Curriculum Vitae

Dr. Toufik Messaoud MAAROUK

Class A lecturer

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MARITAL STATUS

Name: MAAROUK
First name: Toufik Messaoud
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TRAINING

September 19, 2019 Habilitation in computer science.
                    University of Oum El Bouaghi.

2006-2012   Doctorate in computer science.
                Title: Formal models for the design of real-time systems.
                  Mention: Very honorable.
                Supervisor: Pr. Djamel Eddine Saidouni.
                Mentouri University – Constantine-

2004-2006   Magisterium in computer science, industrial computer science option.
                Title: Formal specification of real-time mobile systems.
                Supervisor: Pr. Djamel Eddine Saidouni
                University of Batna

2001-2002   Diploma of advanced studies in computer science.
                Title: Tools for Model Checking of Java applications.
                Option: programming, advanced compilation and parallelism.
                Mention: GOOD.
                Supervisor: Dr. Eric Madelaine
                University of Orleans, France.

1993-1998   computer engineer.
                Title: Recognition of handwritten Arabic characters.
                Option: hardware and software.
                Mention: GOOD.
                Supervisor: Pr. Loubna Suidi.
                Annaba University.

1991-1993 Bachelor of Mathematics.

       High school: Chihani Bachir.

PROFESSIONAL EXPERIENCE

Sept 2019   **Lecturer A.**Department of Mathematics and Computer Science, Abbès Laghrour Khenchela University.

July 2012- September 2019 Lecturer B. Department of Mathematics and Computer Science, Abbès Laghrour Khenchela University.

September 2009- June 2012 Assistant Professor A. Department of Mathematics and Computer Science, Abbès Laghrour Khenchela University

Sept 2008- Sep 2009 Assistant Professor A. Department of Mathematics and Computer Science, Alarbi Tebessi University, Tebessa.

Sept 2007- Sep 2008 Assistant Professor B. Department of Mathematics and Computer Science, Alarbi Tebessi University, Tebessa.

Oct 2004 – June 2007 Temporary teacher. Department of Mathematics and Computer Science, Abbès Laghrour Khenchela University.

TEACHING AND ADMINISTRATIVE RESPONSIBILITIES

October 2022-to date   Member of the scientific council of the faculty of science and technology, Abbès Laghrour Khenchela University

August 2021 - to date   Director of the ICOSI laboratory.

October 2019- September 2022 Elected member of the scientific committee of the Mathematics and Computer Science department, Abbès Laghrour Khenchela University.

September 2014 – July 2015 Head of the Mathematics and Computer Science Department, Abbès Laghrour Khenchela University.

March 2013- July 2013 Vice-dean in charge of teaching, faculty of science and technology, Abbès Laghrour Khenchela University.

Jan 2011- March 2013 Head of the Mathematics and Computer Science Department, Abbès Laghrour Khenchela University.

PUBLICATIONS AND COMMUNICATIONS

I. International publications

2024 Souidi, MEH, Ledmi, M.,**Maarouk, T.M**., Siam, A., & Ledmi, A. (2024). Multi-Agent Dynamic Leader-Follower Path Planning Applied to the Multi-Pursuer Multi-Evader Game. COMPUTING AND INFORMATICS, 42(5), 1158–1183.https://doi.org/10.31577/cai_2023_5_1158.

2023 Messaoudi, N., Hicham, H.,**Messaoud, MT**., Elkamel, HM (2023). Multi-layer consistency validation of IoT systems with UML inheritance dynamic diagrams via SPIN model checking. Information Systems Engineering, Vol. 28, No. 6, p. 1533-1547.https://doi.org/10.18280/isi.280610

2023**Maarouk, TM**., El Habib Souidi, M., Ledmi, M. & Sabeg, S. (2023). Formalization of BPMN Gateways using the DD-LOTOS Formal Language. Journal of Communications Software and Systems, 19 (4), 254-263.https://doi.org/10.24138/jcomss-2023-0138

2023 Souidi, ME,**Maarouk, TM**., Ledmi, M. et al. Multi-Pursuer Multi-Evader Games Based on Dynamic Elimination Priorities of the Dominated Strategies. J. Comput. Syst. Sci. Int. 62, 398–411 (2023).https://doi.org/10.1134/S106423072302017X

2023 Souidi, Mohammed El Habib, Haouassi, Hichem, Ledmi, Makhlouf,**Maarouk, Toufik Messaoud**, Ledmi, Abdeldjalil. 'A Discrete Particle Swarm Optimization Coalition Formation Algorithm for Multi-pursuer Multi-evader Game'. 1 Jan. 2023: 757 – 773.

2022 Haouassi Hichem, Merah Elkamel, Mehdaoui Rafik,**Maarouk Toufik Mesaaoud**, Chouhal Ouahiba. A new binary grasshopper optimization algorithm for feature selection problem, Journal of King Saud University - Computer and Information Sciences, Volume 34, Issue 2, 2022, Pages 316-328,https://doi.org/10.1016/j.jksuci.2019.11.007.

