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Objective

- Pursuing a long-term career in the field of research and development.

Personal information

- Birth date: October 21, 1985
- Gender: Male
- Marital Status: Married
- Nationality: Lebanese

Professional Affiliations:

- **Treasurer, IEEE Computer Society Chapter Lebanon**
January 2023 - 2025
 - Managed financial activities and budgets for the IEEE Computer Society Chapter Lebanon.
 - Oversaw the financial transactions and maintained accurate records.
 - Collaborated with the executive team to plan and execute events and initiatives.
 - Developed strategies to optimize the chapter's financial resources.
 - Represented the chapter in external meetings and conferences.
- **Vice President for Publication, Lebanese Association for Information Systems**
January 2018 – January 2019
 - Held the position of Vice President for Publication within the Lebanese Association for Information Systems.
 - Contributed to the planning and execution of publication-related initiatives and activities.
 - Collaborated with the executive team to enhance the quality and visibility of the association's publications.
- **Delegate, Order of Engineers - Beirut (Elected through elections conducted by the General Syndicate Board)**
September 2022 – 2026
 - Actively participate in the decision-making process regarding the Syndicate's policies and initiatives.
 - Represent the interests of fellow engineers and advocate for their rights and professional development.
 - Collaborate with other Delegates and Syndicate members to address industry challenges and promote the advancement of the engineering sector.
 - Contribute to the development and implementation of programs and activities aimed at enhancing the professional skills and knowledge of engineers.

- Engage in discussions and negotiations with relevant stakeholders to support the Syndicate's objectives and protect the rights of engineers.
- Foster collaboration and cooperation among engineering professionals through networking events, seminars, and conferences.

Patents

- **Smart Infant Cry Analyzer (SICA)**

- Patent Number: 13087
- Issuing Authority: Ministry of Economy and Trade, Directorate General of Economy and Trade, Intellectual Property Protection Office
- Date of Issue: June 10, 2024
- Duration: Valid for 20 years from the date of application
- Description: This invention pertains to the development of an advanced system for analyzing infant cries. The Smart Infant Cry Analyzer (SICA) utilizes innovative technology to distinguish between different types of cries, providing valuable insights for caregivers and healthcare professionals. The system aims to enhance the understanding and response to infant needs, ultimately improving infant care and well-being.

- **Danach - Smart Autism Predictor Machine (D-SAP)**

- Patent Number: 13228
- Issuing Authority: Ministry of Economy and Trade, Directorate General of Economy and Trade, Intellectual Property Protection Office
- Date of Issue: March 20, 2025
- Duration: Valid for 20 years from the date of application
- Description: This invention involves the development of a predictive machine for autism detection, leveraging advanced technology to identify early signs of autism and assist in timely intervention and diagnosis.

- **Danach – Smart Parkinson Predictor Machine (D-SPP Machine)**

- Patent Number: 13521
- Issuing Authority: Ministry of Economy and Trade, Directorate General of Economy and Trade, Intellectual Property Protection Office
- Date of Issue: February 10, 2026
- Duration: Valid for 20 years from the date of application
- Description: An AI-based predictive system designed to detect early indicators of Parkinson's disease through intelligent pattern analysis and machine learning modeling.

Education

- Postdoctoral researcher in Business Analytics at Université d'Artois, Bethune- France, from November 2020 till December 2021.
- PhD in Computer and telecommunication engineering from Ecole Centrale de Lille– France, December 2016.
- Master II in Big Data Analytics from ISAE (le CNAM Liban), expected to certify June 2026.
- Master II in Network engineer from Islamic University of Lebanon year 2014.
- Master II in Management Information System (MIS) from Islamic University of Lebanon year 2013.
- Bachelor (Bacc+5) of Engineering in Computer and Telecommunication Engineering from Islamic university in June 2008.

About The Thesis (2013-2016): Hyperheuristics in Logistics (A Novel approach of Artificial Intelligence in Logistics)

Success in using exact methods for large scale combinatorial optimization is still limited to certain problems or to specific classes of instances of problems. The alternative way is either using metaheuristics or matheuristics that rely on exact methods in some ways. In the context of combinatorial optimization, we are interested in heuristics to choose heuristics invoked to solve the addressed problem. In this thesis, we focus on hyperheuristic optimization in logistic problems. We focus on proposing a hyperheuristic framework that carries out a search in the space of heuristic algorithms and learns how to change the incumbent heuristic in a systematic way along the process in such a way that a good sequence of heuristics produces high quality solutions. We propose HHs for two problems in logistics: the workover rig scheduling problem and the hub location routing problem. Then, we compare the performances of several HHs described in the literature for the latter problem, which embed different heuristic selection methods such as a random selection, a choice function, a Q-Learning approach, and an ant colony based algorithm. The computational results prove the efficiency of HHs for the two 2 problems in hand, and the relevance of including Lagrangian relaxation information for the second problem.

