoud, A. Abuhani, A. R. Zayadeen, and R. Alazrai, "Needle detection in ultrasound images using ultrasound beamformed RF signals," the 8th International Conference on Electrical and Electronics Engineering (ICEEE), pp. 327–331, Antalya, Turkey, Apr. 9 – 11, 2021 (Podium Presentation).

[4] M. I. Daoud, Y. Alrahahleh, S. Abdel-Rahman, B. A. Alsaify, and R. Alazrai, "COVID-19 diagnosis in chest X-ray images by combining pre-trained CNN models with flat and hierarchical classification approaches," the 12th International Conference on Information and Communication Systems (ICICS), pp. 330–335, Valencia, Spain, May 24 – 26, 2021 (Podium Presentation).

[5] B. A. Alsaify, M. M. Almazari, R. Alazrai, and **M. I. Daoud**, "Exploiting Wi-Fi signals for human activity recognition," the 12th International Conference on Information and Communication Systems (ICICS), pp. 245–250, Valencia, Spain, May 24 – 26, 2021 (Podium Presentation).

[6] R. Alazrai, A. Awad, B. A. Alsaify, **M. I. Daoud**, "A Wi-Fi-based approach for recognizing humanhuman interactions," the 12th International Conference on Information and Communication Systems (ICICS), pp. 251–256, Valencia, Spain, May 24 – 26, 2021 (Podium Presentation).

[7] R. Alazrai, M. Hababeh, B. A. Alsaify, and **M. I. Daoud**, "Anatomical planes-based representation for recognizing two-person interactions from partially observed video sequences: A feasibility study," the 2021 8th International Conference on Electrical and Electronics Engineering (ICEEE), pp. 318–322, Antalya, Turkey, Apr. 9 – 11, 2021 (Podium Presentation).

[8] D. Alsbeih, M. I. Daoud, A.-K. Al-Tamimi, M. A. Al-Jarrahand, "A dynamic system for tracking biopsy needle in two dimensional ultrasound images," the 5th IEEE Middle East and Africa Conference on Biomedical Engineering (MECBME), pp. 1–4, Amman, Jordan, Oct. 27 – 29, 2020 (Podium Presentation).

[9] R. Alazrai, S. Al-Rawi, and **M. I. Daoud**, "A time-frequency distribution based approach for detecting tonic cold pain using EEG signals," the 19th IEEE International Conference on Bioinformatics and Bioengineering (BIBE), pp. 589–592, Athens, Greece, Oct. 28 – 30, 2019 (Podium Presentation).

[10] **M. I. Daoud**, A. Saleh, I. Hababeh, and R. Alazrai, "Content-based image retrieval for breast ultrasound images using convolutional autoencoders: a feasibility study," the 3rd IEEE International Conference on Bio-Engineering for Smart Technologies (BioSMART 2019), pp. 1–4, Paris, France, Apr. 24 – 26, 2019 (Podium Presentation).

[11] **M. I. Daoud**, S. Abdel-Rahman, and R. Alazrai, "Breast ultrasound image classification using a pretrained convolutional neural network," the 15th International Conference on Signal Image Technology and Internet Based Systems (SITIS 2019), pp. 167-171, Sorrento-Naples, Italy, Nov. 26 – 29, 2019 (Podium Presentation).

[12] R. Alazrai, K. M. A. Yousef, and **M. I. Daoud**, "Emotion recognition based on decoupling the spatial context from the temporal dynamics of facial expressions," the International Symposium on Networks, Computers and Communications (ISNCC), pp. 1–6, Istanbul, Turkey, June 18 – 20, 2019 (Podium Presentation).

[13] **M. I. Daoud**, A. Shtaiyat and R. Alazrai, "Investigating the influence of the kernel size on the performance of three-dimensional ultrasound volume reconstruction methods," the 11th IEEE Biomedical Engineering International Conference (BMEiCON 2018), pp. 1–5, Chaing Mai, Thailand, Nov. 21 - 24, 2018 (Podium Presentation).

[14] M. I. Daoud, A. Shtaiyat and R. Alazrai, "Enhanced needle detection in ultrasound images using acoustic excitation and ultrasound image analyses," the 11th IEEE Biomedical Engineering International Conference (BMEiCON 2018), pp. 1–5, Chaing Mai, Thailand, Nov. 21 – 24, 2018 (Podium Presentation).

