CURRICULUM VITAE

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Measures	# Pub.	# Citations	h-index	link
Publons	153	2023	24	https://publons.com/researcher/2132188/mohammed-azmi-al-betar/
Scopus	153	3111	29	https://www.scopus.com/authid/detail.uri?authorId=57202908939
Google Scholar	179	4505	35	https://scholar.google.com/citations?user=24O7a0wAAAAJ&hl=en
Research gate	194	4,046	33	https://www.researchgate.net/profile/Mohammed-Al-Betar
ORICID	https://orcid.org/0000-0003-1980-1791			
LinkedIn	https://www.linkedin.com/in/mohmmed-al-betar-53760653/			
DBLP	https://dblp.org/pid/90/7990.html			

Short bibliography

Dr. Mohammed Azmi Al-Betar has received his PhD in Artificial Intelligence, 2010 from University of Science Malaysia. He was also haired as a postdoctoral research fellow in the same university for 3 years and invited as a visiting researcher two times. He is currently the Head of Artificial Intelligence Research Center (AIRC) and full time faculty member in the Master of Artificial Intelligence (MSAI) program at Ajman University since 2020. He is also the MSAI coordinator at Ajman University. He is also the Head of the Evolutionary Computation Research Group (ECRG) which publish more than 180 scientific publications in high quality and well-reputed journals and conferences. Therefore, Dr. Al-Betar ranked in Stanford study of the world's top 2% of scientists. Dr. Al-Betar has 15+ year teaching experience in the higher education institutions. He has taught several courses in the Computer science and Artificial Intelligence fields. Prior to join Ajman University, Dr. Al-Betar served as the Deputy Dean of the Academic Affair, Deputy Dean of Scientific Research for Quality Assurance and Development , and the Head of Information Technology Department at Al-Balqa Applied University, Jordan. In addition to his research, teaching and administrative capabilities, Dr. Al-Betar has special strength in developing the web-based applications which build more than 12 academic web systems related to research, quality assurance, e-learning, and postgraduate sections.

Personal Particulars

- My main specialist is in Artificial Intelligence, Machine Learning, Data Sciences, Data Mining, Big data, Machine Learning, Deep Learning, Robotics, Evolutionary computing, Game Theory, Modelling.
- I have a strong experience in timetabling, optimization, combinatorial optimization problem, and metaheuristic methods such as genetic algorithm, harmony search, artificial bee colony, ant colony optimization, etc.
- I have introduced new metaheuristic methods such as β-hill climbing optimizer and Coronavirus herd immunity optimizer
- I have Strong experience in technical writing, mathematical modelling, articles and lectures presentations, teaching.
- I have a strong capabilities of using research tools such as latex on Winedit, MikteX, Matlap, Python Photoshop, open office, etc.
- I am a distinguished web application developers using PHP, MYSQL, JavaScript, JQUERY, CSS, HTML5 web programming languages under Laravel, CodeIgniter and its own framework.
- I have an excellent communication and organization skills.
- I can effectively solve the problem with ability to handle multiple tasks simultaneously.
- I have the proper experience in leading academic and research positions since I was the deputy dean of scientific research, deputy dean of academic affair.
- I am the leader of machine learning research group at University Sains Malaysia.
- I have supervised 16 PhD students (past and present) and many master students.

Qualifications

- **Ph.D.**, School of computer Sciences, UNIVERSITY SAINS MALAYSIA, June 2007 until Oct. 2010.
    1. Thesis Topic: *Adapting and Hybridising Harmony Search with Metaheuristic Components for* ***University Course Timetabling***
    2. Adviser: **Prof. Ahmad Tajudin Khader**
    3. Area of Study: Optimization, Timetabling, Artificial Intelligence
- **M.Sc**., Computer Science Department, YARMOUK UNIVERSITY, Nov. 2001 (till Sept. 2003) Program: Mixed Mode (Courses and Final Project)
    1. Thesis Topic: *A Genetic-base Algorithm for solving the* ***University Course timetabling***
    2. Adviser: Associate Professor Dr. **Mohammad Hamdan**
    3. Area of Study: Timetabling, Optimization
    4. Grade: 81.7 Very Good
- **B.Sc.,** Computer Science Department, YARMOUK UNIVERSITY, Nov. 1997 (till Sept. 2001)**.**

Work Experience

1. **Associate Professor at Ajman University, U.A.E. From 23/08/2020 until NOW.** I am the Coordinator for Master of Artificial Intelligence Program and a Head of Artificial intelligence Research Center at Ajman University. I thought a Master Degree Level Courses such as Data mining, Advanced AI, Machine Learning, and Evolutionary Computations.

2. **Deputy Dean of Academic Affair:** Deputy Dean of Academic Affair (DDAA) , Al-Hoson University College, Al-Balqa' Applied University, Irbid, Jordan. From 15/09/2019 until now. Al-Hoson University College is an engineering branch at al-Balqa applied university containing 8000 students distributed over 12 bachelor program, 1 Master program, and 14 3-years diploma programs. I was responsible for academic staff, lecturing, academic issues in the collage, the research applications and the promotion applications of the academic staffs. Research management, and internal and external projects. Also, the master student proposals and thesis.

