Baker Khaldoun Abdalhaq

I am a computer science researcher and professor with significant experience in computer programming and systems analysis and management. I have both experience in professional work and academia. Soft computing is my main research area. for the last two decades my research focus has been Meta-Heuristic Optimization algorithms.

Summary of Publications

h-index **9** *google scholar*

publications **23**

Place of Birth

July 27, 1970 **Nablus, Palestine**.

Languages

Arabic **Mother tongue**

English **Fluent**

Spanish **Fluent**

Education

2004 **PhD, Computer Science**, *Universitat Autònoma de Barcelona*, Spain, dissertation title: "A methodology to enhance the prediction of forest fire propagation".
www.uab.es

2002 **MS, Computer Science**, *Universitat Autònoma de Barcelona*, Spain.
www.uab.es

1999 **Non-degree study, MBA coursework with honors**, *An-Najah National University*, Palestine.
www.najah.edu

1994 **BSc, Computer Science with honors**, *Princess Sumaya University for Technology*, Jordan.
www.psut.edu.jo

Identifiers

ORCiD **https://orcid.org/0000-0002-9101-4955**

An-Najah National University – P.O. Box 707 Nablus, Palestine
☎ *+970 0599674265* • ✉ *baker@najah.edu* • ✉ *baker.abdalhaq@gmail.com*

Scopus Author ID **6506853448**

Web of Science Researcher **ID Y-1261-2019**

Research Interests

Machine Learning.

Meta-Heuristic Optimization Techniques.

Research Grants

2021 **Visiting scholar to Colorado University at Boulder**, funded by Fulbright.
During my visit I worked on developing machine learning techniques to be used in LHC at CERN.

2020 **Reversible Logic Synthesis Optimization**, *reference:ANN-1920-Sc006*, funded by An-Najah National University.
Developing fast reversible logic synthesis framework using meta-heuristic optimization techniques

Research Projects

2002 **FOREMMS: Forest Environment Monitoring and Management**.
To develop and demonstrate an advanced forest environmental monitoring and management system prototype.

2002 **GRID**.
I have participated in administration of the GRID in UAB-Spain during my stay there.

2001 **SPREAD**.
A research project supported by the European Commission under the Fifth Framework Program within the Energy, Environment and Sustainable Development. Contract EVG1-2001-00043.

Professional Work

2004–present **Assistant Professor**, *An-Najah National University*, Nablus, Palestine, www.najah.edu.

- Teaching courses
- Advising students
- Supervising graduate projects
- Supervising master theses
- Participating in curricula development
- Member of CIS department committee
- Member of Advanced computing program committee
- Reviewing research papers

2012–2013 **Dean Faculty of Information Technology**, *An-Najah National University*, Nablus, Palestine.

- Managing and developing curricula
- Managing and recruitment of faculty members (evaluation, promotion, etc.)
- University strategic plan development

2005–2012 **Head of CIS department at Faculty of IT**, *An-Najah National University*, Nablus, Palestine.

- Managing and developing curricula
- Managing and recruitment of faculty members (evaluation, promotion, etc.)
- University strategic plan development

1994–1999 **Programmer/Analyst**, *An-Najah National University*, Nablus, Palestine.

Projects: Library management system, Students Information System, Payroll, Inventory, Accounting, Personnel

- Analysis, design and implementation of MIS
- Database Administration and tuning
- OS Administration (VMS, UNIX, Linux)
- Participated in many committees for computer HW and SW procurement

Committees

Faculty of engineering and IT strategic planning committee.

University IT policy.

E-learning committee.

Procurement committees.

University Hospital Information system consultation committee.

Teaching Experience

Master's Courses

- **Heuristic Optimization Techniques**
- **Modeling and simulation (Advanced computing)**
- **Simulation models (Engineering Management)**
- **Software Project Management (Engineering Management)**
- **Programming for advanced computing Master's students**

Bachelor's courses

- **Heuristic Optimization Techniques**
- **Principles of Scientific Research**
- **Compilers**
- **AI**
- **Data Science Tools(special topics)**
- **Simulation**
- **Programming Languages Concepts**
- **Computer Graphics**
- **Operating systems**
- **Algorithms**
- **Data Mining**
- **Report writing**
- **Object-Oriented Analyses and design**
- **Internet Programming**
- **System Development using 4gl**
- **Information Retrieval Systems**
- **User Interface Design and Programming**
- **Software Project Management**
- **Information System Infrastructure**
- **Decision support systems**
- **Decision Analyses**
- **Project Management**
- **Database Management Systems**
- **Database Administration**
- **Introduction to programming**
- **Graduation project**

Supervision of Master's Thesis

2020 **"Algorithms of Optimization Techniques for Bin Packing Problems: A comparative study"**, *Yasmeen Karmy*, Program: Advanced Computing.

2018 **"Optimization of Traffic Signals Timing Using Parameter-less Metaheuristic Optimization Algorithms"**, *Thaer Thaher*, Program: Advanced Computing.

2017 **"Increasing Customer Satisfaction on After Sales Service by Simulation Modeling in an Automobile Company"**, *Husam Mohammad Demaide*, Program: Engineering Management.