About The Post-doctoral Research (2020-2021): Socorro: Seeking out corrosion - before it is too late

This project aims to provide companies with an independent means to assess the corrosion risks in their installations, to increase their awareness and to have them take appropriate preventive actions. To this end, we created a simple, rapid, in situ sensor system able to monitor a range of environmental markers over time to determine the risk of corrosion of steel submerged in water, as well as a statistical method to mine these data for an overall corrosion risk estimate – in short, the SOCORRO system, set at TRL 4. In this project, we were implement and demonstrate this whole set-up in several industrial case studies (wind turbines at sea, water desalination/sanitation, ship's hulls and ballast tanks, harbour sheet piles, process water) and show the economic opportunities. In addition, we will augment the statistical analysis with an intuitive, practical dashboard tool to present the outflow of information and to convey that risk to the end users.

Journal Articles

- 1- **Danach, K.**, Haddad, S., Aly, W. H. F., Kallab, C., & Sayah, J. (2026). Energy-Aware Hub Location via Reinforcement Learning and Thermodynamic Optimization. *IEEE Open Journal of Intelligent Transportation Systems*.
- 2- **Danach, K.**, Aly, W. H. F., & Riman, C. F. (2026). Infection Aware Hyper-Heuristic Framework for Hospital Room–Patient Matching. *Algorithms*, 19(3), 205.
- 3- Rammal, A., Assaf, R., & **Danach, K.** (2026). Digital Dewaxing of Raman Hyperspectral Images: Application to Paraffin-Embedded Skin Biopsies. *Journal of Raman Spectroscopy*.
- 4- **Danach, K.**, Hamze, K., Harb, H., & Kanj, H. (2026). Carbon-Aware Scheduling in Cloud Computing Operations: A Multi-Objective Optimisation Approach. *IET Smart Grid*, 9(1), e70056.
- 5- **Danach, K.**, Rkein, H., Ramadan, A., Harb, H., & Hamdar, B. (2026). AI-powered hub optimization: a reinforcement learning and graph-based approach to scalable blockchain networks. *IAES International Journal of Artificial Intelligence (IJ-AI)*, 536-546.
- 6- **Danach, K.**, Harb, H., Issa, H., & Saker, L. (2026). An Explainable Data-Driven Optimization Framework for Industrial Predictive Maintenance Scheduling. *Results in Engineering*, 109022.
- 7- **Danach, K.**, Raad, A., & Nasser, A. (2025). Multi-Modal Last-Mile Delivery Optimization With Smart Micro-Hubs: A Branch-and-Price Approach With Valid Inequalities. *IEEE Open Journal of Intelligent Transportation Systems*, 6, 1596-1611.
- 8- Harb, H., Al Tfaily, F., **Danach, K.**, Hazimeh, H., & Jaber, A. (2025). MOTION: Multi-models correlation framework for energy-saving in wireless video sensor networks. *Computers and Electrical Engineering*, 128, 110720.