3. **Assistant Dean of Scientific Research**: Deanship of Scientific Research (DSR) at Al-Balqa' Applied University (46000 student and 1800 faculty members) , Al-Salt, Jordan. From 15/09/2018 until 15/09/2019. I have the responsibility of managing and controlling the conference support systems, sabbatical system, research management, and internal and external projects.

4. **Associate professor:** Department of Information Technology, Al-Huson University College, Al-Balqa Applied University, P.O. Box 50, Al-Huson, Irbid, Jordan, 15-Sept. 2017 Until Now.
   - The work is just initiated. Four courses will be taught as follows:
     - Artificial Intelligence
     - Expert Systems
     - Software Engineering
     - Special Topics
     - Neural Network and Genetic Algorithms
5. **Assistance professor:** Department of Information Technology, Al-Huson University College, Al-Balqa Applied University, P.O. Box 50, Al-Huson, Irbid, Jordan, 15-Sept. 2013 Until 15/09/2017.
   - The work is just initiated. Four courses will be taught as follows:
     - Artificial Intelligence
     - Expert Systems
     - Software Engineering
     - Special Topics
     - Neural Network and Genetic Algorithms
     - Programming languages (C++)
     - Final year project.
     - Computer Skill 2 (Visual Basic)

6. **Assistance professor:** JADARA UNIVERSITY, Computer Science Department, Information Science College, Irbid, Jordan, 11-Sept. 2012 until 10/09/2013.
   - The work is just initiated. Four courses will be taught as follows:
     - Operating system
     - Programming languages (C++)
     - System Analysis and Design.
     - Final year project.
     - Computer Skills

7. **Visiting Researcher:** UNIVERSITI SAINS MALAYSIA (University of Science, Malaysia), School of Computer Sciences, Penang, Malaysia, 15-June-2012 to 15-September-2012.
   - Conduced a research titled "Enhancing Hajj Performance: Novel Crowd management system and Reduction of Related Health Problem" with a project subtitle "Enhancing modeling of Pilgrims during Hajj".
   - Presented a workshop about Optimization research the first one titled "**A Modern Optimization Method: Harmony Search**", 9-August-2012. 10:00 am—12:00 am.
   - Attend a workshop titled "INVITATION TO STRATEGIC MAPPING WORKSHOP OF HAJJ LRGS RESEARCH", Date: August 4, 2012 (Saturday), Time: 9.30 am - 8.00 pm, Venue: The Hydro Hotel, Penang. I am a Co-Researcher in this research grant.
   - Attend the computer science postgraduate colloquium 2012 titled "Smart Research", Date: July 16-17, 2012 , Venue: DK A, DK B, DK C. I did some evaluation for some posters.
8. **Assistance professor:** ALZYTOONAH UNIVERSITY OF JORDAN, Department of Computer Science, Science and Information Technology Faculty, Amman, Jordan (27-November-2010 until 11-September-2012)
   - Developed and prepared lectures, graded assignments, projects, and exams for the following undergraduate courses:
     1. Data analysis and design
     2. Discrete mathematics
     3. Object oriented analysis and design
     4. Artificial Intelligence
     5. System Programming
     6. Operation Research
     7. Computer Skills
9. **Post Doctoral Research Fellow:** UNIVERSITI SAINS MALAYSIA (University of Science, Malaysia), School of Computer Sciences, Penang, Malaysia, 15-June-2011 to 15-June-2012.
   - During the postdoctoral appointments, the following activates have been established:
     - Conducted and Published a number of high impact factored journals, international conferences, and book chapters in a well-reputed publishers like IEEE, Elsevier, Springer, Taylor& Francis, Inderscience, IGI Global, and ACM (as shown in publication section)
     - Official Co-supervised Ph.D and master students.
10. **Lecturer:** JERASH PRIVATE UNIVERSITY, Department of Computer Science, Science and agriculture college, Jerash, Jordan,(1st October, 2003 until 1st October 2007). during which I taught the following courses:
    1. Introduction to Computer Skills
    2. Introduction to Compiler Construction
    3. Computer Architecture
    4. Visual Basic Programming
    5. Data Communication and Computer Network
    6. C++ programming (initial and advanced level)
    7. Software Engineering
    8. System Software: an introduction to system programming
    9. Introduction to Internet

10. Data structure
11. Computer Algorithm

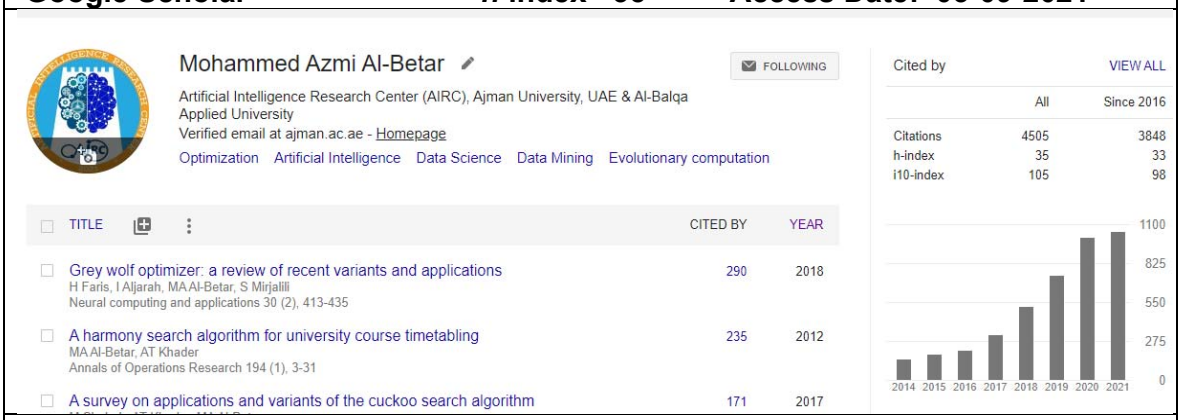
11. **Teacher:** UNITED NATIONS RELIEF AND WORKS AGENCY(UNRWA) 2002 to 2003
12. **Teacher:** MINISTRY OF EDUCATION, Jordan 2001 to 2002.