[15] R. Alazrai, F. Alqasem, S. Alaarag, K. M. Yousef, and **M. I. Daoud**, "A Bispectrum-based Approach for Detecting Deception using EEG Signals," the 2018 IEEE 20th International Conference on e-Health Networking, Applications and Services (Healthcom 2018), pp. 1–6, Ostrava, Czech Republic, Sept. 17 – 20, 2018 (Podium Presentation).

[16] M. I. Daoud, S. Khraiwesh, A. Zayadeen, and R. Alazrai, "Accurate needle localization in twodimensional ultrasound images," the 10th IEEE International Conference on Electrical and Electronics Engineering (ELECO 2017), pp. 578–582, Bursa, Turkey, Nov. 30 – Dec. 2, 2017 (Podium Presentation).

[17] R. Alazrai, S. Aburub, F. Fallouh, and M. I. Daoud, "EEG-based BCI system for classifying motor imagery tasks of the same hand using empirical mode decomposition," the 10th IEEE International Conference on Electrical and Electronics Engineering (ELECO 2017), pp. 615–619, Bursa, Turkey, Nov. 30 – Dec. 2, 2017 (Podium Presentation).

[18] A. L. Alshalalfah, M. I. Daoud, and M. Al-Najar, "Adaptive kernel regression for freehand 3D ultrasound reconstruction," SPIE Medical Imaging 2017, *Proc. SPIE*, vol. 10139, 101390X, Orlando, Florida, United States, Feb. 11–16, 2017 (Podium Presentation).

[19] M. I. Daoud, A. L. Alshalalfah, and M. Al-Najar, "GPU accelerated implementation of kernel regression for freehand 3D ultrasound volume reconstruction," the 2016 IEEE EMBS Conference on Biomedical Engineering and Sciences (IECBES 2016), *Proc. 2016 IEEE EMBS Intl. Conf. Biomedical Engineering and Sciences*, pp. 586–589, Kuala Lumpur, Malaysia, December 4–8, 2016 (Podium Presentation).

[20] M. I. Daoud, A. A. Atallah, F. Awwad, and M. Al-Najar, "Accurate and fully automatic segmentation of breast ultrasound images by combining image boundary and region information," the 2016 IEEE 13th International Symposium on Biomedical Imaging (IEEE ISBI 2016), *Proc. 2016 IEEE 13th Intl. Symp. Biomedical Imaging*, pp. 718–721, Prague, Czech Republic, April 13–16, 2016 (Poster Presentation).

[21] M. M. Baba, O. Ait Mohamed, F. Awwad, and **M. I. Daoud**, "A low-cost camera-based transducer tracking system for freehand three-dimensional ultrasound," the 2016 14th IEEE International NEWCAS Conference (IEEE NEWCAS 2016), pp. 1–4, Vancouver, BC, Canada, June 26–29, 2016 (Poster Presentation).

[22] M. I. Daoud T. Qadoummi, and D. I. Abou-Tair, "An Interactive Rehabilitation Framework for Assisting People with Cerebral Palsy," the 2015 Workshop on ICTs for improving Patients Rehabilitation Research Techniques, *Proc. 2015 Workshop ICTs Improving Patients Rehabilitation Research Techniques (Published by ACM)*, pp. 46–49, Lisbon, Portugal, October 1–2, 2015 (Podium Presentation).

[23] M. I. Daoud, A. Alshalalfah, F. Awwad, and M. Al-Najar, "Freehand 3D ultrasound imaging system using electromagnetic tracking," the 2015 International Conference on Open Source Software Computing (OSSCOM 2015), Proc. 2015 Intl. Conf. Open Source Software Computing (Published by IEEE), pp. 1–5, Amman, Jordan, September 10–13, 2015 (Podium Presentation).

[24] M. I. Daoud, M. Ashi, F. Abawi, and A. Khalifeh, "In-house alert sounds detection and direction of arrival estimation to assist people with hearing difficulties," 14th IEEE/ACIS International Conference on Computer and Information Science, Proc. 2015 IEEE/ACIS 14th International Conference on Computer and Information Science, pp. 297–302, Las Vegas, NV, USA, June 28 – July 1, 2015 (Podium Presentation).

