Mohammad Ayache – PhD in Biomedical Engineering, Professor

Signal and Image Processing - Machine Learning Applications

DOB: 15/4/1981
Email : m.ayache@bau.edu.lb
Mobile: +9613375703

Address:
Chiah, Mar Mkhayel strreet,
Kamar 2 Bdg, 3rd Floor
Beirut, Lebanon

Education

- **December 2007**: PHD in "Sciences de la vie et Santé », University of Tours, France.
- **September 2004**: Master Degree (DEA) in Signals and Images for Biology and Medicine, University of Angers, France. Training (6 months): Study of The Ovarian Vascularization, MRI Application, INSERM U 619 (Tours).
- **July 2003**: Bachelor of Engineering (Biomedical Engineering), Islamic University of Lebanon. Final Project Title: **Microcontroller** Based ECG Simulator.

Position

- **September 2022**: Associate Professor - Biomedical Engineering Program / ECE Department - Faculty of Engineering, Beirut Arab University.
- **June 2022**: Professor at the Biomedical Engineering Department - Faculty of Engineering, Islamic University of Lebanon.
- **November 2020 – June 2022**: Dean of the Faculty of Engineering, Islamic University of Lebanon.
- **January 2018- October 2020**: Head of Graduate Studies – Faculty of Engineering – Islamic University of Lebanon
- **March 2014- December 2017**: Vice Dean of the Faculty of Engineering, Islamic University of Lebanon.
- **January 2009 – December 2017**: Head of Biomedical Engineering Department - Islamic University of Lebanon.

Teaching Experience:

- **Fall 2022 – Present:** Beirut Arab University: Artificial Organs, Introduction to Neuroscience, Biophysics, Research Methodology, Control Systems, and Linear Algebra.
- **Fall 2004 – Spring 2022:** Islamic University of Lebanon: Medical Imaging I, Medical Imaging II, Medical Imaging III, Artificial Organs, Biomechanics, and Quality Control.
- **Fall 2012 – Fall 2014:** Lebanese University, Faculty of Engineering (master 2 research), Imaging and Image Recognition.
- **Spring 2012 – Spring 2022: -** Lebanese University (IUT Saida): Line Transmission – Digital Electronics Lab.
- **Spring 2005 - Fall 2008**: LIU: Biophysics, Biomedical Electronics, Linear Systems (Master course), signal processing, advanced signal processing (master course), image processing (master course), Electronics.

- **Spring 2008 – Spring 2014**: AUL: Digital Image Processing, Digital signal Processing, Electrodynamics, Electricity and Magnetism, Engineering Math II, Engineering math I.
- **Fall 2004 – Spring 2022:** IPNET: Power Electronics, Hyperfrequencies, Signal Processing, Control Systems.

PhD thesis Supervision and Co-Supervision:

1. An Ontological Model Integrated with Machine Learning for Early Prediction of Obesity. PhD thesis main Supervisor / Beirut Arab University (in Progress).
2. AI Driven Secure Biometric Authentication for Real Time Human Recognition. PhD thesis Co – Supervisor / Beirut Arab University (in Progress)
3. Modélisation des dynamiques d'insertion et d'injection pour la curiethérapie robotisée de la prostate. Research project between the university of Lille 1 and the Islamic University of Lebanon (defended in December 2015).
4. Analysis of evolutionary development of systems: application to humanoid robots. Research project between the university of Lille 1 and the Islamic University of Lebanon (defended in December 2015)
5. Application à la prévention du comportement en vue du diagnostic et de la commande : application à la prévention de la chute chez les parkinsoniens. Research project between the university of le Havre and the Islamic University of Lebanon (defended in December 2016)

Master thesis Supervision:

- 2007- Present: Supervising of a lot of master thesis in master 2 research at Islamic University of Lebanon and Lebanese University (Signal and Image Processing, Machine Learning Applications, Artificial Intelligence).

