Laith Sawaqed, Ph.D.

Associate Professor
E-mail: lssawqed@just.edu.jo
 laith.sawaqed@gmail.com
 lsawaqed@hct.ac.ae
Address: Engineering Technology Science
 Higher Colleges of Technology
 Ras Al Khaimah
Cell : +971-50-569-1983
Whatsapp: +(962) 798-534-355

PERSONAL INFORMATION:

- Nationality: Jordanian
- Gender: Male
- Birth date: Jan 31st, 1983
- Marital status: Married (3 kids)

EDUCATION:

- **Ph.D**. in **Mechanical Engineering** from **University of Maryland**, **college Park**, **USA** (2013). **Dissertation title**: "ROBOTIC SOUND SOURCE LOCALIZATION AND TRACKING USING BIO-INSPIRED MINIATURE ACOUSTIC SENSORS".

- **M.Sc.** in **Mechanical Engineering (Mechatronics)** from **Jordan University of Science & Technology** (*JUST*), **JORDAN**, (2008). **Thesis Title**: "MOBILE ROBOT MAPPING OF UNKNOWN ENVIRONMENTS BASED ON FUZZY LOGIC MODELING OF SONAR SENSOR MEASUREMENTS".

- **B.Sc**. in **Mechanical Engineering** (**Mechatronics**) from **Jordan University of Science & Technology** (*JUST*), **JORDAN**, (2006). **Project title**: "REDESIGN AND IMPLEMENTATION OF ALUMINUM BARS WRAPPING MACHINE".

Certificates:

- Training course in **Development of Curriculum and Study Plans According to ABET**, 12 training Hours, 11, 13, 16 / 3 /2014.
- Training course in **Innovation Teaching in Higher Education**, 12 training Hours, 11, 13, 18-19 / 1 / /2015.

- **New Models for Energy Education and Innovation Workshop**, Lisbon, 9th to 11th May 2018, part of Smart Control Systems for Energy Management (SEM-SEM) program, Erasmus+.
- **Training Program** for Academic and Administrative staff appointed as self-assessment team of the Engineering Study Programs Selected for EUR-ACE accreditation, 11-12 / 2 / 2019.

RESEARCH INTERESTS:

- Mechatronics.
- Dynamics & Control
- Artificial Intelligence.
- Robotics.

PROFESSIONAL EXPERIENCE:

➢ Administrative
- **Since September – 2019 to August 2021:** Assistant Dean of Faculty of Engineering at Jordan university of Science and Technology.
- **Since September - 2016 to August - 2018:** The chairman of the mechanical engineering department at Jordan university of Science and Technology.

➢ Teaching:

- **Associate Professor**, Mechanical Engineering Department, Jordan University of Science and Technology, Irbid, Jordan, **March 2023-Present.**

- **Assistant Professor** at the Faculty of Engineering, Higher Colleges of Technology at Ras Al Khaimah, Men's Campus, **August 2021 - Present**.

- Assistant Professor **from May – 2014 with seniority in rank awarded from December – 2013**, at the Mechanical Engineering Department of Jordan University of Science & Technology, Irbid, Jordan. I have been serving the mechanical engineering department in several aspects:

  1) **Establishing** and **constructing** the new "Robotics and UAV" LAB at Jordan University of Science & Technology.
  2) Member of the **ABET** accreditation committee.
  3) I also teach the following courses:

Undergraduate level

- CONTROL SYSTEMS LAB
- INSTRUMENTATION AND DYNAMIC SYSTEMS LAB
- ENGINEERING MECHANICS
- FUNDAMENTALS OF ELECTRONICS AND DIGITAL LOGIC
- INTRODUCTION TO ROBOTS
- ARTIFICIAL INTELLIGENT SYSTEMS
- MECHATRONICS LAB
- MICROCONTROLLER APPLICATIONS
- MODELLING SIMULATION AND ANALYSIS OF PHYSICAL SYSTEM
- NEURO-FUZZY CONTROL SYSTEMS
- ROBOTICS
- STATICS
- STRENGTH OF MATERIALS
- APPLIED MECHANICAL VIBRATIONS

Graduate Level

- ADVANCED APPLIED MATHEMATICS
- ADVANCED CONTROL SYSTEMS
- APPLIED MATHEMATICS FOR MECHATRONICS ENG
- ARTIFICIAL INTELLIGENT SYSTEMS
- EMBEDDED SYSTEMS IN MECHATRONICS
- INTRODUCTION TO ROBOTS
- MODELLING AND SIMULATION OF DYNAMIC SYSTEMS

4) Supervise graduate (M.Sc.) and undergraduate (B.Sc.) students

- Full-Time lecturer from **October – 2013 to May – 2014**.