Research Interests

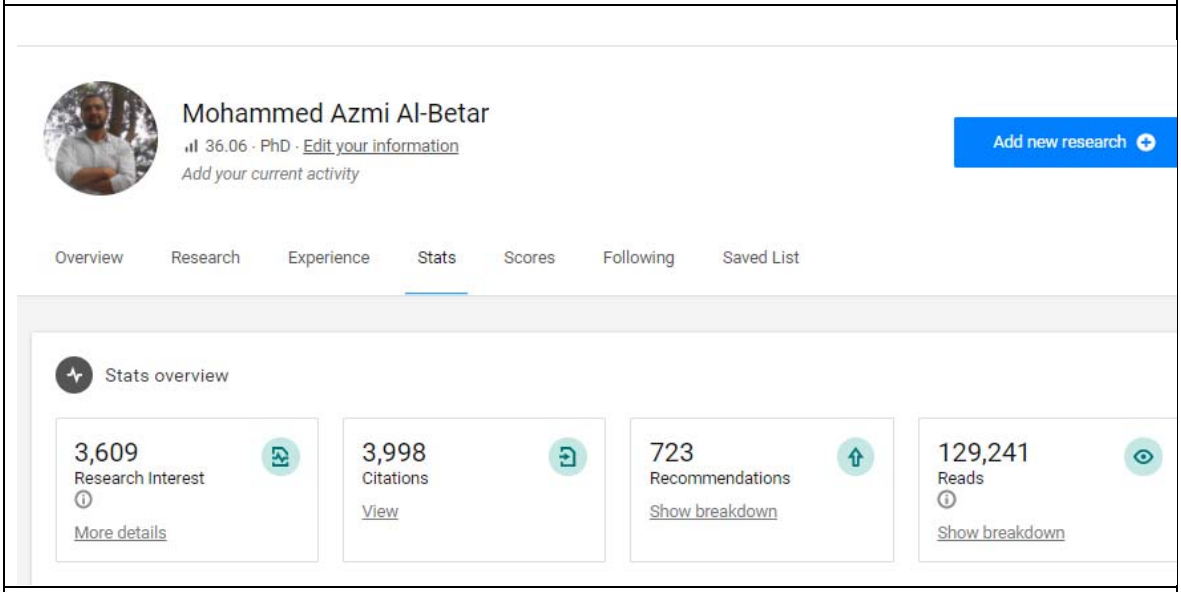
Artificial Intelligence, Machine learning, Data Science, Data Mining, Big Data, Smart City, Deep Learning, Robotics, Crowed Simulation, Operation Research Problems, Scheduling and Timetabling, Optimization Algorithms, Combinatorial Problems , Game theory, Discrete mathematics, Modeling and design, Web Accessibility .

Main Scientific Measures

Google Scholar ***h*** **index =35** **Access Date: 03-09-2021**



ResearchGate Scholar ***h*** **index =34** **Access Date: 03-09-2021**



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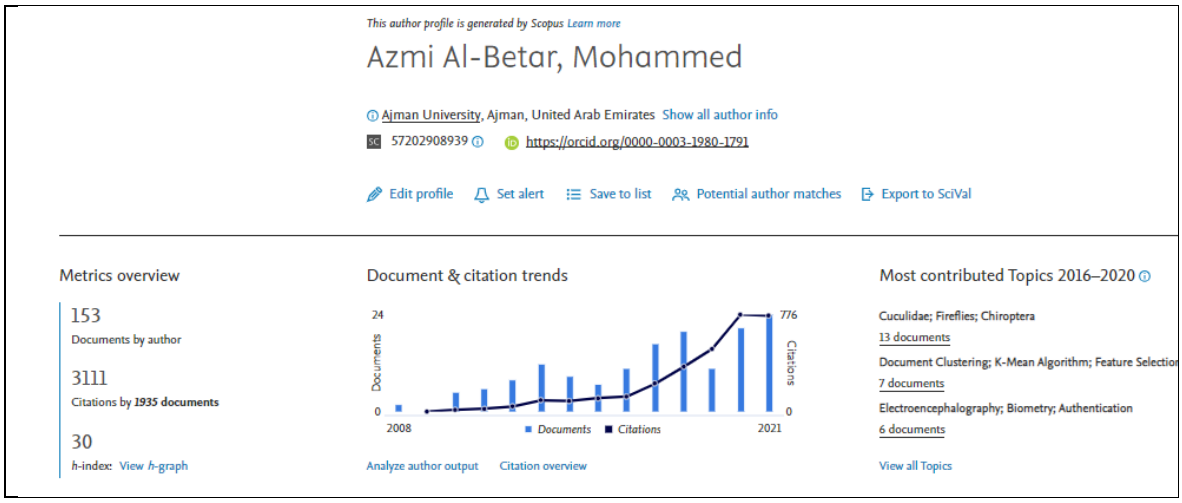