Publications – Journal Publications

1- Ismail Khram, Fathelalem A. Hija, Ali Haidar, Mohammad Ayache, "A Hybrid Deep Learning Framework for Robust Dorsal Vein Biometric Authentication", International Journal of Online and Biomedical Engineering. (Accepted).

2- Al Moghrabi, Hala; Audi, Zahraa; **Ayache, Mohammad**; Estephan, Elias; Nasser, Zeina; Nakkash Chmaisse, Hania; Harati, Hayat, "Brain-Computer Interfaces in Neurodegenerative Disorders Causing Paralysis: A Systematic Review and Meta-Analysis", Journal of Healthcare Technology Reports (Submitted in October 2025, Review in Progress).

3- J. Haidar, W. Fahs, **M.Ayache**, Issues and Innovation for Setting and Infrastructure Management in the Islamic University of Lebanon in the Time of Pandemic, Journal of Sustainability Perspectives, Volume 2, Issue 1, 2022, 39-46.

4- Israa Nadher, **Mohammad Ayache**, Hussein Kanaan, Heart Disease Prediction System Using Machine Learning Algorithm, Iraqi Journal of Information and Communication Technology, Volume 1, Issue 1 , 146-176, 2021.

5- A. Abou Ahmad, **M. Ayache**, A. Daher, Sum of Sine Modeling Approach as a New Processing Technique For a Biometric System Based on ECG Signal, International Journal of biology and Biomedical Engineering, Volume 14,2020, pp 204-209.

6- Mohammed Ajam, Hussein Kanaan, Lina El Khansa, **Mohammad Ayache**, Identification of ischemic stroke by marker controlled watershed segmentation and feature extraction, Int. Arab J. Inf. Technol, volume 17, Issue 4A, 671-676, 2020.

7- M. Abdul Sater, H. Kanaan, **M. Ayache**, Promising Database for Palm Vein Classification, International Journal of Biology and Biomedical Engineering, Volume 13,2019, pp 149-160.

8- Zeinab Abbas, Ali Saad, **Mohammad Ayache** and Chadi Fakih "Applications of Logistic Regression and Artificial Neural Neywork for ICSI Prediction" International Arab Journal of Information Technology (IAJIT), Volume 16, 2019, pp 557-564.

9- Ali Saad, Iyad Zaarour, François Guerin, Paul Bejjani, **Mohammad Ayache**, Dimitri Lefebvre.' Detection of Freezing of Gait for Parkinson's disease patients with multi-sensor device and Gaussian neural networks'. International Journal of Machine Learning and Cybernetics, Springer, Volume 8, Issue 3, 941-954, 2017.

10- Iyad Zaarour, Ali Saad, Abbas Zein Eldine, **Mohammad Ayache**, François Guerin, Paul Bejjani, Dimitri Lefebvre. 'Methodologies for the diagnosis of the main behavioural syndromes for Parkinson Disease with Bayesian Belief Networks', Emerging Trends in Computational Biology, Bioinformatics, and Systems Biology - Algorithms and Software Tools, 467-485, 2015.

11- Ali Saad, Iyad Zaarour, Paul Bejjani, **Mohammad Ayache**, Dimitri Lefebvre, Francois Guérin: A preliminary study of the causality of freezing of gait for Parkinson's disease patients: Bayesian belief network approach, International journal of computer Science issues, volume 10, Issue 3, Nº 2 May 2013, 88-95.

12- Ali Raad, Ali Kalakech, Lina el Khansa, **Mohammad Ayache**, Breast Cancer Classification using artificial neural network: MLP and RBF, Sawt el Jamiaa Journal, semiannual peer reviewed academic journal, Islamic University of Lebanon, issue four, 105-117, 2012.

13- Ali Saad, Iyad Zaarour, Paul Bejjani, **Mohammad Ayache**: Handwriting and Speech Prototyopes of Parkinson Patients: Belief Network Approach, International journal of computer Science issues, volume 9, Issue 3, May 2012, 499-505.

14- **Mohammad Ayache**, Mohamad Khalil, Francois Tranquart, Artificial Neural Network for Transfer Function Placental Development: DCT and DWT Approach, International journal of computer Science issues, volume 8, Issue 5, September 2011, 21-27.