➢ **Consultation**
- **Since January-2016 to January 2019:** Serving as one of the main advisors of MASAR initiative (One of the Crown Prince Foundation initiatives) to design and implement a CubeSat (cube satellite) ADCS system and the Manufacture the CubeSat structure (cube satellite).
- Member of Nuclear Safety Committee, Jordan Atomic Energy Commission, Jordan Research and Training Reactor (**2016 – 2017**).
- Member of the judging committee for PAIR (Phi's Applied Research and Innovative Research) Program Product Proposal Presentation (**since 2019**).
- Member of the judging committee for NASA's International Space Apps Challenge **(October 2-3, 2021)**.

> **Professional**
> - **July-2006** to **July-2009:** Sales Engineer at Izzat Marji Group/Jordan.

> **Internship**
> - **June 2005 internship at JALCo,** during the 40 days training, I was trained on testing and maintaining different types of jet engines ranging from small to large size engines.

PUBLICATINS:

Journal Publications:

1- Sawaqed, L., Hatamleh, K.S., Jaradat, M.A. and Khasawneh, Q., 2018. **Synthesis Optimization of Piezo Driven Four Bar Mechanism Using Genetic Algorithm**. Intelligent Automation and Soft Computing, 24(3), pp.507-515.

2- Hatamleh, K., Khasawneh, Q., Al-Ghasem, A., Jaradat, M., Sawaqed, L., AlShabi, M., (2018). **Scanning electron microscope fine tuning using four-bar piezoelectric actuated mechanism**. Journal of Electrical Engineering. 69. 24-31. 10.1515/jee-2018-0003.

3- Mohammad A. Jaradat, Laith S. Sawaqed, Mohammad M. Alzgool, **Optimization of PIDD2-FLC for blood glucose level using particle swarm optimization with linearly decreasing weight**, Biomedical Signal Processing and Control, Volume 59, 2020, 101922, ISSN 1746-8094, https://doi.org/10.1016/j.bspc.2020.101922.

4- R. Khnouf, M. Jaradat, D. Karasneh, F. Al-Shami, L. Sawaqed and B. A. Albiss, **"Simulation and optimization of a Single Heater Convective PCR Chip and Its Controller for Fast Salmonella Enteritidis Detection,"** in IEEE Sensors Journal, doi: 10.1109/JSEN.2020.3004285.

5- Laith S. Sawaqed, and Ayman M. Alrayes, **Bearing Fault Diagnostic Using Machine Learning Algorithms**, Published on 01/10/2020 in Progress in Artificial Intelligence, https://doi.org/10.1007/s13748-020-00217-z.

6- Laith Sawaqed, and Jeries Mukattash, **Optimization of the Subtractive Clustering Method Parameters Embedded in ANFIS Using Genetic Algorithm**, submitted on 9/3/2021 to Expert Systems with Applications.

7- Laith Sawaqed, Ahmad Fares and Ahmad Bani Younes, **Adaptive Reinforcement Learning-Based Controller for the Active Suspension System using DDPG Method,** submitted on 13/4/2021 to IEEE Transactions on Mechatronics.

8- Laith Sawaqed, Ahmad Bani Younes, and Mohammad Aldalal'ah, **Aerodynamics effect of holes in UAV wings modified for VTOL capability**, Accepted on 30/05/2022, Drone Systems and Applications. https://doi.org/10.1139/dsa-2021-0031

9- Laith Sawaqed, and Israa Rabbaa, **Fuzzy Yaw Rate and Sideslip Angle Direct Yaw Moment Control for Student Electric Racing Vehicle with Independent Motors**, Accepted on 15/06/2022, World Electric Vehicle Journal.
https://doi.org/10.3390/wevj13070109

Conference Publications:

1- M. AlHamaydeh, M. A. Jaradat, M. Serry, L. Sawaqed and K. S. Hatamleh, **"Structural control of MR-dampers with genetic algorithm-optimized Quasi-Bang-Bang controller,"** 2017 7th International Conference on Modeling, Simulation, and Applied Optimization (ICMSAO), Sharjah, 2017, pp. 1-6.