2021**Maarouk, T.M**., Souidi, MEH, & Hoggas, N. (2021). Formalization and Model Checking of BPMN Collaboration Diagrams with DD-LOTOS. COMPUTING AND INFORMATICS, 40(5), 1080–1107.https://doi.org/10.31577/cai_2021_5_1080

2019**Maarouk TM**, Merah E, Ghaoui S, Rahabi, N (2019) "FormalSemantics and Transformation of BPMN Models, International Journal of Business Process Integration and Management, Vol.9, No.3, pp 158-169.DOI:10.1504/IJBPIM.2019.100922

2019 R.Mahdaoui, LH Mouss, A. Haboussi, O. Chouhal, H. Houassi,**TM Maarouk**"A Temporal Neuro-Fuzzy System For Estimating Remaining Useful Life In Preheater Cement Cyclones", International Journal of Reliability, Quality and Safety Engineering World Scientific Publishing Company, DOI: 10.1142/S0218539319500128.

2018 H. Houassi, R. Mahdaoui,**TM Maarouk**"PSO with crossover operator applied to feature selection problem in classification", Informatica. , flight. 42 no. 2, pp. 189-192. 2018.

2016 H. Houassi,**TM Maarouk**, R. Mahdaoui "IP Address Lookup in an IP Router Based On a Reorganized Binary Prefixes Value Tree (RBPVT)", International Journal of Computer Networks and Applications. Volume 3, Issue 1, January – February.

2012**TM Maarouk**and DE Saidouni. Towards a calculus for distributed, real-time and mobile systems. Journal of Software (JSW, ISSN 1796-217X). Vol 7(3), pages 564-574. 2012.

II. <u>International communications</u>

2023 Mr. Belkebir,**TM Maarouk**, B. Nini and D. Belkebir, "Semantic-Layer: A High-Level Semantic Ontology For Data-Driven Approaches," 2023 International Conference on Decision Aid Sciences and Applications (DASA), Annaba, Algeria, 2023, pp. 213-217, doi: 10.1109/DASA59624.2023.10286750.

2022 S. Sabeg,**TM Maarouk**and M. El Habib Souidi, "Formal Specification and Verification for Organization-based systems: A Survey," 2022 4th International Conference on Pattern Analysis and Intelligent Systems (PAIS), Oum El Bouaghi, Algeria, 2022, pp. 1-6, doi: 10.1109/PAIS56586.2022.9946660.

2022 Belkebir, M.,**Maarouk, TM**., Nini, B. (2023). Integrating Ontology with Imaging and Artificial Vision for a High-Level Semantic: A Review. In: Al-Sharafi, MA, Al-Emran, M., Al-Kabi, MN, Shaalan, K. (eds) Proceedings of the 2nd International Conference on Emerging Technologies and Intelligent Systems. ICETIS 2022. Lecture Notes in Networks and Systems, vol 573. Springer, Cham.https://doi.org/10.1007/978-3-031-20429-6_4

2021 Mohammed El Habib Souidi,**Toufik Messaoud Maarouk**and Abdeldjalil Ledmi, "Multi-agent Ludo game collaborative path planning based on Markov decision process". In: International Conference on Inventive Systems and Control ICISC 2021.

2020 Bezza Assma, Elkamel Merah, Ameur-Boulifa Rabéa, Benaboud Rohallah and**Toufik Messaoud Maarouk**; "Formalization and Renement Proof for Embedded Systems".Fourth International Symposium on Informatics and its Applications (ISIA'20 Symp pp (I) Mohamed Boudiaf University of M'sila, Algeria, December 15th-16th, 2020).

2015**TM Maarouk**, DE Saidouni, R. Mahdaoui, H. Houassi "Interpretation of DD-LOTOS Specification by C-DATA*". In: Morzy T., Valduriez P., Bellatreche L. (eds) New Trends in Databases and Information Systems. ADBIS 2015. Communications in Computer and Information Science, vol 539. Springer, Cham.

2015 Houassi, R. Mahdaoui,**TM Maarouk**"Consultation of IP addresses in an IP router based on a reorganized binary tree" Conference on Optimization and Information Systems COSI'2015, June 1-3, 2015, Oran, Algeria.

2015 Mahdaoui, O. Chouhal,**TM Maarouk**, H. Houassi, LH Mouss "Temporal neurofuzzy system for fault prognostic in manufacturing system" The 1st International Conference on Applied Automation and Industrial Diagnostics (ICAAID 2015) Djelfa on 29-30 March 2015, Algeria.

2012**TMMaarouk**, DE Saidouni and A.Bezza. Environment of specification of real-time systems. 2nd International Conference on Information Systems and Technologies, pages 99-103, Sousse, 2012.

