Curriculum Vitae

Lyes Saad Saoud

Post-Doctoral Fellow
Department of Mechanical Engineering
Khalifa University, United Arab Emirates
Email: saadsaoudl@yahoo.fr

Summary

I am a highly accomplished Post-Doctoral Fellow with a solid academic foundation in Physics and Electronics, coupled with extensive experience across research, teaching, and consulting domains. Throughout my career, I have demonstrated unwavering dedication to advancing applied research, particularly in the realms of machine learning and data science. My achievements include a robust track record of successful project leadership and a substantial portfolio of research publications. I am passionate about integrating cutting-edge technologies, such as artificial intelligence, into practical, real-world applications.

My skill set encompasses advanced data analysis and adept problem-solving, underpinned by a deep commitment to the practical implementation of artificial intelligence and machine learning. I excel both as an independent researcher and as a collaborative team player, making me an ideal fit for multidisciplinary projects.

Education

Doctor of Philosophy – **Physics - USA equivalency confirmed by EDGE** 2011-2015
United Arab Emirates Equivalency
University of Boumerdes, Algeria

Master of Science - **Electronics– USA equivalency confirmed by EDGE** 2003-2005
University of Setif, Algeria

Bachelor of Science - Engineer **Electronics– USA equivalency confirmed by EDGE** 1998-2003
University of Setif, Algeria

Empowerment to Direct Research degree - Physics 2015-2017
University of Boumerdes, Algeria

Professional Experience

Senior Consultant: Predictions, Machine Learning, Data science, Cybersecurity 2018-2019
IOTwitt incorporation, Hawaii, USA

Senior Consultant, Data science, cybersecurity 2017-2018
IOTwitt incorporation, Hawaii, USA

Post-Doctoral fellow - Mechanical Engineering 2022-now
Khalifa University, United Arab Emirates (Full time)

Post-Doctoral fellow - Electrical Engineering and Computer Science 2019-2022
Khalifa University, United Arab Emirates (Full time)

Head of Department - Electrical Engineering 2018-2019
University of Boumerdes, Algeria (Full time)

Associate Professor - Electrical Engineering 2015-2019
University of Boumerdes, Algeria (Full time)

Visiting Post-Doctoral fellow – REDLab 2015-2019
University of Hawai'i at Manoa, USA (Part time)

Assistant Professor - Physics 2009-2015
University of Boumerdes, Algeria (Full time)

Awards and Funding

1. PI-PRFU Project: Smart Cities and Renewable Energy, No. 10N01UN350120180002, Research Projects University Training, Algeria, from January 1st 2018.
2. Co-PI- CNEPRU project: Characterization of electronic components and implementation on complex systems. Research Projects University Training, Algeria, N ° J0200320090014 from January 2010 to December 2014.
3. Co-PI- CNEPRU project: Characterization of Electronic Components and Implementation on Complex Systems, Research Projects University Training, Part II. No. A10N01UN350120130013 from January 2015 to December 2018.

Teaching Experience

Since joining the University of Boumerdes in December 2009, I have taught a wide range of courses, fulfilling crucial teaching requirements. Both the Electrical and Physics departments require me to teach junior and capstone design courses at the undergraduate level. At the graduate level, my expertise in embedded system-based microcontroller and microprocessor courses, as well as real-time and embedded systems courses, enables me to effectively teach and guide students in these areas.

Master's Level Courses

- Power electronics (Course materials: 107 pages) - Taught for 2 years
- Modern microprocessors (Course materials: 125 pages) - Taught for 5 years
- Systems-based microprocessor design (Course materials: 84 pages) - Taught for 5 years
- Bio microsystems - Master (Course materials: 125 pages) - Taught for 5 years
- Conditioning circuits - Master (Course materials: 103 pages) - Taught for 5 years
- Systems-based microcontroller - Master (Course materials: 243 pages) - Taught for 5 years

- Bio microsystems - Master (Course materials: 125 pages) - Taught for 5 years
  Embedded Systems - Master (Course materials: 111 pages) - Taught for 5 years
- Real-time Systems and Embedded Systems - Master (Course materials: 70 pages) - Taught for 1 year