2- L. Sawaqed, A. I. Al-Ali, K. S. Hatamleh and M. A. Jaradat, **"Modeling and simulation of a moving robotic arm mounted on wheelchair,"** 2017 7th International Conference on Modeling, Simulation, and Applied Optimization (ICMSAO), Sharjah, 2017, pp. 1-5.

3- K. S. Hatamleh, Q. A. Khasawneh, L. Sawaqed, M. M. Hassan, S. Yafawi and M. Al-Shabi, **"Evolutionary low-cost visual shooting practice system,"** 2015 10th International Symposium on Mechatronics and its Applications (ISMA), Sharjah, 2015, pp. 1-6. doi: 10.1109/ISMA.2015.7373484

4- L. Sawaqed, M. AlShabi, S. Alshaer and I. Salameh, **"An improved K-means clustering algorithm for two half-moon classification,"** 2015 10th International Symposium on Mechatronics and its Applications (ISMA), Sharjah, 2015, pp. 1-4. doi: 10.1109/ISMA.2015.7373482

5- L. Sawaqed, H. Liu, and M. Yu, **"Robotic Sound Source Localization Using Bio-Inspired Acoustic Sensors,"** in Volume 4: Dynamics, Control and Uncertainty, Parts A and B, 2012, p. 57.

PROFESSIONAL SERVICE:

Reviewing activity: Referee for the following Journals
1) Journal of Vibration and Control
2) Journal of Intelligent and Fuzzy Systems
3) Jordan Journal of Physics

Conferences:

- Session chair at the 7th International Conference on Modeling, Simulation and Applied Optimization (ICMSAO'17) held at the American University of Sharjah, United Arab Emirates during the period April 4-6,2017.

- Session chair at the 5th HCT MULTI-CONFERENCES in Advances in Science and Engineering Technology (ASET 2023) held at the Higher colleges of Technology – Dubai Men's Campus.

SCHOLARSHIP, FELLOWSHIPS, AND AWARDS:

- Teaching fellowship, Mechanical Engineering Department, University of Maryland - College Park, MD, USA, 2010-2013.

- Awarded a full scholarship to attain the Doctoral degree in Mechanical Engineering - Intelligent Systems from one of the top 20 universities in the US.

PROJECTS:

- **Design and Implementation of CVT gear system using 3D printing**
    - 6 undergraduate students are involved
- **Design and Implementation of an electric generator embedded in main water pipes.**
    - 4 undergraduate students were involved.
- **Design and Implementation of a BABY status Monitoring system for parents with hearing impairment.**
    - 5 undergraduate students were involved.
- **Developing Curricula for Artificial Intelligence and Robotics (DeCAIR),** Reference Number618535-EPP-1-2020-1-JO-EPPKA2-CBHE-JP,
  http://erasmus-plus.org.jo/Portals/0/Projects%202020/618535.pdf?ver=2020-08-05-081120-717
  https://eacea.ec.europa.eu/erasmus-plus/funding/capacity-building-in-the-field-of-higher-education-2020_en
- **Design and Implementation of a six-legged robot.**
    - 2 undergraduate students were involved.
- **Design and Implementation of an ornithopter robot.**
- **Design and Implementation of a dual tilting rotor UAV.**
    - 2 undergraduate students were involved.
- **Modeling and control of a six-legged robot in MatLab/Simulink virtual reality.**
    - 1 graduate student was involved.
- **Design and implementation of a micro UAV.**

- 1 undergraduate student was involved.
- **Design and implementation of an autonomous Solar panels cleaning robot.**
  - 3 undergraduate students were involved.
- **Design and implementation of a CubeSat vibration test bed.**
  - 1 master student was involved.
- **Design and implementation of an autonomous 3-axis CNC machine.**
  - 2 undergraduate students were involved.
- **Design and implementation of an Electric car**
  - 8 undergraduate students are involved.