Publications

Dissertation:

- **Mohammed Azmi Al-Betar** (2010). Adapting and Hybridizing Harmony Search with Metaheuristic Components for University Course Timetabling, UNIVERSITI SAINS MALAYSIA, School of Computer Sciences, Penang, Malaysia, .

A. Scopus, SCI,SCIE, Thomson Impact Factor Articles

2021

1. Al-Betar, M. A., Hammouri, A. I., Awadallah, M. A., & Doush, I. A. (2020). Binary $$\beta $$ β-hill climbing optimizer with S-shape transfer function for feature selection. Journal of Ambient Intelligence and Humanized Computing, 1-29. Doi: 10.1007/s12652-020-02484-z. (Q1).

2. Abdalkareem, Z. A., Amir, A., Al-Betar, M. A., Ekhan, P., & Hammouri, A. I. (2021). Healthcare scheduling in optimization context: a review. *Health and Technology*, 1-25. Doi: 10.1007/s12553-021-00547-5. (Q4).

3. Al-Betar, M. A., Alyasseri, Z. A. A., Awadallah, M. A., & Doush, I. A. (2021). Coronavirus herd immunity optimizer (CHIO). *Neural Computing and Applications*, *33*(10), 5011-5042. Doi: 10.1007/s00521-020-05296-6. (Q2).

4. Al-Betar, M. A., Awadallah, M. A., Heidari, A. A., Chen, H., Al-Khraisat, H., & Li, C. (2021). Survival exploration strategies for harris hawks optimizer. *Expert Systems with Applications*, *168*, 114243. Doi: 10.1016/j.eswa.2020.114243. (Q1).

5. Makhadmeh, S. N., Khader, A. T., Al-Betar, M. A., Naim, S., Abasi, A. K., & Alyasseri, Z. A. A. (2021). A novel hybrid grey wolf optimizer with min-conflict algorithm for power scheduling problem in a smart home. *Swarm and Evolutionary Computation*, *60*, 100793. Doi: 10.1016/j.swevo.2020.100793. (Q1).

6. Abasi, A. K., Khader, A. T., Al-Betar, M. A., Naim, S., Alyasseri, Z. A. A., & Makhadmeh, S. N. (2021). An ensemble topic extraction approach based on optimization clusters using hybrid multi-verse optimizer for scientific publications. *Journal of Ambient Intelligence and Humanized Computing*, *12*(2), 2765-2801. Doi: 10.1007/s12652-020-02439-4. (Q1).

7. Al-Betar, M. A. (2021). Island-Based Harmony Search Algorithm for Non-convex Economic Load Dispatch Problems. *Journal of Electrical Engineering & Technology*, 1-31. Doi: 10.1007/s42835-021-00758-w. (Q3)

8. Kassaymeh, S., Abdullah, S., Al-Betar, M. A., & Alweshah, M. (2021). Salp swarm optimizer for modeling the software fault prediction problem. *Journal of King Saud University-Computer and Information Sciences*. Doi: 10.1016/j.jksuci.2021.01.015. (Q1).

9. Kassaymeh, S., Abdullah, S., Al-Laham, M., Alweshah, M., Al-Betar, M. A., & Othman, Z. (2021). Salp Swarm Optimizer for Modeling Software Reliability Prediction Problems. Neural Processing Letters, 1-37. Doi: 10.1007/s11063-021-10607-6. (Q1).

10. Almomani, A., Al-Nawasrah, A., Alauthman, M., Al-Betar, M. A., & Meziane, F. (2021). Botnet detection used fast-flux technique, based on adaptive dynamic evolving spiking neural network algorithm. *International Journal of Ad Hoc and Ubiquitous Computing*, *36*(1), 50-65. Doi: 10.1504/IJAHUC.2021.112981. (Q4).

11. Abasi, A. K., Khader, A. T., Al-Betar, M. A., Naim, S., Makhadmeh, S. N., & Alyasseri, Z. A. A. (2021). A novel ensemble statistical topic extraction method for scientific publications based on optimization clustering. *Multimedia Tools and Applications*, *80*(1), 37-82. Doi: 10.1007/s11042-020-09504-2. (Q1).

12. Awadallah, M. A., Al-Betar, M. A., Hammouri, A. I., & Alomari, O. A. (2020). Binary JAYA algorithm with adaptive mutation for feature selection. *Arabian Journal for Science and Engineering*, *45*(12), 10875-10890. Doi: 10.1007/s13369-020-04871-2. (Q2).