Bachelor's Level Courses

- Elements of robotic systems – Bachelor (Course materials: 60 pages) - Taught for 2 years
- Manipulation of electronic – Bachelor (Course materials: 60 pages) - Taught for 2 years
- Manipulation of numerical methods – Bachelor (Course materials: 60 pages) - Taught for 2 years

Additional Courses

- Ethics and Deontology (Master's Level) - Taught for 4 years

My commitment to education extends beyond the classroom, as I have also developed comprehensive course support materials, including lectures, exercises, and laboratory work. These materials have been instrumental in providing students with a well-rounded understanding of the subjects, fostering their growth, and preparing them for real-world challenges. Furthermore, my expertise in embedded systems, microcontrollers, and microprocessors has enabled me to guide and mentor students effectively, ensuring they acquire practical skills and knowledge in these specialized areas.

Selected Publications (Citations: 588, h-index: **14**, i10-index: **20**)

I am particularly interested in applied research that addresses the challenge of implementing high-performance algorithms on small devices, as seen in the transfer from supercomputers. I'm currently working on integrating artificial intelligence with robots and addressing problems related to underwater environments.

Journal articles

1. Hasan AlMarzouqi, Lyes Saad Saoud, Semantic Labeling of High Resolution Images Using EfficientUNets and Transformers, arXiv:2206.09731, 2022.

2. Lyes Saad Saoud, Hasan AlMarzouqi, Ramy Hussein, Cascaded Deep Hybrid Models for Multistep Household Energy Consumption Forecasting, arXiv:2207.02589, 2022.

3. Lyes Saad Saoud, Hasan AlMarzouqi, Ramy Hussein, "Household Energy Consumption Prediction Using the Stationary Wavelet Transform and Transformers," in IEEE Access, vol. 10, pp. 5171-5183, 2022, doi: 10.1109/ACCESS.2022.3140818.

4. Lyes Saad Saoud, Hasan AlMarzouqi, Forecasting Solar Irradiance Using Hybrid Stationary Wavelet Transform- Quaternion Valued Neural Network with a Softplus AMSGrad Learning Algorithm, 2022 IEEE International Conference on Power Systems Technology (POWERCON), Pullman, Kuala Lumpur, MALAYSIA , 12-14 September 2022.

5. Shadab Shishegar, Reza Ghorbani, Lyes Saad Saoud, Sophie Duchesne & Geneviève Pelletier (2021) Rainfall–runoff modelling using octonion-valued neural networks, Hydrological Sciences Journal, 66:13, 1857-1865, DOI: 10.1080/02626667.2021.1962885

6. Lyes Saad Saoud, Hasan Al-Marzouqi, Mohammed Deriche, Wind speed forecasting using the stationary wavelet transform and quaternion adaptive gradient methods, IEEE Access 9, 127356-127367, 2021.

7. K. Aimeur, L. Saad Saoud, R. Ghorbani, Short-Term Solar Irradiance Forecasting and Photovoltaic System Management Using Octonion Neural Networks, Applied Solar Energy 56 (3), 219-226, 2020.

8. Lyes Saad Saoud and Hasan Al-Marzouqi, Metacognitive Sedenion-Valued Neural Network and Its Learning Algorithm, IEEE access, vol. 8, pp. 144823-144838, 2020

9. L. Saad Saoud, R. Ghorbani, "Metacognitive Octonion-Valued Neural Networks as They Relate to Time Series Analysis," in IEEE Transactions on Neural Networks and Learning Systems, vol. 31, no. 2, pp. 539-548, Feb. 2020, doi: 10.1109/TNNLS.2019.2905643.

10. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari "A novel method to forecast 24 hours of global solar irradiation", Energy systems, Volume 9, Issue 1, pp 171–193, 2018, Springer-Verlag, Berlin Heidelberg.

11. L. Saad Saoud, R. Ghorbani, F. Rahmoune, "Cognitive Quaternion Valued Neural Network and some applications", Neurocomputing, Volume 221, Pages 85–93, 2017, Elsevier.

12. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari "Fully Complex Valued Wavelet Network for Forecasting the Global Solar Irradiation", Neural Processing Letters, Volume 45, Issue 2, pp 475–505, 2017, Springer-Verlag, Berlin Heidelberg.