TECHNICAL SKILLS:

- Excellent experimental research experience. Preparing and conducted several experiments and tests in multiple areas, including but not limited to: sound tracking using rotational stages, robot tracking using VICON system, image processing.
- Excellent programming skills in (**LabVIEW**, **MatLab, Mathematica**, **assembly, C++**).
- Excellent mechanical drawing skills using **AutoCAD, Mechanical Desktop, and SolidWorks**.
- Excellent communication skills, I also prefer teamwork atmospheres.

Professional using the following engineering programs:

1- **MATHWORKS MATLAB** program, Control toolbox, Image Processing toolbox, signal processing block set, Fuzzy control toolbox, Optimization Toolbox, Neural Network Toolbox, ANFIS toolbox, MATLAB Simulink, Simechanics robotics subset of MATLAB, and MATLAB virtual Reality.
2- **Mathematica** program, solve serial manipulators problems symbolically.
3- **LabView** program, used to extract experimental data and control physical processes or systems.
4- **Automation Studio**, used to draw and simulate pneumatic, electro-pneumatic, hydraulic and electro-hydraulic circuits.
5- **LG PLC ladder diagram builder.**
6- **Thrisim** program used to write, and simulate and assemble the assembly language programs written for the Motorola 68HC11 microcontroller.
7- **AxIDE** program, used to communicate with Motorola 68HC11 based microcontroller boards.
8- **Electrical work bench EWB and Circuit Maker** programs, used to draw and simulate designed digital electrical circuits.

M. Sc. THESIS SUPERVISION:

1) MODELING AND SIMULATION OF A MOVING ROBOTIC ARM MOUNTED ON WHEELCHAIR
2) BLOOD GLUCOSE CONTROL USING PARTICLE SWARM OPTIMIZED PID-FUZZY CONTROLLER WITH LINEARLY DECREASING WEIGHT
3) CONTROL OF A TWIN ROTOR TRMS USING FUZZY LOGIC
4) ADAPTIVE NEURO-FUZZY INFERENCE SYSTEM SUBTRACTIVE CLUSTERING PARAMETERS OPTIMIZATION USING GENETIC ALGORITHMS
5) HEALTH MONITORING OF BEARING IN ELECTRO-MECHANICAL SYSTEMS USING MACHINE LEARNING ALGORITHMS
6) CONTROL OF AN ELECTRIC VEHICLE WITH DIFFERENT CONFIGURATIONS USING FUZZY LOGIC
7) CONTROL OF RHex ROBOT USING FUZZY LOGIC
8) AERODYNAMICS EFFECT OF INDUCED HOLES IN THE X8 SKYWALKER WINGS

CONTINUING EDUCATION & PROFESSIONAL DEVELOPMENT:

- Conducting a seminar at the American University of MADABA on "Step-by-Step preparation for ABET Accreditation", March 2019.
- Conducting training course at Prince AL Hussein bin Abdullah II Academy of Civil Protection on "Programming using MatLab/Simulink", February, 2019
- Conducting training course at Jordan University of Science and Technology on "Introduction to Programming using MatLab/Simulink", August, 2018
- Conducting training course at Jordan University of Science and Technology on "Introduction to Programming using MatLab/Simulink", April, 2018

PROFESSIONAL SOCIETIES

- Member of *the Jordan Engineers Association JEA.*

REFERENCES:

Dr. Mohammad Jaradat (Academic Advisor)	- Associate Professor in Mechanical Engineering department at Jordan University of Science and Technology - Professor in Mechanical Engineering department at American University of Sharjah	+971509778030 +962795855233 mjaradat@aus.edu majaradat@just.edu.jo
Dr. Suleiman Alsweiss	Lead Scientist Global Science & Technology Inc. - NOAA/NESDIS/STAR	+13217509564 suleimanalsweiss@gmail.com
Dr. Ahmad Bani Younes	Associate professor Aerospace Engineering department San Diego State University	+18582096414 abaniyounes@sdsu.edu
Dr. Suhil Kiwan	Professor in Mechanical Engineering department at Jordan University of Science and Technology	+962798178983 kiwan@just.edu.jo
Eng. Sanad Haddad	Faculty Member, Department of Mathematics and Computational Thinking KING'S ACADEMY	+962772365569 sanad.a.haddad@gmail.com

ss