13. Alyasseri, Z. A. A., Al-Betar, M. A., Doush, I. A., Awadallah, M. A., Abasi, A. K., Makhadmeh, S. N., ... & Zitar, R. A. Review on COVID-19 diagnosis models based on machine learning and deep learning approaches. *Expert Systems*, e12759. Doi: 10.1111/exsy.12759. (Q3).

14. Aldeeb, B. A., Al-Betar, M. A., Norwawi, N. M., Alissa, K. A., Alsmadi, M. K., Hazaymeh, A. A., & Alzaqebah, M. (2021). Hybrid intelligent water Drops algorithm for examination timetabling problem. *Journal of King Saud University-Computer and Information Sciences*. Doi: 10.1016/j.jksuci.2021.06.016. (Q1).

15. Ja'afar, S., Tubishat, M., Idris, M., Al-Betar, M. A., Alswaitti, M., Jarrah, H., Ismail, M. A., & Omar, M. S. (2021). Improved Sine Cosine Algorithm with Simulated Annealing and Singer Chaotic Map for Hadith Classification. *Neural Computing and Applications*. (**Accepted**).

16. Al-Betar, M. A., Alyasseri, Z. A. A., Doush, I. A., Abasi, A. K., ... & Zitar, R. A. (2021). Gene selection for microarray data classification based on Gray Wolf Optimizer enhanced with TRIZ-inspired operators. Knowledge-Based Systems, 223, 107034. Doi: 10.1016/j.knosys.2021.107034. (Q1)

17. Makhadmeh, S. N., Al-Betar, M. A., Alyasseri, Z. A. A., Abasi, A. K., Khader, A. T., Damaševičius, R., ... & Abdulkareem, K. H. (2021). Smart Home Battery for the Multi-Objective Power Scheduling Problem in a Smart Home Using Grey Wolf Optimizer. *Electronics*, *10*(4), 447. 10.3390/electronics10040447. (Q2).

18. Alkoffash, M. S., Awadallah, M. A., Alweshah, M., Zitar, R. A., Assaleh, K., & Al-Betar, M. A. (2021). A Non-convex Economic Load Dispatch Using Hybrid Salp Swarm Algorithm. Arabian Journal for Science and Engineering, 1-20. DOI: 10.1007/s13369-021-05646-z. (Q2).

19. Alyasseri, Z. A. A., Al-Betar, M. A., Awadallah, M. A., Makhadmeh, S. N., Abasi, A. K., Doush, I. A., & Alomari, O. A. (2021). A Hybrid Flower Pollination with β-Hill Climbing Algorithm for Global Optimization. *Journal of King Saud University-Computer and Information Sciences*. Doi: 10.1016/j.jksuci.2021.06.015. (Q1).

20. Zitar, R. A., Al-Betar, M. A., Awadallah, M. A., Doush, I. A., & Assaleh, K. (2021). An Intensive and Comprehensive Overview of JAYA Algorithm, its Versions and Applications. *Archives of Computational Methods in Engineering*, 1-30. Doi: 10.1007/s11831-021-09585-8. (Q1).

21. Dalbah, L. M., Al-Betar, M. A., Awadallah, M. A., & Zitar, R. A. (2021). A modified coronavirus herd immunity optimizer for capacitated vehicle routing problem. Journal of King Saud University-Computer and Information Sciences. Doi: 10.1016/j.jksuci.2021.06.013. (Q1).

2020

22. MA Awadallah, MA Al-Betar, AI Hammouri, OA Alomari.(2020) Binary JAYA Algorithm with Adaptive Mutation for Feature Selection Arabian Journal for Science and Engineering, 1-16
23. MA Al-Betar, AI Hammouri, MA Awadallah, IA Doush (2020) Binary β -hill climbing optimizer with S-shape transfer function for feature selection Journal of Ambient Intelligence and Humanized Computing, 1-29
24. AK Abasi, AT Khader, MA Al-Betar, S Naim, SN Makhadmeh (2020) A novel ensemble statistical topic extraction method for scientific publications based on optimization clustering Multimedia Tools and Applications, 1-46
25. AI Hammouri, M Mafarja, MA Al-Betar, MA Awadallah, I Abu-Doush (2020) An improved Dragonfly Algorithm for feature selection Knowledge-Based Systems 203, 106131
26. AK Abasi, AT Khader, MA Al-Betar, S Naim, ZAA Alyasseri (2020). An ensemble topic extraction approach based on optimization clusters using hybrid multi-verse optimizer for scientific publications . Journal of Ambient Intelligence and Humanized Computing, 1-37
27. M Alweshah, S Al Khalaileh, BB Gupta, A Almomani, AI Hammouri (2020).The monarch butterfly optimization algorithm for solving feature selection problems. Neural Computing and Applications, 1-15

28. ZAA Alyasseri, AT Khader, MA Al-Betar, OA Alomari.(2020) Person Identification using EEG Channel Selection with Hybrid Flower Pollination Algorithm Pattern Recognition, 107393
29. MA Awadallah, MA Al-Betar, AL Bolaji, IA Doush, AI Hammouri, M Mafarja (2020). Island artificial bee colony for global optimization. Soft Computing, 1-27
30. AK Abasi, AT Khader, MA Al-Betar, S Naim, SN Makhadmeh Link-based multi-verse optimizer for text documents clustering, Applied Soft Computing 87, 106002

