SAMOUA ALSAMOUA

Date of birth: 03/01/1998 | **Nationality:** Syrian | **Phone number:** (+90) 5528878440 (Mobile) | **Email address:**

samoua.alsamoua@gmail.com | **Website:** https://samoua-alsamoua.github.io/saalsamoua/ | **LinkedIn:**

www.linkedin.com/in/samoua-alsamoua | **Address:** 61000, Trabzon, Türkiye (Home)

• EDUCATION AND TRAINING

01/09/2022 – CURRENT Trabzon, Türkiye
MSC IN SOFTWARE ENGINEERING: ARTIFICIAL INTELLIGENCE, DEEP LEARNING AND HEURISTIC ALGORITHMS Karadeniz Technical University

Website https://www.ktu.edu.tr/ | **Field of study** Software and applications development and analysis | **Final grade** 3,36 |

National classification 1 |

Thesis Improved Weighted Chimp Optimization Algorithm based on Fitness-Distance Balance for Multilevel Thresholding Image Segmentation

15/08/2015 – 01/07/2020 Latakia, Syria
BSC IN TELECOMMUNICATION AND ELECTRONICS ENGINEERING Tishreen University

Website https://tishreen.edu.sy/ | **Field of study** Information and Communication Technologies | **Final grade** 88.80 |

National classification 2 |

Thesis Design and Implementation of an SDN Network for Tishreen University Using HPE-VAN Controller and OpenFlow Protocol

2025
FINE-TUNING FOR LLMS: FROM BEGINNER TO ADVANCED Linkedin Learning

2025
INTRODUCTION TO LARGE LANGUAGE MODELS Linkedin Learning

Website https://www.linkedin.com/learning/certificates/
23811a486ae7d6faa2a3dbaa143cef6524d5ad84fa709c0469e76a48259943f4?trk=share_certificate

2025
5G NETWORK ARCHITECTURE AND PROTOCOLS Linkedin Learning

Website https://www.linkedin.com/learning/certificates/
68709d56faa5cfc90cad5f7ec5f78e12838927e3ab12d8f8370efbe7498d4eab

2025
INTRODUCTION TO 5G Linkedin Learning

Website https://www.linkedin.com/learning/certificates/
d89f415e4ca7418540c2a5d39e5fee35265e16963764274936fcdc9528a35285

2025
LEARNING GRAPH NEURAL NETWORKS Linkedin Learning

Website https://www.linkedin.com/learning/certificates/
44be4ac5e444be77e861afca3e0caa6d836d6c9abad8d0965a50b11f0e7c2b69

THE COMPLETE 2022 FLUTTER & DART DEVELOPMENT COURSE [ARABIC] Udemy.com

Website https://www.udemy.com/course/complete-flutter-arabic

FLUTTER CLEAN ARCHITECTURE [2022] [FLUTTER 3] (IN ARABIC) Udemy.com

Website https://www.udemy.com/course/flutter-clean-architecture-2022-flutter-3-in-arabic

WORK EXPERIENCE

01/02/2020 – 15/09/2021 Latakia, Syria
LECTURER BIT INSTITUTE

As a lecturer in Telecommunication and Electronics Engineering, I was responsible for delivering high-quality instruction in subjects like Cellular Systems, Computer Networks and Protocols, and Network Programming using Python. My role involved preparing and updating course materials, conducting practical lab sessions, and mentoring students on academic projects and career pathways.

LANGUAGE SKILLS

Mother tongue(s):   **ARABIC**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C2	C1	C1	C2
TURKISH	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Telecommunication Systems

Analog and digital modulation ｜ Mobile Network (GSM, UMTS, LTE, 5G, WiFi e WiMax) ｜ MIMO Technology and Beamforming ｜ Digital Signal Processing (DSP) ｜ Fiber Optic Networks ｜ Radar and Microwave Transmission Systems ｜ VoIP

Networking

CCNA R & S ｜ TCP/IP ｜ QoS ｜ OSI model ｜ Routing and Switching Protocols

Programming Languages

Python ｜ MATLAB ｜ C/C++ ｜ Dart ｜ Java

Wireless Protocols

IEEE 802.11 ｜ IEEE 802.15.4 ｜ WiFi ｜ Bluetooth (Classic and BLE) ｜ Zigbee

IoT

IoT Protcol Stack ｜ IoT Protocols ｜ Wireless Communication for IoT Devices (Wi-Fi, Zigbee, LoRa, Bluetooth)