[25] M. I. Daoud, M. M. Baba, F. Awwad, M. Al-Najjar, and E. S. Tarawneh, "Accurate segmentation of breast tumors in ultrasound images using a custom-made active contour model and signal-to-noise ratio variations," The 8th International Conference on Signal Image Technology and Internet Based Systems, *Proc. 8th International Conference on Signal Image Technology and Internet Based Systems*, pp. 137–141, Naples, Italy, Nov. 25–29, 2012 (Podium Presentation).

[26] J. C. Chung, M. I. Daoud, F. Imani, P. Mousavi, and P. Abolmaesumi, "GPU accelerated implementation of ultrasound radio-frequency time series analysis," SPIE Medical Imaging 2012, *Proc. SPIE*, vol. 8320, 83201I, San Diego, CA, USA, Feb. 4–9, 2012 (Poster Presentation).

[27] **M. I. Daoud**, P. Abolmaesumi, W. You, S. E. Salcudean, R. N. Rohling, "Signature-based algorithm for improved needle localization in ultrasound images: a feasibility study," IEEE International Ultrasonics Symposium, *Proc. 2011 IEEE Intl. Ultrason. Symp.*, pp. 1575–1578, Orlando, FL, USA, Oct. 18–21, 2011 (Poster Presentation).

[28] F. Imani, M. I. Daoud, M. Moradi, P. Abolmaesumi, P. Mousavi, "Tissue classification using depthdependent ultrasound time series analysis: *in-vitro* animal study," SPIE Medical Imaging 2011, *Proc. SPIE*, vol. 7968, 79680F, Lake Buena Vista, FL, USA, Feb. 12–17, 2011 (Podium Presentation).

[29] F. Imani, M. Z. Wu, A. Lasso, E. C. Burdette, M. I. Daoud, G. Fichtinger, P. Abolmaesumi, P. Mousavi, "Monitoring of tissue ablation using time series of ultrasound RF data," 14th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2011), *Lecture Notes in Computer Science*, vol. 6891, pp. 379–386, Toronto, ON, Canada, Sep. 18–22, 2011 (Poster Presentation).

[30] **M. I. Daoud**, P. Mousavi, F. Imani, R. Rohling, and P. Abolmaesumi, "Computer-aided tissue characterization using ultrasound-induced thermal effects: analytical formulation and *in-vitro* animal study," SPIE Medical Imaging 2011, *Proc. SPIE*, vol. 7968, 79680G, Lake Buena Vista, FL, USA, Feb. 12–17, 2011 (Podium Presentation). [31] M. I. Daoud and J. C. Lacefield, "Three-dimensional computer simulation of high-frequency ultrasound imaging of healthy and cancerous murine liver tissues," SPIE Medical Imaging 2011, *Proc. SPIE*, vol. 7968, 79680H, Lake Buena Vista, FL, USA, Feb. 12–17, 2011 (Podium Presentation).

[32] M. I. Daoud and J. C. Lacefield, "Three-dimensional computational modeling of high-frequency ultrasound imaging of murine liver and liver metastases," 160th Meeting of the Acoustical Society of America, Cancun, Mexico, Nov. 15–19, 2010, published in *The Journal of the Acoustical Society of America*, vol. 128, p. 2364, 2010. (Podium Presentation).

[33] **M. I. Daoud** and J. C. Lacefield, "Stochastic modeling of tissue microstructure for high-frequency ultrasound imaging simulations," SPIE Medical Imaging 2009, *Proc. SPIE*, vol. 7262, 72620P, Lake Buena Vista, FL, USA, Feb. 7–12, 2009 (Podium Presentation).

[34] T. Singh, N. Kharma, **M. Daoud**, and R. Ward, "Genetic programming based image segmentation with applications to biomedical object detection," 2009 Genetic and Evolutionary Computation Conference (GECCO 2009), *Proc. 2009 Gene. Evol. Comp. Conf.*, pp. 1123–1130, Montreal, QC, Canada, Jul. 8–12, 2009 (Podium Presentation).

[35] J. C. Lacefield, M. I. Daoud, S. Z. Pinter, L. A. Wirtzfeld, and A. Fenster, "Tools for planning and performing longitudinal cancer studies in mice using high-frequency ultrasound," 34th International Symposium on Ultrasonic Imaging and Tissue Characterization, *Ultrason. Imaging*, vol. 31, p. 74, Arlington, VA, USA, Jun. 10–12, 2009 (Invited Podium Presentation).