- 9- **Danach, K.**, Harb, H., & Issa, H. (2025). A hyper-heuristic optimization and communication framework for sustainable agricultural decision-making: A case study on Lebanese farms. *Journal of Agriculture and Food Research*, 102522.
- 10- **Danach, K.**, Aly, W. H. F., Tarhini, A., & Laouadi, S. (2025). Toward Transparent Optimization: A Systematic Review of Explainable AI in Decision-Making Systems. *European Journal of Pure and Applied Mathematics*, 18(4), 6707-6707.
- 11- **Danach, K.**, Tarhini, A., Aly, W. H. F., & Hejase, H. J. (2025). A Multi-Level Optimization Framework for Blockchain Security: Integrating Metaheuristics, Reinforcement Learning, and Game Theory. *European Journal of Pure and Applied Mathematics*, 18(4), 6555-6555.
- 12- **Danach, K.**, Harb, H., Ramadan, A., & Haddad, S. (2025). Enhancing Multi-Criteria Decision-Making in Blockchain Security: A Hybrid Machine Learning and PROMETHEE Approach. *Engineering Research Express*.
- 13- Harb, H., Al Tfaily, F., **Danach, K.**, Hazimeh, H., & Jaber, A. (2025). MOTION: Multi-models correlation framework for energy-saving in wireless video sensor networks. *Computers and Electrical Engineering*, 128, 110720.
- 14- Eledlebi K, Khoury D, Haddad S, Sondi P, Mun H, **Danach K**, Sayah J, Damiani E, Yeun CY. Innovative Integration of GBA and Hybrid TESLA for Securing IoT Authentication in 5G and 6G Networks. *IEEE Access*. 2025 Oct 10.
- 15- **Danach, K.**, & Aly, W. H. F. (2025). Adaptive Hyperheuristic Framework for Hyperparameter Tuning: A Q-Learning-Based Heuristic Selection Approach with Simulated Annealing Acceptance Criteria. *European Journal of Pure and Applied Mathematics*, 18(3), 6348-6348.
- 16- **Danach, K.**, Aly, W. H. F., & Haddad, S. (2025). Mathematical Modeling and Genetic Algorithm-Based Hyperheuristic Optimization for Quality of Service and Load Balancing in Cloud Communication Networks. *European Journal of Pure and Applied Mathematics*, 18(3), 6487-6487.
- 17- **Danach, K.**, Harb, H., Hejase, H. J., & Saker, L. (2025). A Hybrid Metaheuristic Framework with Reinforcement Learning–Based Heuristic Selection for Large-Scale Combinatorial Optimization. *European Journal of Pure and Applied Mathematics*, 18(3), 6602-6602.
- 18- **Danach, K.**, Harb, H., Amine, S., & Belhor, M. (2025). NeuHH: A Neuromorphic-Inspired Hyper-Heuristic Framework for Solving the Capacitated Single-Allocation p-Hub Location Routing Problem. *Vehicles*, 7(2), 61.
- 19- **Danach, K.**, Harb, H., Hejase, H. J., & Saker, L. (2025). A Hybrid Metaheuristic Framework with Reinforcement Learning–Based Heuristic Selection for Large-Scale Combinatorial

- Optimization. *European Journal of Pure and Applied Mathematics*, 18(3), 6602-6602.
- 20- Harb, H., **Danach, K.**, AlAkkoumi, M., Jaber, A., Abou Jaoude, C., & Nasser, A. (2025). Cluster or Tree? Toward a Hybrid Topology for Sensor Networks. *Results in Engineering*, 105823.
 - 21- **Danach, K.**, Aly, W. H. F., & Haddad, S. (2025). Mathematical Modeling and Genetic Algorithm-Based Hyperheuristic Optimization for Quality of Service and Load Balancing in Cloud Communication Networks. *European Journal of Pure and Applied Mathematics*, 18(3), 6487-6487.
 - 22- **Danach, K.**, Harb, H., Saker, L., & Raad, A. (2025). Quantum-Inspired Hyperheuristic Framework for Solving Dynamic Multi-Objective Combinatorial Problems in Disaster Logistics. *World Electric Vehicle Journal*, 16(6), 310.
 - 23- **Danach, K.**, & Aly, W. H. F. (2025). Adaptive Hyperheuristic Framework for Hyperparameter Tuning: A Q-Learning-Based Heuristic Selection Approach with Simulated Annealing Acceptance Criteria. *European Journal of Pure and Applied Mathematics*, 18(3), 6348-6348.
 - 24- **Danach, K.**, Saker, L., & Harb, H. (2025). Integrating metaheuristics and machine learning for enhanced vehicle routing: A comparative study of hyperheuristic and VAE-based approaches. *World Electric Vehicle Journal*.
 - 25- **Danach, K.**, Aly, W. H. F., & Kanj, H. (2025). Machine learning for smart grid stability: Enhancing reliability in renewable energy integration. *European Journal of Pure and Applied Mathematics*, 18(2), 5953–5953.
 - 26- Al-Tarawneh, M., Al-Khresheh, A., Al-irr, O., Kulaglic, A., **Danach, K.**, Kanj, H., (2025). Towards accurate fake news detection: Evaluating machine learning approaches and feature selection strategies. *European Journal of Pure and Applied Mathematics*, 18(2), 6087–6087.
 - 27- **Danach, K.**, Harb, H., Aly, W. H. F., Kanj, H., & Rashid, A. S. K. (2025). Bio-inspired optimization through photosynthesis: A novel approach for balancing exploration and exploitation in complex systems. *European Journal of Pure and Applied Mathematics*, 18(2), 5980–5980.
 - 28- **Danach, K.**, Harb, H., Baz, B., & Nasser, A. (2025). A hyperheuristic approach to multi-echelon hub and routing optimization: Model, valid inequalities, and case study. *IEEE Open Journal of Intelligent Transportation Systems*.
 - 29- **Danach, K.**, Rammal, A., Moukadem, I., Harb, H., & Nasser, A. (2025). Advanced optimization in e-commerce logistics: Combining matheuristics with random forests for hub location efficiency. *IEEE Access*.
 - 30- **Danach, K.**, Harb, H., Rashid, A. S. K., Al-Tarawneh, M. A. B., & Aly, W. H. F. (2025). Location planning techniques for Internet provider service unmanned aerial vehicles during crisis. *Results in Engineering*, 25, 103833.