2017 **"Factors Affecting the Acceptance of E-Health System – A Case Study of Nablus Governorate Hospitals"**, *Mai Sameer Qutob*, Program: Engineering Management.

2015 **"A Framework for Acceptance of E-learning Technology in Palestinian Universities by Lecturers/ An Extension of Technology Acceptance Model TAM3"**, *Farid Al-Sayed*, Program: Engineering Management.

2015 **"Benchmark for Tuning Metaheuristic Optimization Technique to Optimize Traffic Light Signals Timing"**, *Rami Abu Shehab*, Program: Engineering Management. co-supervision

2013 **"Impact of Information and Communication Technology on Healthcare in Health Centers in Palestine"**, *Said Ibrahim*, Program: Engineering Management.

2013 **"Introducing Agile Software Development Methodology (Scrum) into a Software Development Project at a Local Firm"**, *Adham Mohammad Wasfe Hannoun*, Program: Engineering Management.

2012 **"The Impact of IS/IT strategy and business strategies alignment on business performance in the Palestinians firms"**, *Mohammad Helaly*, Program: Engineering Management.

2011 **"Software Development Process Improvement for Small Palestinian Software Development Companies"**, *Asem Isawi*, Program: Engineering Management.

2011 **"E-banking Adoption Model in Palestine"**, *Ahmed Khrewesh*, Program: Engineering Management.

2011 **"Opportunities and Challenges of Open-source Initiatives in the Palestinian e-Government Program"**, *Fadi Souqia*, Program: Engineering Management.

Other Experience

2019 **Participated in design and accreditation of Master of "Artificial Intellegence"**, *An-Najah National University*, Nablus, Palestine.

2017 **Certified for Outstanding Contribution in Reviewing, Journal of Computational Science**, Amsterdam, The Netherlands.

2015 **Participated in design of national water information system WIS**, Palestine.

2013 **Participated in design and accreditation of Master of "Advanced Computing"**, *An-Najah National University*, Nablus, Palestine.

2011 **Founding member of "Center of Excellence in Learning and Teaching (CELT)"**, *An-Najah National University*, Nablus, Palestine.

E-learning Experience

LIT **Participated in e-learning project LIT, during the project I developed the "internet programming" course as blended course using Moodle**.

CELT **TOT at Center of Excellence in Learning and Teaching: Designed and facilitated workshops about using technology in teaching and learning**.

Developing and teaching "Algorithms Applications" as blended course.

Scientific Publications

[1] **Baker Abdalhaq**, A. Awad, and A. Hawash. "A fast Binary Decision Diagram (BDD)-based reversible logic optimization engine driven by recent meta-heuristic reordering algorithms". In: *Microelectronics Reliability* 123 (2021), p. 114168. ISSN: 0026-2714. DOI: https://doi.org/10.1016/j.microrel.2021.114168. URL: https://www.sciencedirect.com/science/article/pii/S0026271421001347.

[2] **B. Abdalhaq**, A. Awad, and A. Hawash. "A Swarm Based Binary Decision Diagram (BDD) Reordering Optimizer For Reversible Circuit Synthesis". In: *Conference: IEEE 15th International Conference on Design Technology of Integrated Systems in Nanoscale Era At: Morocco*. Apr. 2020.

[3] **B. Abdalhaq**, A. Awad, and A. Hawash. "Reversible Logic Synthesis Using Binary Decision Diagrams With Exploiting Efficient Reordering Operators". In: *IEEE Access* 8 (Aug. 2020), pp. 156001–156016. DOI: 10.1109/ACCESS.2020.3019356.

[4] A. Hawash, A. Awad, and **Abdalhaq, Baker**. "Reversible Circuit Synthesis Time Reduction Based on Subtree-Circuit Mapping". In: *Applied Sciences* 10.12 (2020). ISSN: 2076-3417. DOI: 10.3390/app10124147. URL: https://www.mdpi.com/2076-3417/10/12/4147.

[5] A. Hawash, A. Awad, and **B. Abdalhaq**. "Towards Reducing Reversible Circuit Synthesis Time". In: *Conference: The 2019 IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT)At: Amman/Jordan*. Feb. 2019.

[6] T. Thaher, M. Mafarja, B. **Abdalhaq**, and H. Chantar. "Wrapper-based Feature Selection for Imbalanced Data using Binary Queuing Search Algorithm". In: *2019 2nd International Conference on new Trends in Computing Sciences (ICTCS)*. Oct. 2019, pp. 1–6. DOI: 10.1109/ICTCS.2019.8923039.

[7] T. Thaher, **B. Abdalhaq**, A. Hawash, and A. Awad. "Whale Optimization Algorithm for Traffic Signal Scheduling Problem". In: *Conference: ICICCT 2019 – International Conference on Innovative Computing and Cutting-edge Technologies At: Istanbul/Turkey*. Oct. 2019.

