OMER **MUJAHID**

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EXPERIENCE

MARCH 2025 – PRESENT

ASSOCIATE RESEARCHER, UNIVERSITY OF GIRONA

- Lead researcher on the Personal Digital Twin project funded by the government of Catalunya.
- Leading the formation of a spinoff company.
- Taking care of grant applications and supervision of PhD students.

SEPT 2023 – MARCH 2025

POSTDOCTORAL RESEARCHER, UNIVERSITY OF GIRONA

- Improving the state of our T1D simulator.
- Leading the formation of a spinoff company.
- Taking care of grant applications and supervision of PhD students.

MAY 2021 - DEC 2021

RESEARCH FELLOW, REGIONAL ACADEMY ON THE UNITED NATIONS (RAUN)

- Project: Contact tracing for COVID-19 in Ukraine: insights from a case study in the region of Chernivtsi
- Agency: WHO Ukraine

SEPT 2018 – AUG 2020

BACHELORS PROGRAM ADVISOR, CECOS UNIVERSITY OF IT & EMERGING SCIENCES

- Delivering student guidance regarding rules and regulations.
- Offering support and guidance to students in the selection of their final year projects.
- Providing career counseling to students.
- Assisting students in managing their health, financial, emotional, and spiritual concerns.
- Conducting regular meetings with students

JUNE 2018 – AUG 2020

POST GRADUATE STUDIES ADVISOR, CECOS UNIVERSITY OF IT & EMERGING SCIENCES

- Providing guidance to postgraduate students regarding their research work.
- Assigning suitable supervisors and facilitating the processing of research theses.
- Streamlining and facilitating the thesis review process.
- Organizing and coordinating thesis defense committees.

SEPT 2013 – AUG 2020

LAB ENGINEER, CECOS UNIVERSITY OF IT & EMERGING SCIENCES

- Teaching simulation and design of signals and systems.

- Delivering comprehensive instruction and demonstrations on the design and analysis of digital filters.

SEPT 2013 – SEPT 2015

COUNSELOR, CECOS'IEEE

- Collaborating with the X-COM (Executive Committee) of the IEEE student branch at CECOS University.
- Providing mentorship to students participating in activities affiliated with the IEEE organization.
- Facilitating the organization of events conducted under the auspices of IEEE.

JAN 2012 – SEPT 2013

TREASURER, CECOS'IEEE

- Managing financial matters, including overseeing earnings from workshops and managing event expenditures.

EDUCATION

SEPT 2020- SEPT 2023

PHD, UNIVERSITY OF GIRONA

Thesis title: Data-driven models for type 1 diabetes using generative deep learning.
Cum Laude

2014-2017

MSC ELECTRICAL ENGINEERING, CECOS UNIVERSITY OF IT & EMERGING SCIENCES

Thesis title: Pattern recognition through a cam-based information detection hardware.
CGPA: 3.38/4.00

2009-2013

BSC ELECTRICAL ENGINEERING, CECOS UNIVERSITY OF IT & EMERGING SCIENCES

Final year project: Face recognition using principal component analysis.
CGPA: 3.10/4.00

2006-2008

HSC, BOARD OF INTERMEDIATE AND SECONDARY EDUCATION PESHAWAR

Subjects: Physics, chemistry, biology, mathematics.
GRADE: A

2004-2006

SSC, BOARD OF INTERMEDIATE AND SECONDARY EDUCATION PESHAWAR

Subjects: Physics, chemistry, biology, mathematics.
GRADE: A+

TECHNICAL EXPERTISE

- Generative deep learning
- Modeling and simulation
- Retrieval Augmented Generation (RAG)
- Machine learning
- Digital Twins
- Reconfigurable computing
- FPGA-based systems