13. E. Reihani, M. Motalleb, R. Ghorbani, L. Saad Saoud, "Load peak shaving and power smoothing of a distribution grid with high renewable energy penetration", Renewable Energy, 86, 1372-1379, 2016.

14. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Generalized dynamical fuzzy model for identification and prediction ", Journal of Intelligent and Fuzzy Systems, 26, 1771–1785, 2014.

15. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Complex-valued forecasting of global solar irradiation", Journal of Renewable and Sustainable Energy, 5(4), pp. 043124-043145, 2013.

16. L. Saad Saoud, et al., "A Neural Network Based on an Inexpensive Eight Bit Microcontroller" Neural computing and application, vol. 20, no3, pp. 329-334 Springer-Verlag London, 2011.

17. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, “Prediction of the daily global solar Irradiation of the great Maghreb region using the complex-valued neural networks”, Revue des Energies Renouvelables, Vol. 17 N°1, pp. 173 – 185, 2014.

18. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Modeling pH Neutralization Process using Fuzzy Dynamic Neural units Approaches." International Journal of Computer Applications 28(4):22-29, 2011. Foundation of Computer Science, New York, USA.

19. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Wavelet Network Implementation on an Inexpensive Eight Bit Microcontroller," in: Features of Liquid Crystal Display Materials and Processes, Natalia V. Kamanina (Ed.), 87-102, Intech publisher, 2011.

20. L. Saad Saoud, F. Rahmoune, V. Tourtchine, K. Baddari, "Complex-valued wavelet neural network prediction of the daily global solar irradiation of the Great Maghreb Region", in Progress in Clean Energy Analysis and Modeling, I. Dincer et al. Ed. Springer Berlin Heidelberg, 2015, pp 321-339.

21. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Short term forecasting of the global solar irradiation using the fuzzy modeling technique: case study of Tamanrasset city, Algeria", in Progress in Clean Energy Analysis and Modeling, I. Dincer et al. Ed. Springer Berlin Heidelberg, 2015, pp. 281-289.

22. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Photovoltaic Maximum Power Modeling using Radial Basis Function Network Based on the PIC Microcontroller", in: Artificial Intelligence and Hybrid Systems, iConcept Press, 2013.

Conference papers

1. L. Saad. Saoud and H. AlMarzouqi, "Forecasting Solar Irradiance using Hybrid Stationary Wavelet Transform- Quaternion Valued Neural Network with a Softplus AMSGrad Learning Algorithm," 2022 IEEE International Conference on Power Systems Technology (POWERCON), 2022, pp. 1-6, doi: 10.1109/POWERCON53406.2022.9929612.

2. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "On the generalized dynamical fuzzy model for forecasting complex systems", Global Conference on Applied Computing in Science and Engineering, Rome (Italy), 27-29 July 2016.

3. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Quaternion neural network to forecast the daily solar irradiation", 3ed International Symposium on Innovative Technologies in Engineering and Science, 3-5 June 2015, Valencia –Spain.

4. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Quaternion neural network to forecast the daily solar irradiation", 3ed International Symposium on Innovative Technologies in Engineering and Science, 3-5 June 2015, Valencia –Spain

5. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "On the Fuzzy Modeling Based Estimation of Maximum Power Generation from Photovoltaic Module", IEEE proceeding of 2013 3rd International Conference on Systems and Control (ICSC) , 29-31 Oct. 2013, pp. 6 – 11, Algiers, Algeria.

6. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Design of a Dynamic Neural Network with Kalman Filter for the Identification of Nonlinear Systems. Application: prediction of the maximum power generated by a Photovoltaic module", 1ST International Symposium on Innovative Technologies in Engineering and Science, 07 - 09 June 2013, Sakarya, Turkey.

7. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "Identification of Bioprocesses Using Random Search and Simulated Annealing Algorithms", 2012 6th International Conference on Sciences of Electronics, Technologies of Information and Telecommunications (SETIT), Sousse, Tunisia.

8. L. Saad Saoud, F. Rahmoune, V. Tourtchine and K. Baddari, "An Inexpensive Embedded Electronic Continuous Stirred Tank Reactor (CSTR) Based on Neural Networks," IEEE proceedings of International Conference on Multimedia Technology (ICMT), 26-28 July 2011, pp. 6233 - 6237, Hang Zhou, China, 2011.