15- Mahmoud Abbas, **Mohammad Ayache**, Determination of the Complex dielectric Permittivity Industrial Materials of the Adhesive Products for the Modeling of an Electromagnetic Field at the level of a Glue Joint. International Journal of computer science issues, volume 8, Issue 3, May 2011, 597-601.

16- Youssef Harkouss, Walid Fahs, **Mohammad Ayache**, A new algorithm for structure optimization of wavelet neural network, international journal of computer science issues, volume 8,issue 2, March 2011,108-11.

17- Ahmad Chokeir, Batoul Fneish, Nour Zaarour, Walid Fahs, **Mohammad Ayache, Health Smart Home,** international journal of computer science issues, volume 7,issue 6, pp 126-130,2010.

18- **M.AYACHE**, M.KHALIL, F.TRANQUART, DWT to Classify Automatically the Placental Tissues Development: Neural Network Approach, Journal of Computer Science 6(5):505-511, 2010, ISSN 1549-3636, Science Publication.

19- **M Ayache**, M Khalil, C Paillet, F Perrotin, F Tranquart, A neural network approach for classification of placental tissues using discrete wavelet transform, Lebanese science journal, volume 10, issue 2 , page 49-58, 2009.

20- **M.AYACHE**, M.KHALIL, F.TRANQUART, Neural Network Approach to classify automatically the Placental Tissues Development: MLP and RBFF." Intelligent Engineering Systems through Artificial Neural Networks, Volume 18, 2008, edited by C.H. Dagli et al. New York: ASME Press, pages 301-307.

Publications – Conference Publications

1- Hussein El Hajj Youssef, Abbas Yassine, Salim Allabban, Manal Himada, Mohammad Zuhair Abou Hadba, Imane Haidar, Amira Zaylaa, **Mohammad Ayache**, Ali Haidar, "Obstructive Sleep Apnea Detection System Using Electrocardiogram (ECG) Signals", 2025 Eighth International Conference on Advances in Biomedical Engineering (ICABME2025), October 2025, IEEE, pp 1-5.
2- Hala Al Moghrabi, Zahraa F Audi, **Mohammad Ayache**, Hania Nakkash Chmaisse, Hayat Harati, "Meta-Analysis of Fnirs, Hybrid, and Artistic Brain-Computer Interfaces for Neurological Disorders", 2025 Eighth International Conference on Advances in Biomedical Engineering (ICABME2025), October 2025, IEEE, pp 1-7.
3- H Al Moghrabi, ZF Audi, **M Ayache**, HN Chmaisse, H Harati, E Estephan, "Brain-Computer Interfaces in Neurodegenerative Disorders Causing Paralysis: A Systematic Review and Meta-Analysis", 2025 Eighth International Conference on Advances in Biomedical Engineering (ICABME2025), October 2025, IEEE, pp 1-7.
4- Layla Dakdouk, Julie Bu Daher, Mahmoud Skafi, **Mohammad Ayache**, Machine Learning and Deep Learning Approaches for Obesity Prediction: a Systematic Review, 2025 Eighth International Conference on Advances in Biomedical Engineering (ICABME2025), October 2025, IEEE, pp 1-10.
5- Mohammad Zuhair Abo Hadba, Amira J Zaylaa**, Mohammad Ayache**, "ECG Signal Classification for Heart Disease Detection: A Systematic Review and Future Directions, 2025 Eighth International Conference on Advances in Biomedical Engineering (ICABME2025), October 2025, IEEE, pp 1-8.
6- I Khram, FA Hija, A Haidar, **M Ayache**, "AI Driven Individual Identification Using Palm Veins: A Systematic Review, Challenges, and Future Perspectives", 2025 Eighth International Conference on Advances in Biomedical Engineering (ICABME2025), October 2025, IEEE, pp 1-10.
7- M. N. Younis, S. H. Sleiman, S. Khadra, A. Zaylaa, A. Daher, and **M. Ayache**, "Building a Brain Computer Interface (BCI) Using Electroencephalogram (EEG) Signals' Classification," presented at the 2023 Seventh International Conference on Advances in Biomedical Engineering (ICABME), IEEE, 2023, pp. 130–136.
8- A. Daher, **M. Ayache**, A. J. Zaylaa, M. Z. A. Hadba, Y. Aycha, and H. Hmadeh, "Artificial Intelligence-Powered System for Detecting, Diagnosing, and Rehabilitating Strabismus Disorder," presented at the 2023 Seventh International Conference on Advances in Biomedical Engineering (ICABME), IEEE, 2023, pp. 220–225.