JOURNAL PUBLICATIONS

1. **Omer Mujahid**, Zahid Ullah, Hassan Mahmood, and Abdul Hafeez, "Fast Pattern Recognition through an LBP driven CAM on FPGA", IEEE Access 2018
2. Hassan Mahmood, Zahid Ullah, **Omer Mujahid**, Inayat Ullah, and Abdul Hafeez, "Beyond the Limits of Typical Strategies: Resources Efficient FPGA-based TCAM", IEEE Embedded Systems Letters 2018
3. **Omer Mujahid**, and Zahid Ullah, "High Speed Partial Pattern Classification System using a CAM-based LBP Histogram on FPGA", IEEE Embedded Systems Letters 2019
4. **Omer Mujahid**, Ivan Contreras, Josep Vehi, "Machine Learning Techniques for Hypoglycemia Detection: Trends and Challenges", Sensors 2021
5. Muhammad Ibrahim, **Omer Mujahid**, Najib Ur Rehman, Azhar Qazi, and Zahid Ullah, " An FPGA-Based Accelerated Mutation Detection System for the Tumor Suppressor Gene", IEEE Access 2021
6. Josep Noguer, Ivan Contreras, **Omer Mujahid**, Aleix Beneyto, Josep Vehi. "Generation of Individualized Synthetic Data for Augmentation of the Type 1 Diabetes Data Sets Using Deep Learning Models", Sensors 2022
7. **Omer Mujahid**, Ivan Contreras, Aleix Beneyto, Ignacio Conget, Marga Giménez, and Josep Vehi, "Conditional Synthesis of Blood Glucose Profiles for T1D Patients Using Deep Generative Models", Mathematics 2022
8. Fahad Malook, **Omer Mujahid**, Zahid Ullah, and Tama Fouzder. "On Enhancing the Performance of IEEE 802.11ah by Employing a Dynamic Raw Approach in IoT Networks", Wireless Personal Communications 2023
9. **Omer Mujahid**, Ivan Contreras, Aleix Beneyto, and Josep Vehi, "Generative Deep Learning for the Development of a Type 1 Diabetes Simulator", Communications Medicine 2024
10. Muhammad Bilal, Zahid Ullah, **Omer Mujahid**, and Tama Fouzder, "Fast Linde–Buzo–Gray (FLBG) Algorithm for Image Compression through Rescaling Using Bilinear Interpolation", Journal of Imaging, 2024
11. Amina Sundas, Ivan Contreras, **Omer Mujahid**, Aleix Beneyto, and Josep Vehi, "The Effects of Environmental Factors on General Human Health: A Scoping Review", Healthcare 2024
12. Josep Vehi, **Omer Mujahid**, Aleix Beneyto, Ivan Contreras, "Generative artificial intelligence in diabetes healthcare", iScience 2025
13. Oriol Bustos, **Omer Mujahid**, Ivan Contreras, Aleix Beneyto, Josep Vehi, "Including Aerobic Exercise into Data-Based Virtual Twins for Glycemic Simulation", accepted for publications in Journal of diabetes science and technology, 2025

WORKS SUBMITTED TO CONFERENCES

14. **Omer Mujahid**, Zahid Ullah, Abdul Hafeez, and Tama Fouzder, "Design exploration of LH-CAM with updating mechanism", accepted for publication in IJCCI 2019
15. Najib Ur Rehman, **Omer Mujahid**, Muhammad Irfan, Abdul Hafeez and Zahid Ullah, "Low Power Pre-Comparison Configuration Strategy for a Logic-based Binary CAM on FPGA", published in INTELLECT 2019
16. Najib Ur Rehman, **Omer Mujahid**, Zahid Ullah, Abdul Hafeez, Tama Fouzder, and Muhammad Ibrahim, "Power Efficient FPGA-based TCAM Architecture by Using Segmented Matchline Strategy", published in AECT2019.
17. Ali Mujtaba Durrani, **Omer Mujahid**, Muhammad Uzair, "Micro Hydro Power Plant using Sewage Water of Hayatabad Peshawar", published in ICET 2019
18. **Omer Mujahid**, Ivan Contreras, and Josep Vehi, "Generation of Realistic Virtual Diabetes Patients Using A Pix2pix Gan: In Pursuit Of An Ai-Based Diabetes Simulator", oral presentation in the Virtual Diabetes Technology Meeting 2021 and published in the Journal of Diabetes Science and Technology 2022

19. Josep Noguer, **Omer Mujahid**, Josep Vehi, and Ivan Contreras, “Improvement of The Predictive Ability of Nocturnal Hypoglycemia Models by Using Synthetic Data Created by Generative Adversarial Networks”, poster presentation in the 15th Advanced Technologies & Treatments for Diabetes (ATTD 2022)
20. Oriol Bustos, Júlia Soler, **Omer Mujahid,** Josep Vehí, “Predictive Modeling of Exercise-Induced Glycemic Outcomes Using Generative Deep Learning”, oral presentation in the Virtual Diabetes Technology Meeting 2024 and published in the Journal of Diabetes Science and Technology 2025
21. Josep Noguer, Ivan Contreras, **Omer Mujahid**, and Josep Vehi, “Using conditional generative models to estimate exogenous glucose appearance rates in type 1 diabetes”, poster presentation in the 18th Advanced Technologies & Treatments for Diabetes (ATTD 2025)
22. Elisa Pellizzari, **Omer Mujahid**, Francesco Prendin, Oriol Bustos, Giacomo Cappon, Andrea Facchinetti and Josep Vehi, “Enhancing the Physiological Plausibility of GAN-Generated Blood Glucose in Type 1 Diabetes with Monotonicity Constraints”, accepted for publication in 2025 IEEE International Conference on Metrology for eXtended Reality, Artificial Intelligence and Neural Engineering (MetroXRAINE 2025)