31. SN Makhadmeh, AT Khader, MA Al-Betar, S Naim, ZAA Alyasseri(2020) A min-conflict algorithm for power scheduling problem in a smart home using battery. Proceedings of the 11th National Technical Seminar on Unmanned System
32. MA Al-Betar, Z Abdi, A Alyasseri, A Mohammed , (2020) Coronavirus herd immunity optimizer (CHIO). Neural Computing and Applications, 10.1007/s00521-020-05296-6
33. MA Al-Betar (2020) A β-hill climbing optimizer for examination timetabling problem Journal of Ambient Intelligence and Humanized Computing
34. AK Abasi, AT Khader, MA Al-Betar, S Naim, ZAA Alyasseri, (2020) A novel hybrid multi-verse optimizer with K-means for text documents clustering, Neural Computing and Applications
35. IA Doush, WB Alrashdan, MA Al-Betar, MA Awadallah , (2020) Community detection in complex networks using multi-objective bat algorithm, International Journal of Mathematical Modelling and Numerical Optimisation
36. MA Al-Betar, OA Alomari, SM Abu-Romman, A TRIZ-inspired bat algorithm for gene selection in cancer classification Genomics 112 (1), 114-126
37. MA Al-Betar, MA Awadallah, AA Heidari, H Chen, H Al-khraisat, C Li , (2020) Survival Exploration Strategies for Harris Hawks Optimizer, Expert Systems with Applications, 114243
38. IA Doush, I Damaj, MA Al-Betar, MA Awadallah, M Ra'ed, AE Alchalabi , (2020) A Survey on Accessible Context-Aware Systems , Technological Trends in Improved Mobility of the Visually Impaired, 29-63

2019

39. ZAA Alyasseri, AT Khader, MA Al-Betar, AK Abasi, SN Makhadmeh.(2020) EEG signals denoising using optimal wavelet transform hybridized with efficient metaheuristic methods IEEE Access
40. Iyad Abu Doush, Mohammed Azmi Al-Betar, Mohammed A Awadallah, Eugene Santos, Abdelaziz I Hammouri, Majdi Mafarjeh, Zainab AlMeraj (2019). Flow shop scheduling with blocking using modified harmony search algorithm with neighboring heuristics methods. Applied Soft Computing. 10586, https://doi.org/10.1016/j.asoc.2019.105861
41. M Alweshah, A Al-Daradkeh, MA Al-Betar, A Almomani, S Oqeili, (2019). β-Hill climbing algorithm with probabilistic neural network for classification problems. Journal of Ambient Intelligence and Humanized Computing, 1-12, https://doi.org/10.1007/s1265
42. MA Al-Betar, OA Alomari, SM Abu-Romman (2019), A TRIZ-inspired bat algorithm for gene selection in cancer classification, Genomics, https://doi.org/10.1016/j.ygeno.2019.09.015

43. SN Makhadmeh, AT Khader, MA Al-Betar, S Naim, AK Abasi (2019) Optimization methods for power scheduling problems in smart home: Survey, Renewable and Sustainable Energy Reviews 115, 109362. Elsevier (Impact Factor: 10.55)
44. MA Awadallah, MA Al-Betar, AL Bolaji, EM Alsukhni, H Al-Zoubi (2019), Natural selection methods for artificial bee colony with new versions of onlooker bee, Soft Computing 23 (15), 6455-6494, Springer
45. MA Al-Betar, MA Awadallah, MM Krishan, A non-convex economic load dispatch problem with valve loading effect using a hybrid grey wolf optimizer, Neural Computing and Applications, 1-28, https://doi.org/10.1007/s00521-019-04284-9. Springer
46. MA Al-Betar, MA Awadallah, IA Doush, AI Hammouri, M Mafarja (2019), Island flower pollination algorithm for global optimization, The Journal of Supercomputing, 75(8): pp 5280–5323.
47. MA Al-Betar, I Aljarah, MA Awadallah, H Faris, S Mirjalili (2019), Adaptive β-hill climbing for optimization, Soft Computing, 23(24): 13489–13512 Springer
48. QM Alzubi, M Anbar, ZNM Alqattan, MA Al-Betar, R Abdullah (2019),Intrusion detection system based on a modified binary grey wolf optimisation, Neural Computing and Applications, 1-13, https://doi.org/10.1007/s00521-019-04103-1
49. SN Makhadmeh, AT Khader, MA Al-Betar, S Naim (2019) Multi-objective power scheduling problem in smart homes using grey wolf optimiser. Journal of Ambient Intelligence and Humanized Computing 10 (9), 3643-3667