- 31- Khoury, D., Haddad, S., Sondi, P., Balian, P., Harb, H., **Danach, K.**, Merhej, J. CoAP/DTLS protocols in IoT based on blockchain light certificate. *Internet of Things (IoT)*, 6(1).
- 32- **Danach, K.**, El Dirani, A., & Rkein, H. (2024). Revolutionizing Supply Chain Management with AI: A Path to Efficiency and Sustainability. *IEEE Access*.
- 33- **Danach, K.**; Khalaf, A.H.; Rammal, A.; Harb, H. Enhancing DDBMS Performance through RFO-SVM Optimized Data Fragmentation: A Strategic Approach to Machine Learning Enhanced Systems. *Appl. Sci.* 2024, 14, 6093. <https://doi.org/10.3390/app14146093>
- 34- **Danach, K.**, Gelareh, S., and Monemi, R., (2019). The Capacitated Single Allocation p-Hub Location Routing Problem: A Lagrangian Relaxation and a Hyper-heuristic Approach. *EURO Journal on Transportation and Logistics*.
- 35- **Danach, K.**, & Moukadem, I. (2024). Enhanced Optimization of Heat Exchanger Systems Using the Branch and Cut Method: A Case Study in Industrial Thermodynamics. *Letters in High Energy Physics*, 2024, 256-267.
- 36- **Danach, K.**, Kanj, H., Hamze, K., & Moukadem, I. (2024). Optimizing learning-based combinatorial optimization algorithms: Advanced hyperparameter techniques and real-world applications. *Nanotechnology Perceptions*, 20(S15), 2996–3017. <https://nanotnp.com/index.php/nano/article/view/4434>
- 37- **Danach K.** (2024). Enhanced Hub Location Routing with Branch-and-Cut Methods and Simplified Mathematical Models. *International Journal on Recent and Innovation Trends in Computing and Communication*, 12(2), 699–705. Retrieved from <https://ijritcc.org/index.php/ijritcc/article/view/11037>
- 38- **Danach, K.**, Ghandour, M., Hamdar, B., & Fayad, N. (2024). Revolutionizing the Economic Landscape: A Comprehensive Framework for Leveraging Generative AI in Economic Analysis and Decision Making. *Tuijin Jishu/Journal of Propulsion Technology*, 3375-3386.
- 39- **Danach, K.** (2024). Reinforcement Learning for Dynamic Vehicle Routing Problem: A Case Study with Real-World Scenarios. *International Journal of Communication Networks and Information Security (IJCNIS)*, 16(3), 580–589. Retrieved from <https://www.ijcnis.org/index.php/ijcnis/article/view/7013>
- 40- Rkein H., **Danach K.**, & Rachini A. (2024). Decentralized Finance (DeFi) Risk Management Using Explainable AI and Blockchain Transparency. *Journal of Computational Analysis and Applications (JoCAAA)*, 33(4), 1–12. Retrieved from <https://www.eudoxuspress.com/index.php/pub/article/view/422>
- 41- Z. AlZamili, **Danach K.** and M. Frikha, (2023) "Deep Learning-Based Patch-Wise Illumination Estimation for Enhanced Multi-Exposure Fusion," in *IEEE Access*, doi: 10.1109/ACCESS.2023.3328579.