9- A. J. Zaylaa, A. Daher**, M. Ayache**, N. Omeirat, R. Mahmoud, and B. Abou Hawili, "Early Diagnosis of Osteoporosis: An Artificial Intelligence-Based Framework," presented at the 2023 Seventh International Conference on Advances in Biomedical Engineering (ICABME), IEEE, 2023, pp. 226–231.

10- A. Daher, **M. Ayache**, E.-H. Heba, M. K. Fattoum, and O. Hajj, "Wireless Healthcare Monitoring System for Heart Diseases Classification using Efficient ECG-Based Wave Modeling and Machine Learning Techniques," presented at the 2023 Fifth International Conference on Advances in Computational Tools for Engineering Applications (ACTEA), IEEE, 2023, pp. 19–24.

11- **M. Ayache** and A. Daher, "Engineering Education Program Enhancement Based on Modern Teaching Methodologies: System of Systems Approach," presented at the 2023 18th Annual System of Systems Engineering Conference (SoSe), IEEE, 2023, pp. 1–6.

12- Aghyad Al Skaif, **Mohammad Ayache**, Hussein Kanaan, Energy consumption clustering using machine learning: K-means approach, 2021 22nd International Arab Conference on Information Technology (ACIT), 1-7, 2021.

13- Zeinab Farhat, Abbas Rammal, **Mohammad Ayache**, Digital deparaffinization of Raman spectral image acquired on FFPE human skin tissue, 2021 Sixth International Conference on Advances in Biomedical Engineering (ICABME), 9-14, 2021.

14- **Mohammad Ayache**, Hussien Kanaan, Kawthar Kassir, Yasser Kassir, Speech Command Recognition Using Deep Learning, 2021 Sixth International Conference on Advances in Biomedical Engineering (ICABME), 24-29, 2021.

15- Alaa Daher, Sally Yassin, **Mohammad Ayache**, A Novel ECG Waves Detection Followed by a New Compression Technique Based on Fourier Series Modeling for up to 26 Days Holter Monitor, 2021 Sixth International Conference on Advances in Biomedical Engineering (ICABME), 163-166, 2021.

16- Hatem Tarhini, Rayan Mohamad, Abbas Rammal, **Mohammad Ayache**, Lung Segmentation followed by Machine Learning & Deep Learning Techniques for COVID-19 Detection in lung CT Images, 2021 Sixth International Conference on Advances in Biomedical Engineering (ICABME), 222-227, 2021.

17- Khouloud Lobnan Issa, Abbass Rammal, Ahmad Rammal, **Mohammad Ayache**, Fully Automatic Detection of Premature Ventricular Contractions: A New Approach Based On Unsupervised Learning, 2021 Sixth International Conference on Advances in Biomedical Engineering (ICABME), 202-207, 2021.

18- Wafaa Fayad, **Mohammad Ayache**, Hussein Kanaan, Individual Palm Vein Identification: Machine Learning Approach, 2021 Sixth International Conference on Advances in Biomedical Engineering (ICABME), 93-98, 2021.

19- M.Ayad, H. Kanaan, **M.Ayache**, diabetes Disease Prediction Using Artificial Intelligence, 2020 21st International Arab Conference on Information Technology (ACIT), 1-6,2020.

20- M. Ajam, H.Kanaan, L. ElKhansa, **M. Ayache**, Ischemic Stroke Identification by Using Watershed Segmentation and Textural and Statistical Features, 2019 International Arab Conference on Information Technology (ACIT), 255-2258,2019.