2018

50. Zaid Abdi Alkareem Alyasseri, Ahamad Tajudin Khader, Mohammed Azmi Al-Betar, João P Papa, Osama Ahmad Alomari (2018). EEG feature extraction for person identification using wavelet decomposition and multi-objective flower pollination algorithm. IEEE Access. 6: 76007-76024
51. MA Al-Betar, MA Awadallah, H Faris, I Aljarah, AI Hammouri (2018) Natural selection methods for grey wolf optimizer, Expert Systems with Applications 113, 481-498
52. Lahasan, Badr and Lutfi, Syaheerah Lebai and Venkat, Ibrahim and Al-Betar, Mohammed Azmi and San-Segundo, Ruben, 2018,"***Optimized symmetric partial facegraphs for face recognition in adverse conditions***",Information Sciences,429:194-214,Elsevier
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54. Faris, Hossam and Aljarah, Ibrahim and Al-Betar, Mohammed Azmi and Mirjalili, Seyedali, 2017,"***Grey wolf optimizer: a review of recent variants and applications***",Neural Computing and Applications, 30 (2), 413-435,Springer London
55. Alsalibi, Ahmed Izzat and Mittal, Sparsh and Al-Betar, Mohammed Azmi and Sumari, Putra Bin, 2018,"***A survey of techniques for architecting SLC/MLC/TLC hybrid Flash memory--based SSDs***",Concurrency and Computation: Practice and Experience, 30 (13), e4420,
56. Alijla, Basem O and Lim, Chee Peng and Wong, Li-Pei and Khader, Ahamad Tajudin and Al-Betar, Mohammed Azmi, 2018,"***An ensemble of intelligent water drop algorithm for feature selection optimization problem***",Applied Soft Computing,65:531-541,Elsevier
57. MA Al-Betar, MA Awadallah, IA Doush, E Alsukhni, H ALkhraisat (2018) A Non-convex Economic Dispatch Problem with Valve Loading Effect Using a New Modified β-

Hill Climbing Local Search Algorithm. Arabian Journal for Science and Engineering 43 (12), 7439-7456

58. Al-Betar, Mohammed Azmi and Awadallah, Mohammed A, 2018,"***Island bat algorithm for optimization***",Expert Systems with Applications,107:126-145,Pergamon
59. Al-Betar, Mohammed Azmi and Awadallah, Mohammed A and Faris, Hossam and Yang, Xin-She and Khader, Ahamad Tajudin and Alomari, Osama Ahmad, 2018,"***Bat-inspired algorithms with natural selection mechanisms for global optimization***",Neurocomputing,273:448-465,
60. Alomari, Osama Ahmad and Khader, Ahamad Tajudin and Al-Betar, Mohammed Azmi and Awadallah, Mohammed A, 2018,"***A novel gene selection method using modified MRMR and hybrid bat-inspired algorithm with β-hill climbing***",Applied Intelligence, 48 (11), 4429-4447,Springer US
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50. **Mohammed Azmi Al-Betar**, Khader, A.T., Thomas, J. J. (2010).: *A Combination of Metaheuristic Components based on Harmony Search for The Uncapacitated Examination Timetabling*. In: 8th International Conference on the Practice and Theory of Automated Timetabling (PATAT 2010), Belfast, Northern Ireland, August 10–13

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Web Applications Development Systems

1. Promotion system at Al-Balqa Applied University (BAU). I have participated in developing the promotion system (prom.bau.edu.jo)

2. E-learning management system at Al-Balqa Applied University. I build up this system during COVID-19 stage to track the lecturing and examinations activities of 1600 staff members.
3. Research portal at Al-Balqa Applied University. (dsr.bau.edu.jo)
4. Scholar Gate at Al-Balqa Applied University. (scholar.bau.edu.jo)
5. Conference application system at Al-Balqa Applied University(prom.bau.edu.jo).
6. Sabbatical application system at Al-Balqa Applied University (prom.bau.edu.jo).
7. Internal project support system at Al-Balqa Applied University (prom.bau.edu.jo).
8. University Course Timetabling System at University Sains Malaysia
9. University Examination Timetabling system at University Sains Malaysia
10. Distance Education Timetabling system at University Sains Malaysia

Awards

- Top 2% scholar in the world according to Stanford University, USA
- Al-Balqa Applied University, Highly cited researcher, 2018
- University Sains Malaysia, High Impact Publications. Award Malaysia, in 2014,2013,2012,2011,2010
- Full PhD Fellowship for 3 years, Malaysia.
- University Sains Malaysia, Best Thesis award, 2010

National and International Projects

- **CO-Researcher in "Enhancing Hajj Performance: Novel Crowd management system and Reduction of Related Health Problem" with a project subtitle "Enhancing modeling of Pilgrims during Hajj". Funded by Malaysian Ministry of Higher Education. (2012), 9000,000 Ringgit.**
- **Principle Investigator of project title " A TRIZ-Inspired Bat Algorithm for Gene Selection in Cancer Classification" Funded by Deanship of scientific research (DSR) at Al-Balqa Applied University. 5000 JOD.**

Editorship and Refereeing Activities

1. I am a Reviewer in **Information Science** Journal under Elsevier Publisher.
2. I am a Reviewer in **Europe Journal of Operation Research** Journal under Elsevier Publisher.
3. I am a Reviewer in **Applied Soft Computing Journal** under Elsevier Publisher.
4. I am a Reviewer in **Applied Mathematics and Computation** Journal under Elsevier Publisher.
5. I am a Reviewer in **Advances in Engineering Software** Journal under Elsevier Publisher.
6. I am a Reviewer in **Indian Journal of Science and Technology** Journal.
7. I am a Reviewer in **International Journal of Digital Content Technology and its Applications (JDCTA**) published by **AICIT** (Advanced Institute of Convergence Information Technology). And many more…