[36] **M. I. Daoud** and J. C. Lacefield, "Efficient three-dimensional simulation of ultrasound imaging using a parallel k-space method," 31st Canadian Medical and Biological Engineering Conference (CMBEC31), Montreal, QC, Canada, Jun. 11–13, 2008 (Four Page Paper, Podium Presentation).

[37] M. I. Daoud and J. C. Lacefield, "Stochastic modeling of murine liver microanatomy for high-frequency ultrasound imaging simulations," 6th International Conference on Ultrasonic Biomedical Microscanning, Malibu, CA, USA, Sep. 23–26, 2008 (Podium Presentation).

[38] **M. I. Daoud** and J. C. Lacefield, "Parallel three-dimensional simulation of ultrasound imaging," 22nd International Symposium on High Performance Computing Systems and Applications (HPCS 2008), *Proc.* 22nd Intl. Symp. High Perform. Comp. Sys. Appl., pp. 146–152, Quebec City, QC, Canada, Jun. 9–11, 2008 (Podium Presentation).

[39] **M. I. Daoud**, Y.-T. Shen, and J. C. Lacefield, "A scalable parallel implementation of a k-space method for large-scale ultrasound imaging simulations," IEEE International Ultrasonics Symposium, *Proc. 2006 IEEE Intl. Ultrason. Symp.*, pp. 2194–2197, Vancouver, BC, Canada, Oct. 3-6, 2006 (Poster Presentation).

[40] **M. I. Daoud** and N. Kharma, "An efficient genetic algorithm for task scheduling in heterogeneous distributed computing systems," 2006 IEEE Congress on Evolutionary Computation (CEC 2006), *Proc.* 2006 IEEE Cong. Evol. Comp., pp. 3258–3265, Vancouver, BC, Canada, Jul. 16–21, 2006 (Podium Presentation).

[41] **M. I. Daoud** and N. Kharma, "Efficient compile-time task scheduling for heterogeneous distributed computing systems," 12th International Conference on Parallel and Distributed Systems (ICPADS), *Proc. 12th Intl. Conf. Para. Dist. Sys.*, vol. 1, pp. 11–22, Minneapolis, MN, USA, Jul. 12–15, 2006 (Podium Presentation).

[42] **M. Daoud** and N. Kharma, "GATS 1.0: a novel GA-based scheduling algorithm for task scheduling on heterogeneous processor nets," 2005 Genetic and Evolutionary Computation Conference (GECCO 2005), *Proc. 2005 Gene. Evol. Comp. Conf.*, vol. 2, pp. 2209–2210, Washington, DC, USA, Jun. 25–29, 2005 (Poster Presentation).

[43] **M. Daoud**, N. Kharma, A. Haidar, and J. Popoola, "Ayo, the Awari player, or how better representation trumps deeper search," 2004 IEEE Congress on Evolutionary Computation (CEC 2004), *Proc. 2004 IEEE Cong. Evol. Comp.*, vol. 1, pp. 1001–1006, Portland, OR, USA, Jun. 19–23, 2004 (Podium Presentation).

Invited Lectures

[1] M. I. Daoud, "Three-dimensional computational modeling of preclinical ultrasound cancer imaging," Bioacoustics Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL, Sep. 8, 2009.

[2] M. I. Daoud, "Parallel three-dimensional simulation and analysis of high-resolution ultrasound images," Electrical and Computer Engineering, University of British Columbia, Vancouver, BC, Nov. 18, 2009.

GRADUATE STUDENTS SUPERVISION

Amer Al Ali (M.Sc. student), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2019–2021 (currently works as research assistant in the Department of Computer Engineering, German Jordanian University, Amman, Jordan).

Hanan Al-Najar (M.Sc. student), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2018–2020 (currently works as Android developer at Diamond Software Technology, Amman, Jordan).

Lina Hammad (M.Sc. student co-supervised with Dr. Ismail Hababeh), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2018–2020 (currently works as assistant instructor in the Data Science and Artificial Intelligence Department, Al Hussein Technical University, Amman, Jordan).

Samir Abdel-Rahman (M.Sc. student), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2018–2020 (currently works as PhD candidate at the University of Western Ontario, London, Canada).

Abdullah Al-Husseini (M.Sc. student), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2017–2019 (currently works as web developer at Siemens Inc., Munich, Germany).

Amro Saleh (M.Sc. student co-supervised with Dr. Ismail Hababeh), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2017–2019 (currently works as big data engineer at Microsoft Inc., Amman, Jordan).