Artificial Intelligence and Deep Learning

AI Training Techniques ｜ AI Algorithms (Optimization) ｜ TensorFlow ｜ PyTorch ｜ Keras ｜ OpenCV ｜ Neural Networks (CNN, RNN) ｜ Pandas ｜ Numpy ｜ Google CoLab

Software Defined Networks (SDN)

OpenFlow Protocol ｜ SDN Controllers ｜ HPE VAN Controller ｜ Opendaylight Controller

Mobile and Web App Development

Flutter ｜ State Management (Bloc, Getx) ｜ Backend Integration ｜ Testing and Debugging Applications ｜ VS Code

Large Language Models (LLMs)

Prompt Engineering & ｜ Reinforcement Learning with Human Feedback (RLHF) ｜ NLP ｜ Transformers ｜ LoRA ｜ Transfer Learning ｜ Fine-tuning

PUBLICATIONS

2025

[An Improved Weighted Chimp Optimization Algorithm Using Fitness-Distance Balance for Multilevel Image Thresholding Segmentation (Turkish version))](#)

2025

An Improved Weighted Chimp Optimization Algorithm Using Fitness-Distance Balance for Multilevel Image Thresholding Segmentation (Under Review)

2025

Design of a Multistage Hybrid Optimization Algorithm (MFO-PSO-SSA) for Multilevel Thresholding-Based Image Segmentation: An Experimental Study

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Is expected to be published soon.

- **PROJECTS**

10/02/2025 – 15/02/2025
AI-Driven Prediction of 5G Network Traffic Patterns

Objective : The objective of this project was to develop a predictive model for 5G network traffic using synthetic data and an LSTM (Long Short-Term Memory) neural network. The goal was to forecast traffic volume over time, enabling proactive network management and resource allocation to ensure optimal performance.
Results :
- Successfully generated synthetic 5G network traffic data with realistic patterns, including trends, seasonality, and random noise, to simulate real-world scenarios.
- Preprocessed the data by normalizing it and creating time-series sequences suitable for training a deep learning model.
- Built and trained an LSTM-based model to predict future traffic volumes, achieving strong performance metrics such as Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE).
- Demonstrated the model's ability to accurately forecast traffic patterns, which can be applied to optimize network resource allocation, reduce congestion, and improve user experience.

Skills : Python, TensorFlow, Keras, LSTM Networks, Time Series Forecasting, Data Preprocessing, Synthetic Data Generation, Pandas, NumPy, Matplotlib, Scikit-learn, Model Evaluation (MAE, RMSE), GPU Acceleration.

10/01/2025 – 13/01/2025
Object Detection with YOLOv5 for Images and Videos

Objective : The objective of this project was to develop an efficient and real-time object detection system using the YOLOv5 (You Only Look Once) architecture. The goal was to create a model capable of accurately detecting and classifying objects in both static images and dynamic video streams, with a focus on achieving high speed and precision for real-world applications.
Results : The project successfully implemented a YOLOv5 model that demonstrated strong accuracy and real-time performance in detecting objects across multiple classes. The model was optimized to handle complex scenarios, such as varying object sizes, occlusions, and cluttered backgrounds, while maintaining fast inference speeds suitable for real-time applications.
Skills : TensorFlow, PyTorch, OpenCV, Computer Vision, Object Detection, Image and Video Processing, Model Optimization, Transfer Learning, Python, Data Augmentation, Bounding Box Regression, GPU Acceleration.

01/01/2025 – 10/01/2025
Object Detection with Faster R-CNN and COCO Dataset

Objective : The objective of this project was to develop an object detection system using the Faster R-CNN architecture trained on the COCO (Common Objects in Context) dataset. The goal was to build a robust model capable of accurately detecting and classifying multiple objects within complex and diverse real-world images and videos.
Results : The project successfully implemented a Faster R-CNN model that achieved high precision and recall in detecting objects across 80 categories in the COCO dataset. The model demonstrated strong performance in handling challenging scenarios such as occlusions, varying object sizes, and cluttered backgrounds. These results highlighted the model's potential for real-world applications, including autonomous driving, surveillance systems, and image-based search engines.
Skills : TensorFlow, PyTorch, OpenCV, Computer Vision, Object Detection, Image and Video Processing, Model Optimization, Transfer Learning, Python, Data Augmentation, Bounding Box Regression, GPU Acceleration.

20/01/2025 – 25/01/2025
Text Summarization and Translation Model using the T5 Transformer

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Objective : The objective of this project was to develop a machine learning model capable of performing both text summarization and translation tasks using the T5 (Text-to-Text Transfer Transformer) architecture. The goal was to create an efficient, scalable solution for generating concise summaries while retaining key information and translating text across multiple languages with high accuracy.