- 42- Tarhini, A., **Danach, K.**, Harfouche A., (2020) String Swarm Intelligence-based Hyperheuristic for Solving the Vehicle Routing Problem with Prioritized Customers, *annals of operations research*.
- 43- Monemi, R., **Danach, K.**, Khalil, W., Gelareh, S., Lima, F., and Aloise, D. (2015). Solution methods for scheduling of heterogeneous parallel machines applied to the workover rig problem. *Expert Systems with Applications*, 42, 4493--4505.
- 44- Monemi, R. N., Gelareh, S., Nagih, A., Maculan, N., & **Danach, K.** (2021). Multi-period hub location problem with serial demands: A case study of humanitarian aids distribution in Lebanon. *Transportation Research Part E: Logistics and Transportation Review*, 149, 102201.
- 45- AlZamli, Z., **Danach, K.**, & Frikha, M. (2022). Concepts and Techniques of MultiExposure Image Fusion: A Literature. *Design Engineering*, 4208 - 4217.
- 46- Hejase, H. J., Fayyad-Kazan, H., Hejase, A. J., Moukadem, I., & **Danach, K.** (2023). Needed MIS Competencies to the Job Market: Students' Perspective. *British Journal of Multidisciplinary and Advanced Studies*, 4(5), 120-162.
- 47- Danach, K., Hejase, H. J., Faroukh, A., Fayyad-Kazan, H., & Moukadem, I. (2024). Assessing the Impact of Blockchain Technology on Financial Reporting and Audit Practices. *Asian Business Research*, 9(1), 30.
- 48- Bashir, E., Hejase, H. J., **Danach, K.**, Fayyad-Kazan, H., & Hejase, A. J (2022). An Assessment of Students' Preferences Using Social Media Platforms on Their Selection of Private Universities in Lebanon. *Journal of Business Theory and Practice* Vol. 10, No. 3.
- 49- Baydoun, A., **Danach, K.**, & Hassan, J. A. H. A (2021). COMPUTERIZED KNOWLEDGE SHARING FRAMEWORK FOR THE SUPPLY CHAIN DEVELOPMENT PHASES. *International Journal of Engineering Applied Sciences and Technology*.
- 50- **Danach, K.**, Baydoun, A., Al-Haj Hassan, J., & Tarhini, A. (2022). Mobile clinics routing in response to covid-19 outbreak: an intelligent hyperheuristic approach. *International Journal of Engineering Applied Sciences and Technology*.
- 51- Mohammmd, D. M., & Danach, K. (2023). Enhancing Fraud Detection in Financial Transactions: A Comparative Analysis of Machine Learning Algorithms. *European Journal of Interdisciplinary Research and Development*.
- 52- Danach , K., & Hassan, J. A.-H. (2023). Elevating Organizational Competitiveness: Deconstruction of Information System Management Models and Concepts Using Machine Learning. *Journal of Scientific Research and Reports*, 29(10), 104–112. <https://doi.org/10.9734/jsrr/2023/v29i101802>
- 53- Bashir, E., Hejase, H., Danach, K., Yassin, W., & Hejase, A. (2024). An Assessment of the University Usage of Social Media Platforms: Case from Lebanon—Analytics—Part 2. *Journal of Business Theory and Practice*.
- 54- Ibraheem, B., Danach, K., & Ghandour, A. (2024). Colorization of Black and White Images Using a Hybrid Deep Learning Framework. *International Research Journal of Innovations in Engineering & Technology*, 6-11.

- 55- Mahdi , Z., Danach , K. & Hamade , M. (2024). Exploring the Evolution and Future Trends of Image Style Transfer Techniques: A Comprehensive Literature Review. International Research Journal of Innovations in Engineering and Technology - IRJIET.
- 56- Rkein , H., Danach , K., El Dirani, A. & Abbas , F. (2024). Redefining Financial Standards: Addressing the Accounting Challenges of Cryptocurrencies with a Blockchain Framework. International Research Journal of Innovations in Engineering and Technology - IRJIET.

Books (Under Review)

- 1- Danach, K., Fayyad-Kazan, H., & Hejase, H. (under publication, Dar Sader). *Mastering Python: A comprehensive guide to programming with examples and exercises.*
- 2- Danach, K., & Hejase, H. (under review). *A practical guide to metaheuristics, matheuristics, and hyperheuristics with real-world applications and code examples.*