Samira Khraiwesh (M.Sc. student), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2016–2018 (currently works as teaching and research assistant in the Department of Electrical Engineering, German Jordanian University, Amman, Jordan).

Ahmad Shtayat (M.Sc. student), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2015–2017 (currently works as research assistant in the Department of Computer Engineering, German Jordanian University, Amman, Jordan).

Medya Omar (M.Sc. student co-supervised with Dr. Ismail Hababeh), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2014–2017.

Tariq Bdair (M.Sc. student), Department of Computer Engineering, German Jordanian University, Amman, Jordan, 2014–2016 (currently works as PhD candidate at the Technical University of Munich, Munich, Germany).

Mohammad Baba (M.A.Sc. student unofficially co-supervised with Dr. Otmane Ait Mohamed), Department of Electrical and Computer Engineering, Concordia University, Montreal, QC, Canada, 2013 –2016 (currently works as senior design and verification engineer at Microchip Technology Inc., Montreal, Canada).

TEACHING, RESEARCH, AND ADMINISTRATIVE EXPERIENCE A. ADMINISTRATIVE: Founder and Director of the Center for e-Learning and Academic Performance Improvement (CeLAPI) 2021 - Present German Jordanian University, Amman, Jordan **President's Advisor for Digital Teaching** 2020 - 2021German Jordanian University, Amman, Jordan Head of the e-Learning Committee 2019 - 2021German Jordanian University, Amman, Jordan Head of the Scientific Research Ethics Committee 2019 - 2020German Jordanian University, Amman, Jordan Member of the Higher Education Council 2018 - 2021German Jordanian University, Amman, Jordan 2015 - 2016Member of the School Council 2019 - 2021School of Electrical Engineering and Information Technology 2012 - 2016German Jordanian University, Amman, Jordan Member of the Graduate Studies Committee 2015 – Present Department of Computer Engineering German Jordanian University, Amman, Jordan Member of the Industrial Relations Committee 2017 - 2017German Jordanian University, Amman, Jordan **Department Head** 2012 - 2015Department of Computer Engineering German Jordanian University, Amman, Jordan Member of the University Council 2014 - 2015German Jordanian University, Amman, Jordan Member of the Scientific Research and Graduate Studies Committee 2013 - 2016School of Electrical Engineering and Information Technology German Jordanian University, Amman, Jordan Member of the Electrical Engineering Program Committee 2015 - 2015School of Electrical Engineering and Information Technology German Jordanian University, Amman, Jordan **Industry Liaison Officer** 2012 - 2014

School of Electrical Engineering and Information Technology German Jordanian University, Amman, Jordan

<u>B. TEACHING AND RESEARCH:</u>	
Professor Associate Professor Assistant Professor	2020 – Present 2016 – 2020 2011 – 2016
Department of Computer Engineering German Jordanian University, Amman, Jordan	
 Established a state-of-the-art medical image and signal analysis research lab at the German Jordanian University Led the efforts to develop an intelligent computing system to diagnose breast cancer based on breast ultrasound images (research project in collaboration with the Jordan University Hospital, Amman, Jordan) Led the efforts to develop an intelligent computing system to localize and visualize medical needles in ultrasound images with the goal of improving the safety and accuracy of ultrasound-guided needle interventions Led the efforts to develop an interactive rehabilitation system to engages children with cerebral palsy in game-based physical exercises (research project in collaboration with Dr. Rami Alazrai and Our Lady of Peace Centre, Amman, Jordan) 	
Adjunct Associate Professor Hardware Verification Group Concordia University, Montreal, Canada	2015 – Present
Postdoctoral Research Fellow Department of Electrical and Computer Engineering The University of British Columbia, Vancouver, BC, Canada	Mar. 2010 – Sep. 2011
Lecturer Visiting Lecturer Department of Electrical and Computer Engineering The University of British Columbia, Vancouver, BC, Canada	Jan. 2011 – Apr. 2011 Sep. 2010 – Dec. 2010
Postdoctoral Fellow Department of Electrical and Computer Engineering The University of Western Ontario, London, ON, Canada	Sep. 2009 – Dec. 2009
Research Assistant – PhD Candidate Department of Electrical and Computer Engineering The University of Western Ontario, London, ON, Canada	Sep. 2005 – Aug. 2009
Teaching Assistant – Part Time Department of Electrical and Computer Engineering The University of Western Ontario, London, ON, Canada	Sep. 2005 – Apr. 2009
Lecturer – Part Time Faculty of Engineering and Information Technology Arab American University, Jenin, Palestine	Jun. 2005 – Aug. 2005
Programmer Analyst Research and Development Department SoftSim Technologies Inc., Longueuil, QC, Canada	Aug. 2004 – May 2005
Research Assistant - Graduate Student Department of Electrical and Computer Engineering Concordia University, Montreal, QC, Canada	Jan. 2003 – Jan. 2005
Teaching Assistant – Part Time Department of Electrical and Computer Engineering Concordia University, Montreal, QC, Canada	Jan. 2003 – Apr. 2004