Results : Successfully implemented a unified model that achieved high accuracy in both summarization and translation tasks.

Skills: TensorFlow, PyTorch, Hugging Face Transformers, Fine-tuning Pre-trained Models, Natural Language Processing (NLP), Text Summarization, Machine Translation, Tokenization, Pandas, NumPy.

01/12/2024 – 01/01/2025

Design of a Multistage Hybrid Optimization Algorithm (MFO-PSO-SSA) for Multilevel Thresholding-Based Image Segmentation

Objective: The project aims to design a hybrid algorithm combining MFO, PSO, and SSA for multilevel thresholding-based image segmentation. The goal is to optimize threshold values for accurate image partitioning while addressing challenges like noise and computational complexity.

Results: The MFO-PSO-SSA algorithm achieves superior segmentation accuracy and faster convergence compared to individual optimization methods. It demonstrates robustness against noise and local minima, producing high-quality segmented images suitable for applications like medical imaging and satellite analysis.

Skills: Image processing, Meta-heuristic Optimization Algorithms, Algorithm Design and problem-solving,

01/10/2024 – 01/11/2024

A Novel Hybrid Meta-Heuristic Algorithm: Integrating Moth-Flame Optimization (MFO) and Cuckoo Search (CS) for Enhanced Optimization Performance

Objective: The objective of this project was to develop a hybrid meta-heuristic algorithm by combining the Moth-Flame Optimization (MFO) and Cuckoo Search (CS) algorithms. The goal was to leverage the strengths of both algorithms to create a more efficient and robust optimization technique for solving complex problems.

Results: The hybrid MFO-CS algorithm was successfully developed, combining the strengths of both Moth-Flame Optimization and Cuckoo Search. It demonstrated faster convergence and higher solution accuracy compared to the individual MFO and CS algorithms. The hybrid algorithm showed robustness and adaptability across various optimization problems. Benchmark testing confirmed its superior performance in terms of efficiency and reliability.

Skills: Meta-heuristic Algorithms, Hybrid Algorithm Design, Optimization Techniques, MATLAB, Benchmark Testing, and Problem-Solving.

01/02/2023 – 01/04/2023

Brain Tumor Detection and Segmentation Using Mask R-CNN Algorithm

Objective: The goal of this project is to detect and segment brain tumors in medical images using the Mask R-CNN algorithm. The aim is to create an automated system that accurately identifies tumor regions to assist in diagnosis and treatment planning.

Results: The Mask R-CNN model successfully detected and segmented brain tumors with high precision. It achieved a strong Intersection over Union (IoU) score, demonstrating its ability to accurately outline tumor boundaries. The model also showed good generalization on unseen data, making it suitable for real-world applications.

Skills: Mask R-CNN, Python, TensorFlow/Keras, Image Processing, Model Evaluation, Deep Learning, OpenCV, and Medical Imaging.

01/11/2022 – 01/01/2023

Enhancing the Weighted Chimp Optimization Algorithm (WChOA) Using Fitness-Distance Balance (FDB) for Improved Optimization Performance

Objective: The objective of this project was to enhance the performance of the Weighted Chimp Optimization Algorithm (WChOA) by integrating the Fitness-Distance Balance (FDB) approach. The goal was to improve the algorithm's efficiency, convergence speed, and solution accuracy for solving complex optimization problems.

Results: The enhanced WChOA algorithm achieved faster convergence and higher accuracy in solving optimization problems. It outperformed the original version in benchmark testing and demonstrated greater robustness.

Skills: Meta-heuristic Algorithms, Fitness-Distance Balance (FDB), Optimization Techniques, MATLAB, Algorithm Design, Benchmark Testing, and Problem-Solving.

01/11/2022 – 01/12/2022

Copy-Move Forgery Detection in Digital Images Using DWT, SIFT, and RANSAC Algorithms

Objective: The objective of this project was to develop a robust method for Copy-Move Forgery Detection in digital images using Discrete Wavelet Transform (DWT), Scale-Invariant Feature Transform (SIFT), and RANSAC algorithms. The goal was to create a technique capable of detecting forged regions even under challenges like geometric transformations (scaling, rotation), blurring, noise addition, and JPEG compression.

Results: The project successfully implemented a robust copy-move forgery detection system using DWT, SIFT, and RANSAC algorithms, effectively identifying forged regions even in images with geometric transformations, blurring, noise, and JPEG compression. The method demonstrated resilience against post-processing operations and achieved a practical balance between accuracy and time complexity.