[8] A. Awad, **B. Abdalhaq**, and A. Hawash. "A Comparative Analysis of Binary Decision Diagram Reordering Algorithms for Reversible Circuit Synthesis". In: *IEEE-SSCI 2018 SYMPOSIUM SERIES ON COMPUTATIONAL INTELLIGENCE*. Sept. 2018, pp. 104–111. DOI: 10.1109/SSCI.2018.8628765.

[9] F. Al-Sayyed and **B. Abdalhaq**. "Interventional factors affecting instructors adoption of e-learning system: A case study of Palestine". In: *Journal of Theoretical and Applied Information Technology* 1083 (Feb. 2016).

[10] F. Al-Sayyed and **B. Abdalhaq**. "Interventional factors affecting instructors adoption of e-learning system in Palestine". In: *4th Palestinian International Conference on Computer and Information Technology (PICCIT 2015)* (2015).

[11] R. K. Abushehab, **B. K. Abdalhaq**, and B. Sartawi. "Genetic vs. particle swarm optimization techniques for traffic light signals timing". In: *2014 6th International Conference on Computer Science and Information Technology (CSIT)*. Mar. 2014, pp. 27–35. DOI: 10.1109/CSIT.2014.6805975.

[12] **B. K. Abdalhaq** and M. Abu Baker. "Using Meta Heuristic Algorithms to Improve Traffic Simulation". In: *Journal of Algorithms and Optimization* 2 (4 Oct. 2014), pp. 110–128.

[13] M. Hawash, **B. Abdalhaq**, A. Hawash, and M. Perkowski. "Application of Genetic Algorithm for Synthesis of Large Reversible Circuits using Covered Set Partitions". In: *International Symposium on Innovation in Information and Communication Technology (ISIICT 2011)*. Sept. 2011.

[14] **B. Abdalhaq** and I. Yaseen. "Factors affecting information technology adoption for learning in Palestinian schools (using TAM)". In: *An-Najah University Journal for Research*. Vol. 22. 2008, pp. 1063–1097.

[15] **B. Abdalhaq**, A. Cortés, T. Margalef, G. Bianchini, and E. Luque. "Between classical and ideal: enhancing wildland fire prediction using cluster computing". In: *Cluster Computing* 9.3 (July 2006), pp. 329–343. ISSN: 1573-7543. DOI: 10.1007/s10586-006-9745-4. URL: https://doi.org/10.1007/s10586-006-9745-4.

[16] **B. Abdalhaq**, A. Cortés, T. Margalef, and E. Luque. "Accelerating Wildland Fire Prediction on Cluster Systems". In: *Computational Science - ICCS 2004*. Ed. by M. Bubak, G. D. van Albada, P. M. A. Sloot, and J. Dongarra. Berlin, Heidelberg: Springer Berlin Heidelberg, 2004, pp. 220–227. ISBN: 978-3-540-24687-9.

[17] **B. Abdalhaq**, A. Cortés, T. Margalef, and E. Luque. "Accelerating Optimization of Input Parameters in Wildland Fire Simulation". In: *Parallel Processing and Applied Mathematics*. Ed. by R. Wyrzykowski, J. Dongarra, M. Paprzycki, and J. Waśniewski. Berlin, Heidelberg: Springer Berlin Heidelberg, 2004, pp. 1067–1074. ISBN: 978-3-540-24669-5.

[18] **B. Abdalhaq**, G. Bianchini, A. Cortés, T. Margalef, and E. Luque. "Improving Wildland Fire Prediction on MPI Clusters". In: *Recent Advances in Parallel Virtual Machine and Message Passing Interface*. Ed. by J. Dongarra, D. Laforenza, and S. Orlando. Berlin, Heidelberg: Springer Berlin Heidelberg, 2003, pp. 520–528. ISBN: 978-3-540-39924-7.

[19] **B. Abdalhaq**, A. Cortés, T. Margalef, E. Luque, and D. Viegas. "Improving convergence speed of optimization of input parameters in wild-land fire simulation". In: *XIV Jornadas de Paralelismo*. 2003.

[20] **B. Abdalhaq**, A. Cortés, T. Margalef, and E. Luque. "Optimization of Fire Propagation Model Inputs: A Grand Challenge Application on Metacomputers". In: *Euro-Par 2002 Parallel Processing*. Ed. by B. Monien and R. Feldmann. Berlin, Heidelberg: Springer Berlin Heidelberg, 2002, pp. 447–451. ISBN: 978-3-540-45706-0.

[21] **B. Abdalhaq**, A. Cortés, T. Margalef, and E. Luque. "Evolutionary Optimization Techniques on Computational Grids". In: *International Conference on Computational Science*. Apr. 2002, pp. 513–522. DOI: 10.1007/3-540-46043-8_52.

[22] **B. Abdalhaq**, A. Cortés, T. Margalef, and E. Luque. "Optimization of parameters in forest fire propagation models". In: *IV International Conference on Forest Fire Research*. Nov. 2002, p. 114.

[23] B. Qazzaz, **Abdalhaq, Baker**, D. Tamajon, D. I. Rexachs, and E. Luque. "A System for Data Collection of Environmental Information1". In: *Environmental Communication in the Information Society - Proceeding of the 16th conference* (2002), pp. 428–431.