Conference Articles

- 1- **Danach, K.**, Fayyad-Kazan, H., Khalil, W., Haddad, S., Sayah, J. (2026). Adaptive Hyper-Heuristics for Smart Logistics Optimization. In: Trabelsi, M., Khan, M., Boudia, Z., Murugappan, M. (eds) Proceedings of the 2nd Symposium on Smart, Sustainable, and Secure Internet of Things. S4IoT 2025. Lecture Notes in Electrical Engineering, vol 1513. Springer, Singapore. https://doi.org/10.1007/978-981-95-5136-1_7
- 2- Danach, K., Al Haj Hassan, J., & Raad, A. (2026). Quantum-Inspired Hub Location Framework for Drug–Target Interaction Networks. IISEC. Ankara: IEEE.
- 3- **Danach, K.**, Hassan, J. A. H., & Belhor, M. (2026, February). Compound Knowledge Hyper-Heuristic for Large-Scale Network Design Problems. In *ROADEF 2026*.
- 4- **Danach, K.**, S. Haddad, J. Merhej, I. Jawhar, C. Kallab and J. Sayah, "Real-Time Hyper-Heuristic Control for Decentralized Edge Logistics: A Reinforcement Learning Approach," *2025 International Symposium on Networks, Computers and Communications (ISNCC)*, Paris, France, 2025, pp. 1-7, doi: 10.1109/ISNCC66965.2025.11250464
- 5- Khashman, M. S., Hameed, I. A., & **Danach, K. M.** (2025, May). Iterative spherical Hamerly's algorithm clustering based on cosine similarity and harmony search optimization. In AIP Conference Proceedings (Vol. 3211, No. 1, p. 030029). AIP Publishing LLC.
- 6- **Danach, K.**, Ghandour, M., & Hamdar, B. (2024). Leveraging Blockchain Technology for Securing and Verifying Educational Certificates. ICTO. Paris.
- 7- **Danach, K.**, Hamdar, B., & Al Dirani, A. (2024). Data-Driven Hyperheuristics for Hub Location Optimization: Transforming Logistics. ROADEF. Amiens.
- 8- Tarraf, R., & **Danach, K.** (2024). Optimizing Prioritized Vehicle Routing: A Tailored Approach with a Modified Clarke-Wright Algorithm Emphasizing Route Time and Customer Priority. ROADEF. Amiens.
- 9- Alzamili, Z., Danach, K., & Frikha, M. (2024). Advancements in Multi-Exposure Image Fusion: Exploring Cutting-Edge Concepts and Techniques. *5th International Scientific Conference of Alkafeel University*. Al-Najaf Al-Ashraf, IRAQ.
- 10- Alzamili, Z., **Danach, K.**, & Frikha, M. (2024). Revolutionizing COVID-19 Diagnosis: Advancements in Chest X-ray Analysis through Customized Convolutional Neural Networks and Image Fusion Data Augmentation. In *BIO Web of Conferences* (Vol. 97, p. 00014). EDP Sciences.
- 11- **Danach, K.**, & Dirani, A. (2023). Navigating HR 4.0: Harnessing AI for Ethical and Inclusive HR Transformation. *AUCOB*. Kuwait.
- 12- Khashman, M., Hameed, I., & **Danach, K.** (2023). Iterative Spherical Hamerly's Algorithm Clustering based on Cosine Similarity and Harmony Search Optimization. IRCEAS. Bagdad.

- 13- Alzamli, Z., **Danach, K.**, & Frikha, M. (2022). Machine Learning Techniques in Service of COVID-19: Data Augmentation Based on Multi-Exposure Image. 4th International Conference on Current Research Engineering and Science Applications 2022. IEEE.
- 14- Tarhini, A., **Danach, K.**, Harfouche A., (2019) String Swarm Intelligence-based Hyperheuristic for Solving the Vehicle Routing Problem with Prioritized Customers. ICTO. Paris.
- 15- Fneish, M., Sbeity, I., & **Danach, K.** (2019). Machine Learning Techniques for Fraud Detection: Case study on Credit Cards' Transactions Dataset. AISD. Beirut.
- 16- Gelareh, S., **Danach, K.**, Monemi, R. N., & Nagih, A. (2019). Humanitarian Aids Distribution Network Design Problem: A case study. AISD. Beirut (**Best Paper Award**).
- 17- **Danach, K.**, Khalil, W., Fawaz, M., Noura, Hassan (2018). Hierarchical Hub Location Center Single Assignment: A Facility Network Design for NGOs in Lebanon. *ROADEF*. Lorient, France.
- 18- **Danach, K.**, Tarhini, A. (2018). Data Mining Methods Based Hyperheuristic Approach for Schedule Plan to Higher Relief Council. *EURO 29*. Valencia, Spain .
- 19- Gelareh, S., Monemi, R., **Danach, K.**, (2017). Network Design, Fleet Deployment and Empty Repositioning in Liner Shipping. LCIS. Beirut, Lebanon (**Best Paper Award**).
- 20- **Danach, K.**, Tarhini, A., Haj Hassan, J., (2017). L'APPLICATION DE LA FOUILLE DE DONNEES POUR LA LUTTE CONTRE LE TERRORISME: CAS DES APPELS TELEPHONIQUES AU LIBAN. LCIS. Beirut, Lebanon.
- 21- **Danach, K.**, Al Haj Hassan, J., & Tarhini, A. (2016). Mobile hospital routing for prioritized patients: an intelligent variable neighbourhood approach. *ICTO*. France.
- 22- **Danach, K.**, Gelareh, S., Khalil, W., Semet, F (2016). Mobile hospital routing for prioritized patients: an intelligent variable neighbourhood approach. *EWGLA*. Malaga, Spain.
- 23- Tarhini, A., **Danach, K.**, Shour, A, (2016). The Vehicle Routing Problem with picked-up delivery: a heuristic approach. 28th European Conference on Operational Research. Pozan, Poland.
- 24- **Danach, K.**, Gelareh, S., Khalil, W., Monemi, R. N., Semet, F (2016). Capacitated Single Allocation p-Hub Location Problem: Hyperheuristic Approaches with different Selection Methods. *ROADEF*. Compiegne, France.
- 25- **Danach, K.**, Khalil, W., Gelareh, S., Tarhini, A, (2016). Metaheuristic vs Reinforcement Learning Based Hyperheuristic applied to Capacitated Single Allocation p-Hub Location Problem. *LCIS*. Beirut, Lebanon.
- 26- **Danach, K.**, & Al-Haj Hassan, J. (2016). Clinical Decision Support System with Routing Heterogeneous Mobile Hospitals: A Data Mining and A Hyperheuristic approaches. *TORS*. Sousse, Tunisia.
- 27- **Danach, K.**, Khalil, W., Gelareh, S., Semet, F., & Junior, F. (2015). Capacitated Single location P-Hub Location Routing : Hyper-heuristic Approach. *ROADEF*. Marseille, France.