21- M. Abdallah, A. Saad, **M. Ayache**, Freezing of Gait Detection: Deep Learning Approach, 2019 International Arab Conference on Information Technology (ACIT), 259-261, 2019.

22- Maha Halla Abdul Sater ; Hussein Kanaan ; **Mohammad Ayache**, Identification of individuals using palm vein classification, 2019 Fifth International Conference on Advances in Biomedical Engineering (ICABME), Lebanon, October 17-19, 2019.

23- Mohammed Ajam ; Hussein Kanaan ; **Mohammad Ayache** ; Lina el Khansa, Segmentation of CT Brain Stroke Image using Marker Controlled Watershed**,** 2019 Fifth International Conference on Advances in Biomedical Engineering (ICABME), Lebanon, October 17-19, 2019.

24- Mouhamad Mourad, Mohamed Ajam, **Mohammad Ayache**, 'Liver Tumor Ablation Enhancement by Lean Concept ', Cancer Care Informatics Conference CCI2018, Jordan, Amman, November 19-21, 2018.

25- Zeinab Abbas, Chadi Fakih, Ali Saad, **Mohammad Ayache**, "Vaginal Power Doppler Parameters as New Predictors of Intra-Cytoplasmic Sperm Injection Outcome" International Arab Conference on Information Technology, ACIT 2018, Lebanon, November 28-30, 2018.

26- Ali Hammoud, Rana Jaber, **Mohammed Ayache**, 'Activity measurement for elderly population using smart phone: criterion validity in daily life', International Conference on SENSORS, NETWORKS, SMART And EMERGING TECHNOLOGIES (SENSET 2017), Lebanon, September 12-14, 2017.

27- Ali Saad, Dimitri Lefebvre, François Guerin, **Mohammad Ayache**, Paul Bejjani, Iyad Zaarour, 'A Bayesian network approach for the detection of freezing of gait in Parkinson's disease using a multi-sensor device', International Conference on Bio-engineering for Smart Technologies (BioSMART 2016), Dubai (UAE), Dec. 4th-7th, 2016.

28- Amanda Hachem, **Mohammad Ayache**, Lina el Khansa, Ali Jizzini, ECG Classification for Sleep Apnea Detection, Third Middle East Conference on Biomedical Engineering (MECBME), Lebanon, October 6,7, 2016.

29- A. Koubeissi, **M. Ayache**, M.Abbas, R. Merzouki, B. Conrard, 'Fault Tolerance Level Assessment of a Wireless Communication Link in a System of System Concept Modeled using Bond Graph', IEEE International Conference on Advances in Biomedical Engineering (ICABME), Sept 16-18, 2015, pages: 65 - 68, Hadath, Lebanon.

30- A. Harb, M.Abbas, A. Cherry, H. Jaber, **M. Ayache**, Palm Print Recognition, 2015 International Conference on Advances in Biomedical Engineering (ICABME), Sept 16-18, 2015, pages: 13-16, Hadath, Lebanon.

31- A. Raad, **M. Ayache**, A. Abboud, A. Mourad, R. Merzouki, D. Pasquier, E. Lartigeau, Volume Variation of the Parotid Gland Using Adaptive Radiotherapy, 2015 International Conference on Advances in Biomedical Engineering (ICABME), Sept 16-18, 2015, pages: 65 - 68, Hadath, Lebanon.

32- A. Jizzini, **M. Ayache**, L. Elkhansa, Z. ElAbidin Ibrahim, ECG Classification for Sleep Apnea detection, 2015 International Conference on Advances in Biomedical Engineering (ICABME), Sept 16-18, pages 301-304, Hadath, Lebanon.