M. I. DAOUD

CONFERENCE ORGANIZATION

Member of the Scientific Committee, The 2nd International Conference on Open Source Software Computing (OSSCOM 2016 – Sponsored by IEEE), Beirut, Lebanon, 2016.

Member of the Organizing Committee, The 9th National Technology Parade (NTP 2016), Amman, Jordan, 2016.

Member of the Organizing Committee, The 1st International Conference on Open Source Software Computing (OSSCOM 2015 – Sponsored by IEEE), Amman, Jordan, 2015.

Member of the Organizing Committee and the Scientific Review Committee, Second Annual Canadian Student Conference on Biomedical Computing (CSCBC 2007), The University of Western Ontario, London, ON, Canada, 2007.

EXTRACURRICULAR ACTIVITIES

Chair of the Organizing Committee, The 10th National Technology Parade (Jordan National-Level Competition for the Graduation Projects of Bachelor Engineering Students), German Jordanian University, Amman, Jordan, May 4, 2017.

Reviewer, The 9th National Technology Parade (NTP 2016), Al-Ahliyya Amman University, Amman, Jordan, May 4, 2016.

Lead the efforts to organize a Parallel Programming Workshop, German Jordanian University, Amman, Jordan, Sep. 12, 2015.

Lead the efforts to organize an Open Source Software Workshop, German Jordanian University, Amman, Jordan, May 5-7, 2015.

Reviewer, The 8th National Technology Parade (NTP 2015), The University of Jordan, Amman, Jordan, Apr. 29, 2015.

Lead a team of students (M. Ashi and F. Abawi) to win the second place in the local (Jordan-level) competitions of the Microsoft Imagine Cub, Amman, Jordan, 2014. The project was focused on developing a wearable device to assist people with hearing disabilities by detecting alert sounds and determining their direction of arrival.

Reviewer, The Fifth National Technology Parade (NTP 2012), The Hashemite University, Zarqa, Jordan, May 7-8, 2012.

Judge, 39th Annual London District Science & Technology Fair, London, ON, Canada, 2009.

External Communications Coordinator, IEEE Engineering in Medicine and Biology Society (EMBS) Student Chapter, The University of Western Ontario, London, ON, Canada, 2006 – 2009.

Member of the Social Committee, Network of Imaging Students, Robarts Research Institute, London, ON, Canada, 2006 – 2009.

Website Administrator, Network of Imaging Students, Robarts Research Institute, London, ON, Canada, 2006 – 2009.

Website Administrator, Second Annual Canadian Student Conference on Biomedical Computing (CSCBC 2007), The University of Western Ontario, London, ON, Canada, 2007.

LANGUAGES

Arabic (fluent – mother tongue), English (fluent), French (basic)

TECHNICAL SKILLS

Operating Systems: Linux, UNIX, Microsoft Windows, Mac OS X

Programming Languages and Packages: C++, C, Java, Fortran, MATLAB, Microsoft Visual Studio, Borland C++, gcc, makefile, OpenGL Graphics Library, MPI Parallel Computing library, OpenMp Parallel Computing library, VTK visualization toolkit, ITK registration and segmentation toolkit, CVS version control system, FFTW fastest Fourier transform library

Software Applications: Microsoft Office, Microsoft Visio, Adobe Photoshop, CorelDRAW Graphics Suite X3, Adobe Flash, Adobe Director, LaTex document preparation system, EndNote reference management software, ImageJ image processing program, CellProfiler image processing program, PSpice analog circuit and digital logic simulation software, GraphPad Prism spread-sheet software

Other Skills: developing data mining classification algorithms, building evolutionary-based optimization software, software engineering concepts and techniques, developing C++ programs for shared-memory and distributed-memory computer clusters, configuring CISCO routers and switches