Skills: Image Processing, Copy-Move Forgery Detection, Discrete Wavelet Transform (DWT), Scale-Invariant Feature Transform (SIFT), RANSAC Algorithm, Geometric Transformations, JPEG Compression, and Problem-Solving.

01/2020

OFDM vs GFDM vs FBMC Comparison under Multipath Fading

Objective: The objective of this project is to compare the performance of Orthogonal Frequency Division Multiplexing (OFDM), Generalized Frequency Division Multiplexing (GFDM), and Filter Bank Multi-Carrier (FBMC) under multipath fading conditions. The study focuses on evaluating key performance metrics such as Bit Error Rate (BER), spectral efficiency, and out-of-band (OOB) emissions. The goal is to analyze the strengths and weaknesses of each modulation technique in modern wireless communication systems, particularly for 5G and beyond applications.

Results: The results indicate that OFDM performs well in terms of spectral efficiency but suffers from high OOB emissions and sensitivity to multipath fading. GFDM demonstrates improved flexibility and reduced OOB emissions compared to OFDM, making it suitable for diverse 5G use cases. FBMC exhibits superior performance in multipath fading environments due to its robustness against inter-symbol interference (ISI) and excellent spectral containment, but at the cost of higher computational complexity. Overall, the choice of modulation depends on the specific requirements of the communication system.

Skills: Advanced Wireless Communication Techniques, Signal Processing, and Modulation Schemes like OFDM, GFDM, and FBMC.

2019

Spectral Efficiency Comparison of NOMA and OFDMA

Objective: The objective of this project is to compare the spectral efficiency of Non-Orthogonal Multiple Access (NOMA) and Orthogonal Frequency Division Multiple Access (OFDMA) in modern communication systems. The study focuses on evaluating how these multiple access techniques perform under varying Signal-to-Noise Ratio (SNR) conditions and user density scenarios. Key performance metrics include spectral efficiency, fairness among users, and overall system throughput. The goal is to analyze the trade-offs between NOMA's ability to support more users simultaneously and OFDMA's simplicity and robustness.

Results: The results show that NOMA outperforms OFDMA in spectral efficiency, especially in high user density scenarios, by serving multiple users simultaneously. However, NOMA's complexity increases due to power allocation and interference cancellation requirements. OFDMA offers simplicity and fairness but is less spectrally efficient.

Skills: Advanced Wireless Communication Techniques, Signal Processing, and Resource Allocation.

2019 – 2020

Design and Implementation of an SDN Network for Tishreen University Using HPE-VAN Controller and OpenFlow Protocol (BSc Thesis)

Objective: The objective of this project was to study Software-Defined Networking (SDN) technology and design a practical SDN network for Tishreen University using the HPE-VAN Controller and OpenFlow Protocol. The goal was to create a scalable, efficient, and manageable network infrastructure to meet the university's needs.

Results: The project successfully designed and implemented an SDN network for Tishreen University using the HPE-VAN Controller and OpenFlow Protocol, achieving centralized network management, improved scalability, and enhanced flexibility. The solution demonstrated efficient traffic routing, reduced network complexity, and provided a cost-effective, future-proof infrastructure for the university.

Skills: SDN Technology, HPE-VAN Controller, OpenFlow Protocol, Network Design, Network Management and Scalability.

2019

Bit Error Rate and Spectral Efficiency Comparison of BPSK, QPSK, QAM, and OFDM in Modern Communication Systems

Objective: The objective of this project is to implement and compare the performance of traditional (BPSK, QPSK) and advanced (16-QAM, 64-QAM, OFDM) modulation techniques under varying Signal-to-Noise Ratio (SNR) conditions. The focus is on evaluating their Bit Error Rate (BER) and spectral efficiency to determine the trade-offs between reliability and data rate in modern communication systems.

Results: The results show that BPSK performs best in low SNR environments with minimal BER but has low spectral efficiency. QPSK offers a balance between reliability and efficiency, while higher-order QAM techniques (16-QAM, 64-QAM) provide superior data rates at the cost of increased BER in noisy conditions. OFDM demonstrates robustness against multipath fading, making it suitable for high-speed wireless communications.

Skills: Digital communication systems, Signal Processing, and Modulation Techniques.

● HONOURS AND AWARDS

01/09/2020
Al-Basel Certificate for Second Graduate – Tishreen University

The most important academic excellence certificate in Syria for Graduates. Final GPA: 88.80%.

Al-Basel Certificate for the Distinguished in Academic Study (Second, Third and Fourth Year) – Tishreen University

2017, 2018, 2019.
The most important academic excellence certificate in Syria.