33- Ahmad Koubeissi, **Mohammad Ayache**, Rochdi Merzouki and Blaise Conrard, Bond Graph Model-Based for Fault Tolerance Level Assessment of Wireless Communication Link in a System of Systems Concept, International Conference of SoS Engineering, March 17 – 20, 2015, San Antonio, Texas, USA

34- Ali Saad, François Guerin, Iyad Zaarour, **Mohammad Ayache**, Dimitri Lefebvre. 'Sensoring and Features Extraction for the Detection of Freeze of Gait in Parkinson Disease', in the IEEE 11th International Multi-Conference on Systems, Signals & Devices (SSD). Barcelona, Spain, 11th to 14th February 2014, p. 1 - 6.

35- Ahmad Koubeissi, **Mohammad Ayache** and Rochdi Merzouki, Multilevel Graphical Modeling for System of Systems: Bondgraph Model for a Wireless Communication Link with Redundancy, International Conference of Robotics and Biomimetics, December 5 – 10,2014, Bali, Indonesia, Pages (2055 – 2061)

36- A. Raad, **M. Ayache**, A. Abboud, A. Permezel, R. Merzouki and E. Lartigau, Deformable Image Tracking of The Parotid Gland for AdaptiveRadiotherapy Application, Engineering in medicine and biology society (EMBC), 2014 36th Annual International Conference of the IEEE, 20-30 Aug.2014, Chicago, USA.

37- Ahmad Koubeissi, **Mohammad Ayache**, and Rochdi Merzouki, Bondgraph Model for System of Systems Wireless Communication Link, IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM),July 8-11, 2014. Besançon, France, Pages (427 – 432)

38- A. Raad, **M. Ayache**, A. Abboud, A. Permezel, R. Merzouki and E. Lartigau, Target Evolution Modeling for Robotized Adaptive Radiotherapy, IEEE International Conference on Advanced Intelligent Mechatronics (AIM) July 8-11, 2014. Besançon, France.

39- A Saad, A Zeineldine, I Zaarour, **M Ayache**, D Lefebvre, F Guerin, P Bejjani, A Preliminary Approach to Study the Causality of Freezing of Gait for Parkinson's: Bayesian Belief Network Approach, Proceedings of the International Conference on Data Science (ICDATA), 2013.

40- Ali Saad, Iyad Zaarour, Dimitri Lefebvre, François Guerin, Paul Bejjani, **Mohammad Ayache**. 'About Detection and Diagnosis of Freezing of Gait', in the IEEE 2nd International Conference on Advances in Biomedical Engineering. Tripoli, Lebanon, 11th to 13th September 2013. p. 117 - 120.

41- Ali Jezzini, **Mohammad Ayache**, Lina Elkhansa, Bassem Makki, Maya Zein, Effects of predictive maintenance (PdM), Proactive maintenance (PoM) & Preventive maintenance (PM) on minimizing the faults in medical instruments, 2013 2nd International conference on advances in biomedical engineering, 53-56, 2013.

42- Ali Saad, Iyad Zaarour, Abbas Zeinedine**, Mohammad Ayache**, Paul Bejjani, François Guerin, Dimitri Lefebvre. 'A Preliminary Study of the Causality of Freezing of Gait for Parkinson's Disease Patients: Bayesian Belief Network Approach', in The 2013 International Conference on Data Mining (DMIN13), Las Vegas Nevada, USA 22th to 25th July 2013. p. 53-57.

43- Iyad Zaarour, Ali Saad, Lilian Sahili, Rani Nassereldine, **Mohammad Ayache**. 'Handwriting and speech prototypes of Parkinson patients: Belief Network Approach', in the IEEE international conference of Sciences of Electronics, Technologies of information and Telecommunications (SETIT). Tunisia, 21th to 24th 2012.

44- Ali Raad, Ali Kalakech, **Mohammad Ayache**, Breast Cancer Classification using artificial neural network, ACIT 2012, Jordan, December 2012.

45- R Elsaleh, M Ayache, AA Nait-Ali, Palm veins biometrics using Radon transform, International Conference on Advances in Biomedical Engineering, 29-34, 2011.

46- Rola el Saleh, **Mohammad Ayache**, Amine Nait Ali: Palm Vein Biometrics Using Radon Transform: RBF Approach, ACIT 2011, pages 76-79, KSA, December 2011.