- 28- Monemi, R., **Danach, K.**, Gelareh, S., & Khalil, W., (2015). Solution methods for scheduling of heterogeneous parallel machines applied to the workover rig problem. 8th International Conference of the Iranian Society of Operations Research, Ferdowsi University of Mashhad, May, 2015.
- 29- **Danach, K.**, Khalil, W., & Gelareh, S. (2015). Multiple Strings Planing Problem in Maritime Service Network: Hyper-Heuristic Approach. *TAECE*. Beirut, Lebanon.
- 30- Shour, A., **Danach, K.**, W., & Tarhini, A. (2015). Modified Clarke Wright algorithms for solving the Realistic Vehicle Routing Problem. *TAECE*. Beirut, Lebanon.
- 31- **Danach, K.**, Haj Hassan, J., Khalil, W., Gelareh, S., & Kalakish, A. (2015). Routing Heterogeneous Mobile Hospital With Different Patients Priorities: Hyper-Heuristic Approach. *DICTAP*. Beirut, Lebanon.
- 32- **Danach, K. M.**, Khalil, W., Junior, F., & Gelareh, S. (2014). Routing parallel heterogeneous machines in maintenance planning: A hyper-heuristic approach. *ICCSA*, (p. 441). Le Havre, France.
- 33- **Danach, K.**, Khalil, W., & Gelareh, S. (2014). Hyper-heuristic Applied to Maritime Service Network. *IFORS*. Barcelona, Spain.

Curriculum Development and Course Design

- **Course Creator and Designer**, Islamic University of Lebanon (IUL)
 - **AI Fundamentals for Computer Science Students** (2021): Developed and designed a foundational course covering key artificial intelligence concepts, applications, and tools, tailored to undergraduate computer science curricula.
 - **System Analysis and Design for Management Information Systems Students** (2019): Designed and implemented a practical, industry-relevant course focusing on systems development life cycle, modeling techniques, and project-based learning for MIS students.

Conference Activities

International Conference on Computers and Industrial Engineering (CIE45), Metz, France:

- Session Co-chair for "Hub and Spoke in Land and Maritime Transport" (2015)

ECCS 2022, Vienna, Austria:

- Member of the Scientific Committee (2022)

ICCTA 2019, Istanbul, Turkey:

- Member of the Scientific Committee (2019)

Lebanese Conference on Information Systems (LCIS), Beirut, Lebanon:

- Session Co-chair for "Heuristic Methods for Combinatorial Problems" (2016)
- Track Co-chair for "L'innovation: Savoir-faire et savoir agir complexe" (2016)
- Member of the Scientific Committee (2016)
- Member of the Organizing Committee (2017)

Reviewing

- Reviewer for several conferences and scientific journal, including(IEEE Intelligent Transportation Systems Transactions, International Journal of Services and Standards (IJSS), Journal of Decision Systems, ICTO, ICCTA)

Research Interests

- 1- Operational Research
- 2- Business Analytics
- 3- Scheduling and Routing problem
- 4- Logistics and Supply chain
- 5- Heuristics, Meta-heuristic, math-heuristic and hyper-heuristic
- 6- Optimization

Work Experience

Al Maaref University

September 2023 – Present

- **Chairperson of Information Technology and Management Systems Department**
 - Leading the department in academic and administrative matters.
 - Overseeing curriculum development and faculty management.
 - Driving research initiatives and collaborations.
 - Ensuring quality education and continuous improvement.