TALKS & WORKSHOPS

1. “Enhancing predictive models thanks to synthetic data”, oral presentation at the 44th International Engineering in Medicine and Biology Conference (EMBC 2022).
2. “Data-based digital twins: From twin cohorts to digital twins”, Mini symposium on "Digital Twins to Transform Personalized Care in Diabetes at the 47th International Engineering in Medicine and Biology Conference (EMBC 2025).
3. “Introductory Talk on Artificial Intelligence in Diabetes Healthcare”, Design Thinking Workshop, Cátedra DEXCOM-UdG Artificial Intelligence in Diabetes, 2025.
4. Expert talk on “AI & Diabetes Management: An Introduction”, International Summer School on AI for Diabetes Management, organized by the UdG–Dexcom Chair for Advancing AI use in Clinical Practice. September 2025.
5. Workshop on “T1D Simulator and Digital Twins for Personalized Care”, International Summer School on AI for Diabetes Management, organized by the UdG–Dexcom Chair for Advancing AI use in Clinical Practice. September 2025.
6. Invited lecture on “Artificial intelligence in diabetes”, Workshop on “AI and Nutrigenetics of Diabetes Mellitus: Beyond Blood Sugar”, Institute of Nutrigenetics. October 2025.

BOOK CHAPTERS

7. Josep Vehi, **Omer Mujahid**, Ivan Contreras. Aim and diabetes. Artificial Intelligence in Medicine. pp. 701 - 709. Springer International Publishing, 2022. ISBN 978-3-030-64573-1
8. Josep Vehi, **Omer Mujahid**, Ivan Contreras. Artificial intelligence and machine learning for diabetes decision support. Advanced Bioscience and Biosystems for Detection and Management of Diabetes. pp. 259 - 272. Springer International Publishing, 2022. ISBN 978-3-030-99728-1

AWARDS & SCHOLARSHIPS

- Received the Best Lab Engineer Award on April 23, 2016 of the Year 2015 from the honorable president of the CECOS University, Peshawar.
- FI Predoctoral Fellowships, Agència de Gestió d'Ajuts Universitaris i de Recerca, Generalitat de Catalunya

GRANTS AWARDED

- Vehicle number plate recognition
  Grant received from National Grassroots ICT Research Initiative 2017-18
- Diseased plant detection through a drone mounted camera
  Grant received from National Grassroots ICT Research Initiative 2019
- Personal Digital Twin: A virtual human twin for therapy adjustment in people with diabetes
  Grant received from Indústria del Coneixement 2024, Agència de Gestió d'Ajuts Universitaris i de Recerca, Generalitat de Catalunya

ADMINISTRATIVE RESPONSIBILITIES

- Coordinator of the summer school on AI in diabetes at the University of Girona
- Postgraduate Studies Advisor
- Councilor IEEE student branch
- Member of the program team for preparation of self-assessment report (SAR) for MS and PhD Programs
- Member of the examination panel for the assessment of Final Year Projects
- Organizer and member of the program committee at IEEE ICET (International Conference on Emerging Technologies), held on 19-20 December 2015 in Peshawar, Pakistan
- Industry academia linkage head in Open House 2019 held on 18 September, 2019
- Presented the updated curriculum of MS Electrical Engineering Program at the Board of Studies meeting held on 8 November, 2019
- Convener of the committee formed to design the Handbook for postgraduate students

OTHER TECHNICAL PROJECTS PERFORMED

- Face Recognition Technology Using MATLAB
- Content addressable memory design in Verilog HDL
- A fast pattern recognition system using content addressable memory
- Speech Recognition in MATLAB
- Signal Separation using Digital Filters in LabVIEW
- Design and implementation of a low voltage audio amplifier using LM386
- Generation of DTMF in LabVIEW using the Speedy33 DSP Kit.
- Design and test of music equalizer using the DSK 6416.
- Implementation of Digital Audio effects using Speedy33 DSP kit.
- Designing and simulating a Modem using DSK6416.
- LH-CAM design in Verilog
- Noise cancellation using MATLAB
- Validation memory design in Verilog
- Fast Pattern Recognition through CAM

UNDERGRADUATE PROJECTS SUPERVISED

- Developing a GAN-Based Blood Glucose T1D Outcome Prediction Model for Clinical Use, 2024/2025
- Programació d'un simulador de dades de pacients amb diabetis per aplicacions en bioinformàtica 2020/2021
- A smart ECG platform using Deep Learning, 2019/2020
- Internet packet classification using a CAM based Hamming Distance Calculator on FPGA, 2019/2020
- Neural Networks implementation on FPGA, 2019/2020
- A novel distance calculation method for image classification on FPGA using TCAM, 2018/19
- Diseased plant detection through a drone mounted camera, 2018/19
- Deep learning through MATLAB, 2017/18
- Pattern Recognition through CAM, 2016/17
- Exoskeleton, 2016/17
- Industrial Automation through PLCs, 2016/17
- Dress Measurement Application, 2015/16
- My Team Society Application, 2015/16
- Automatic Car Control, 2015/16
- A multilevel Advanced Security System, 2015/16
- Object following robot using OpenCV, 2015/16
- UHF/VHF Jammer, 2014/15