47- **M.AYACHE**, M.KHALIL, C.PAILLET, F.PERROTIN, F.TRANQUART, RECOGNITION OF PLACENTAL TISSUES USING NEURAL NETWORK, 5TH International Arab Conference on Information Technology, Sana'a, 15-17 December, 2009, page 74 (full paper).

48- Nader Zein, **Mohammad Ayache**, GRAPHICAL USER INTERFACE USING MATLAB FOR ECG DIAGNOSTIC, EURO-MEDITERRANEAN MEDICAL INFORMATICS AND TELEMEDECINE, 5th International Conference, October 16-18, 2009, Hôtel- Dieu de France- Beirut Lebanon, page 59. (Full Paper).

49- Joumana Hajj Hassan, Fatima Haydar, **Mohammad Ayache**, BLADDER VOLUME DETECTOR USING ULTRASOUND METHOD: NON INVASIVE APPROACH, EURO-MEDITERRANEAN MEDICAL INFORMATICS AND TELEMEDECINE, 5th International Conference, October 16-18, 2009, Hôtel- Dieu de France- Beirut Lebanon, page 60. (Full Paper).

50- **M.AYACHE**, M.KHALIL, C.PAILLET, F.PERROTIN, F.TRANQUART, Quantification of Placental Vascularization by Two-Dimensional Power Doppler, Information and Communication Technologies, 2006, ICTTA'06, Volume 1 pages 1140-1144.

51- **M. AYACHE**, M.KHALIL, C.PAILLET, F.PERROTIN, F.TRANQUART: Discrete Wavelet Transform Based on Supervised Training for Classification of Placental tissues. First International Conference of E-Medical systems, October 24-26, 2008, Morocco Fez, pages 188-192.

Research and Scientific Activities

- Co – Chair of the International Conference on Biomedical and Advances Technology ICABME 2025.
- IEEE Lebanon Section Accountant. (2025 -2026)
- IEEE EMBS Lebanon Section Treasurer. (2025-2026)
- IEEE EMBS Lebanon Chapter- Chair. (2021-2024)
- Chair of the International Conference on Biomedical and Advances Technology ICABME 2023.
- Visiting the Career Center at Florida State University, USA, Higher education Capacity Development (HECD) Program, March 2022.
- Chair of the International Conference on Biomedical and Advances Technology ICABME 2021.
- Co – Chair of the International Arab Conference on Information Technology ACIT 2018.
- Participation in many PhD thesis jury members as examiner and Master Thesis jury Member as Reporter and examiner.
- Executive Member in CCIS (Colleges of Computing and Information Society) – Association of Arab Universities.
- Reviewer in different national and international journals and conferences.
- Participation in different workshops concerning quality assurance in education.

- Good experience in QS Ranking and THE Ranking Files preparation and presentation.

Awards and Prizes

- Lira Program 2025 Grant: Ventricular Assist Device Design Improvement: A wireless Approach – for the students Khaled Moussa, Abdel Sattar Hamoudan and Omar Deek, under the supervision of Dr. Mohammad Ayache.
- High Level Scientific Stay Grant has been approved by French Embassy in Lebanon/French Institute in Lebanon for a visit of one week at the university of Lille 1 (France) in June 2023.
- High Level Scientific Stay Grant has been approved by French Embassy in Lebanon/French Institute in Lebanon for a visit of one week at the university of Lille 1 (France) in October 2021.
- German Special Prize is awarded to NAFAS Ventilator – German International Invention Fair – IENA 2021
- Silver Medal is awarded to NAFAS Ventilator – German International Invention Fair – IENA 2021
- IFIA Best Invention Medal is awarded to NAFAS Ventilator - Beirut International Innovation Show 2021
- Gold Medal is awarded to NAFAS Ventilator – Beirut International Innovation Show 2021
- Second Best Paper on the International Conference on Biomedical and Advances Technology ICABME 2021.
- Many Prizes in IEEE Competition, LIRA Program and others.