Patent

1. Hasan AlMarzouqi, Lyes Saad Saoud, Metacognitive sedenion-valued neural networks, US Patent App. 17/581,767, 2022.

Supervision

1. BOUKHEMIS Houssam Eddine, M.S.
   - Project: Design and realization of a wireless EEG headset.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2017/2018.
2. N'GUETTA MARIE-DANIELLE ELISÉE, M.S.
   - Project: Realization of an intelligent system for the temperature measurement of premature newborns.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2017/2018.
3. FELKKIR Mohamed Walid, M.S.
   - Project: Realization of a secure M2M medical data transmission system via Arduino and GSM shield.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2017/2018.
4. ABDICHE Rime and SLIMANI Wiam, M.S.
   - Project: Monitoring heartbeat via Arduino and Internet of Things (IoT).
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2017/2018.
5. AIT AISSA Sara and RABAH Imad, M.S.
   - Project: Realization of an embedded system for face and emotion recognition.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2018/2019.
6. ALILI Hanane and OULD SAIDI Kahina, M.S.
   - Project: Realization of a secure car theft system.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2018/2019.
7. DIB Douaa SAIDI Faiza, M.S.
   - Project: Realization of an intelligent radar based on ultrasound and motion sensors.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2018/2019.
8. KENDIL Fahima and KHERBACHI Imène, M.S.
   - Project: Arduinos Tweet together smartly and safely.

- Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
- Year: 2018/2019.

9. BELLOUT Amina and MOKRANI Souhila, M.S.
   - Project: Smart Home-Based Non-Contact Current Sensor.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2018/2019.
10. AOUININE Mohamed Ryad and BENACEUR Kenza, M.S.
   - Project: Realization of a smart current meter for particular.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2018/2019.
11. OUKIL Oussama and TAFLIS Hemza, M.S.
   - Project: Realization of an autonomous quadrotor drone.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2018/2019.
12. DOUAIBIA Nadjet and HADJZIANE Intissar, M.S.
   - Project: Realization of a portable radar to detect the speed of objects.
   - Collaboration: University of Boumerdes in collaboration with the University of Hawaii at Manoa.
   - Year: 2018/2019.

13. Aimeur Kamel, Ph.D, Hypercomplex neural networks for predicting renewable energy data, University of Boumerdes.

These projects covered a wide range of topics, from medical device design to IoT applications and autonomous drone systems, showcasing your students' diverse research interests and skills.

Professional and Academic Services

- Editorial board Global Journal US, Computer sciences.
- Committee member: " International Conference on Computer Information Systems and Industrial Applications CISIA2015", June 28-29, 2015, Bangkok, Thailand.
- Committee member: 3rd International Symposium on innovative technologies in engineering and science 3-5 June 2015 Universidad Politecnica de Valencia Valencia – Spain
- Committee member: 4th International Symposium on innovative technologies in engineering and science 3-05 Nov 2016 Alanya/Antalya – Turkey.
- Committee member: 5th international symposium on innovative technologies in engineering and science 29 Sept.-01 Oct. 2017 Architecture and Construction University Baku – Azerbaijan.
- Committee member: 3rd international symposium on innovative technologies in engineering and science, Bursa between the 21-23 October 2022 in Bursa / Turkey.
- Committee member: " International Conference on Environmental Science and Energy Engineering (ICESEE2015)", June 26-27, 2015, Phuket, Thailand.
- Committee Member: "3ed International Symposium on Innovative Technologies in Engineering and Science", 3-5 June 2015, Valencia –Spain
- Technical Review Panel: Transaction on Neural Network and learning systems, IEEE.
- Technical Review Panel: Neural computing and applications, Springer.
- Technical Review Panel: Transactions of the Institute of Measurement and Control, SAGE Publications.

- Technical Review Panel: Journal of Renewable and Sustainable Energy, American Institute of Physics
- Faculty of Engineering Senate Member
- Department of Electrical Engineering Senate Member
- M.Sc. thesis committee member
- Council Member, Undergraduate Research Opportunity Program