2011**TM Maarouk**, DE Saidouni, and M. Khergag. DD-LOTOS: A distributed real time language. In Proceedings 2nd Annual International Conference on Advances in Distributed and Parallel Computing (ADPC 2011) Special Track on: Real Time & Embedded Systems (RTES 2011), pages 45-50, Singapore, 2011.

2011**TM Maarouk**and DE Saidouni. Formal verification of real-time systems using a true concurrency semantics. International Conference on Information and Multimedia Technology (ICIMT 2011), Dubai, UAE.

2009 TM Maarouk and DE Saidouni. Supporting mobility in real-time process algebras. In Proceedings of International Conference on Applied Informatics ICAI2009, pages 10-15, Bordj Bouarréridj, Algeria, 2009.

III.   National communications

2008 DE Saidouni and TM Maarouk. MD-LOTOS: a formal specification model for real-time and mobile systems. National computer science seminar in Biskra (SNIB 08).

SUPERVISION ACTIVITIES

I.   Master and engineering

2008-2009 Design & implementation of real-time specifications. Engineering dissertation.
2009-2010 Development of a real-time systems specification environment in D-LOTOS. Engineering dissertation.

2016-2017 A formal semantics for BPMN business processes using process algebras.

2018-2019 Interpretation of BPMN conversation diagrams in DD-LOTOS.

II.   Doctoral theses

March 2023 to date Contribution to mining association rules for energy optimization in buildings. Co-supervision of the LMD doctoral thesis of candidate Necibi Khaoula, University of Khenchela.

2022 to date Formal methods for exploring architectures and designing reliable systems. Co-supervision of the doctoral thesis in sciences of candidate Bezza Assma- University of Oum El Bouaghi.

2021 to date Proposal of semantic models for improving standard image processing methods based on inductive inference. LMD doctoral thesis director of candidate Belkebir Malak, University of Oum El Bouaghi.

April 2021 to date Formal approach to the design of coordination mechanisms. LMD doctoral thesis supervisor of candidate Youcef Foughali, University of Khenchela.

Nov 2019 to date Formal models for the design of Multi-Agent Systems. LMD doctoral thesis supervisor of candidate Sabeg Samra, University of Khenchela.

III. Master

2019-2020 Verification of BPMN business processes: logical approach.

2019-2020 Design and development of a mobile application.

2020-2021 Transformation of BPMN collaboration diagrams into Promela language.

2020-2021 Model-checking of BPMN collaboration diagrams.

2021-2022 An operational semantics for BPMN collaboration diagrams.

2022-2023 Integration of Algebra of Communicating Processes in the Design of Fog Systems.

POST-GRADUATION TEACHING ACTIVITIES

2022-2023 Information and communication technologies. Trainer as part of initial postgraduate training (taught online via the Doctoral Student Support Platform https://padoc.univ-ouargla.dz/).

2020-2021 Formal Methods for Software Specification and Verification. Course intended for first year doctoral students, IT specialty. University of Oum El Bouaghi.

2020-2021 Information and communication technologies. Course intended for first year doctoral students, specializing in literary studies. University of Khenchela.

RESEARCH ACTIVITIES

I.   Attached laboratory

August 2021to date Director of the ICOSI Knowledge Engineering and Computer Security laboratory.

2013– 2021 Member of the ICOSI laboratory. "Models, Computation, Algorithms and Proof" Team

2006-2013 Member of the Modeling and Implementation of Complex Systems (MISC) laboratory, University of Constantine. "Distributed verification of critical systems" team

II.   Organization of scientific events

December 18-19, 2023 President of the doctoral days on computer science and mathematics, University of Khenchela.

April 17-18, 2023 Member of the organizing committee for the scientific week on artificial intelligence.

March 14-15, 2023 Member of the organizing committee of the week on pi-day.

2022 Chairman of the scientific committee of the 1st doctoral days on "Artificial Intelligence & its Applications" AIA'22, University of Khenchela. December 18, 19 and 20, 2022.

2022 Participation in the creation of the thematic research network in artificial intelligence, Algiers, December 10, 2022.

2022 Member of the Scientific Committee of the 4th international conference on pattern analysis and intelligent system, University of Oum El Bouaghi, Algeria, October 12-13, 2022.
2021 Member of the Organizing Committee of the 1st international visio conference on materials science and engineering ICMSE2021, University of Khenchela, Algeria, November 17-18, 2021.

2021 Member of the Scientific Committee of the IEEE international conference on recent advances in mathematics and informatics (ICRAMI'2021), University of Tebessa, Algeria, September 21-22, 2021.

2021 Member of the Scientific Committee of the 2nd international conference on complex systems and their application (ICCSA'21), University of Oum El Bouaghi, Algeria, May 25-26, 2021.