8. Supervision of PHD Students

#	Name	Nationality	Degree	Univ.	Grad. year	email
1	Mohammed A. Awadallah	Palestinian	PHD	USM	2014	ma.awadallah@alaqsa.edu.ps
	Thesis title: Enhanced Harmony Search Algorithm for Nurse Rostering Problem					
2	Bolaji Asaju La'aro	Nigerian	PHD	USM	2013	lbasaju@fuwukari.edu.ng
	Thesis title: ARTIFICIAL BEE COLONY TECHNIQUES FOR UNIVERSITY TIMETABLING PROBLEMS					
3	Zaid Abdi Alkareem Alyasseri	Iraqi	PHD	USM	2020	zaid.alyasseri@uokufa.edu.iq
	Thesis title: BIOMETRIC USER AUTHENTICATION SYSTEM BASED ON ELECTROENCEPHALOGRAM SIGNALS					
4	Osama Ahmad Alomari	Turkish	PHD	USM	2018	oalomari@gelisim.edu.tr
	Thesis title: FILTER-WRAPPER METHODS FOR GENE SELECTION AND CANCER CLASSIFICATION					
5	Ting Yee Lim	China	PHD	USM	2015	tylim1@wou.edu.my
	Thesis title: PAIR BONDS IN GENETIC ALGORITHM					
6	Bisan Alsalibi	Palestinian	PHD	USM	2016	besansalipi@gmail.com
	Thesis title: Membrane-Inspired Bat Algorithm For Feature Selection To Recognize Faces In Unconstrained Scenarios					
7	Laith Mohammad Abualigah	Jordanian	PHD	USM	2018	lahdyabat@aau.edu.jo
	Thesis title: Feature selection and enhanced krill herd algorithm for text document clustering					
8	Khairul Bin Anwar	Malaysian	PHD	USM	2017	khair274@sabah.uitm.edu.my
	Thesis title: HARMONY SEARCH-BASED HYPER-HEURISTIC FOR SCHEDULING PROBLEMS					
9	Sharif Naser Makhadmeh	Jordanian	PHD	USM	Still	m_shareef_cs@yahoo.com
	Thesis title: Smart Home Battery for Multi-objective Power Scheduling Problem in a Smart Home Using Grey Wolf Optimizer					
10	Ammar Abasi	Jordanian	PHD	USM	2020	ammar_abasi@student.usm.my
	Thesis title:TEXT DOCUMENT CLUSTERING USING MULTI-VERSE OPTIMIZER ALGORITHM FOR ENHANCED UNSUPERVISED SCIENTIFIC PUBLICATIONS TOPIC EXTRACTION					
11	Adewole Kayode Sakariyah	Nigerian	PHD	USM	Still	
	Thesis title: Development and Evaluation of multi agent based intelligent Fround and information leakage detection system in online social network					
12	Omer Khair Alla Alidmat	Jordanian	PHD	USM	Still	
	Thesis title: Still not recognized					
13	Zahraa Adnan Abdal-Kareem	Iraqi	PHD	UTP	Still	zahraa2010@yahoo.com
	Thesis title: FLOWER POLLINATION ALGORITHM FORSOLVING PATIENT ADMISSION SCHEDULINGPROBLEM					
14	Bashar Al-deeb	Jordanian	PHD	USIM	2019	baaldeeb@iau.edu.sa
	Thesis title: HYBRID INTELLIGENT WATER DROPS ALGORITHM FOR UNIVERSITY EXAMINATION TIMETABLING PROBLEM WITH IMPROVED CONVERGENCE BEHAVIOR					
15	Sofian Kassaymeh	Jordanian	PHD	UKM	Still	samsaak@gmail.com
	Thesis title: Salp Swarm Optimizer for Modeling SoftwareReliability Using Various Testing and Efforts Prediction					

Skills and Achievements

1. LATEX using Win-edit
2. Matlap
3. Open Office
4. Microsoft Office
5. linux (Red hat)and windows Operating System
6. Visual Basic 6 and .net
7. Visual C++
8. Micromedia Flash 5
9. All third Generation languages Like Basic, Pascal, Fortaran,C++, Prolog etc.
10. Oracle 8i
11. HTML,php,sql, css, jquery, etc.
12. Front Page
13. SPSS 16,17,18
14. Mini-Lap
15.GSview 4.4
16. Java
17. C#
18.python

Languages

1. **Arabic** : Mother Language.
2. **English** : Excellent command writing, reading and speaking.
3. **Bahasa Malayu** : good command writing, reading and speaking.

Names/affiliation and contact details potential referees

	Name	affiliation	Position	email
1	Prof. Dr. Ahamad Tajudin Khader	University sains Malaysia, 11800, Penang, Malaysia	The Dean of the school of computer sciences	tajudin@usm.my
2	Associate Prof. Dr. belal zagibeh	Jadara Univesity, 733, Irbid Jordan	The head of computer center	belal@jadara.edu.jo
3	Associate Prof. Dr. Iyad Abu Doush	Yarmouk University, Irbid, Jordan	The Head of computer science dept.	iyad.doush@yu.edu.jo
4	Prof. Dr. Rosni Abdullah	University sains Malaysia, 11800, Penang, Malaysia	Professor at school of computer sciences	rosin@usm.my