Université d'Artois

November 2020 – December 2021

Postdoctoral Researcher

Islamic University Of Lebanon

November 2020 – 2023

Head of Computer Science Department

November 2018 – November 2020

Head of Management Information System Department

October 2011 – 2014

Full time Lecturer at Faculty of Economics and Business Administration

December 2014 - November 2018

Coordinator of Management Information System Department (Tyr branch)

TTO-Lebanon

June 2015 – February 2017

General Manager and Co-Founder

Danach Co – Saida

June 2008 – Mars 2009

Network engineer and Developer

CUBICWIN/Edumotion/ASD/Global Golden/Rainbow training centers

January 2017 – Present

Trainer (Data Science, Programming, ICDL, Digital Marketing, AI, Analytics, etc.)

Operational Research Soft Skills

Solver (Excel Add-ins) – Hyflex (Java Platform) – GIIHH (Java Platform) – CPLEX (under JAVA)

Programming Skills

VB .Net – C# .Net – ADO .Net – ASP.Net – Labview – Python - Advanced C – Advanced JAVA – JSP – Assembly – Prolog – Matlab

Data Analytics Skills

R language - Keras Python – TensorFlow Python – Orange data mining – RapidMiner – Weka – SPSS -

Data Visualization Skills

Ms. Power BI – Tableau – Matplotlib python - Google Analytics

Database Administration Skills

Microsoft SQL server, MySQL

Online Teaching Skills

Microsoft Teams – Zoom – Edmodo – OBS – Blogger - MindMap

Teaching**Al Maaref University****2023 – Present**

- 1- Human Resources Information System
- 2- Enterprise Resource Planning
- 3- Introduction to Python
- 4- Visual Programming
- 5- Database

Al Balamand University**2025– 2026**

- 1- Artificial Intelligence

Islamic University of Lebanon**2009 - 2023**

- 1- Artificial Intelligence (Post Graduate Program)
- 2- Data Mining (Post Graduate Program)
- 3- Advanced Database (Post Graduate Program)
- 4- Network (French & English sections).
- 5- Computer Application.
- 6- Visual Programming (VB and C#. Net)/ Java 1/ Object Oriented Programing
- 7- Software engineering
- 8- Algorithmic and Data structure.
- 9- Web programming
- 10- Database
- 11- Management Information System
- 12- Network

International Lebanese University**2022 – 2024**

- 1- Intermediate Programming with Object
- 2- Digital Logic
- 3- Computer Science Overview
- 4- Advanced Database (Post Graduate Program)
- 5- Computer Architecture
- 6- Design and Analysis of Algorithm (Post Graduate Program)
- 7- Concepts of Programming Languages
- 8- Data Structures and Algorithms
- 9- Internetworking and Routing Protocols

Le CNAM - Beirut**2023– 2024**

- 1- Programmation Java : programmation objet
- 2- Ouverture au monde du numérique
- 3- Programmation web : Coté Serveur (php)

Lebanese University

2023– Present

- 1- Machine Learning
- 2- Advanced Data Security

AMERICAN UNIVERSITY OF SCIENCE & TECHNOLOGY**2023– 2024**

- 1- Computer Network

Supervision Experience:**PhD Student Supervisor, Safax University, Tunisia (2020 - 2024)**

Zeinab Al-Zamli:

- Guided Zeinab throughout her research on "Using Machine Learning for Multi-Exposure Image Enhancement."
- Collaborated with Zeinab to develop a comprehensive research plan and select suitable machine learning algorithms to enhance the quality of multi-exposure images.
- Reviewed Zeinab's research methodology, providing constructive feedback for improvement.
- Assisted Zeinab in analyzing data and interpreting research findings.
- Co-authored research papers with Zeinab and supported her in presenting her work at conferences.

Master Student Supervisor, Islamic University of Lebanon, Lebanon (2018 - 2024)

- Supervised multiple Master's students specializing in optimization and machine learning.
- Provided guidance and mentorship to students throughout their research projects.
- Supported students in developing research proposals and selecting appropriate methodologies in the field of optimization and machine learning.
- Reviewed and provided feedback on their experimental designs, data analysis, and interpretation of results.

Languages

- Arabic , French , English

References

- Dr. Abbas Tarhini (Associate Professor at Lebanese American University):
mobile 03967276 – email: abbas.tarhini@lau.edu.lb.
- Dr. Wissam Khalil (Head of Management Information System Department at Faculty of economics and business administration in Islamic University Of Lebanon mobile: 03 980 819, email: wissam.khalil@iul.edu.lb
- Dr. Genan Youness (Head of Statistics Department Le CNAM, Lebanon, mobile: 009613 658083, email: genane.youness@lecnam.net

Documents are upon your request.