Roudy Barakat

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PROFILE SUMMARY

Computer and Communication Engineering student specializing in Artificial Intelligence and Networking. Experienced with deep learning, LLMs, RAG pipelines, and U-Net segmentation for applied AI solutions. Skilled in machine learning for cybersecurity, intrusion detection, and traffic analysis, integrating intelligent systems with modern network defense. Cisco Networking Academy-certified with hands-on expertise in multi-site network design, routing (OSPF, BGP), and security mechanisms.

EDUCATION

Lebanese University – Faculty of Engineering, Hadath-Beirut
Computer and Communication Engineering
Oct 2021 – Present | GPA: 87.05/100

RELEVANT COURSEWORK

Network Design | Internet Protocols and Architecture | Routing and Switching | Redundancy network | Vlans | Trucking | Spanning Trees | Network Security | DHCP Servers | Telecommunications Systems | High-Speed Networks | Quality of Service (QoS) | Automation, Control and Security Systems | Digital Signal Processing| Image Processing| Neural Network| Machine Learning.

PROFESSIONAL EXPERIENCE

Make Data Count Competition – *Kaggle (AI Competition)* Jul 2025 – Sep 2025

- Implemented **structured output handling with Pydantic models**, ensuring schema validation and reliable LLM responses.
- Applied **LLM + RAG pipelines**, **NER fine-tuning**, and **classical ML models** to detect and classify dataset mentions.
- Utilized **embeddings** for semantic search and clustering.
- Tech stack: **Python, PyTorch, Hugging Face, Scikit-learn, Pandas, Pydantic, spacy, sentence-transformer**.

National Center for Remote Sensing (CNRS) – *AI Engineer Internship*
Greenhouse segmentation project(used later for greenhouses area calculation in Lebanon)

- Building and cleaning dataset
- Building Image segmentation neural network models (U-Net, DeepLabv3+)

CNS Solid Network (ICC group)–*Networking Intern* Jul 2025 – Aug 2025

- CCNP course
- Knowledge: SD-WAN, SD-ACCESS, QoS, BGP, LISP, VXLAN

Terra net–*Network Engineer Trainee*

Jul 2024 – Sep 2024

- Network Design and implementation.
- End Point Security Redundancy.
- Configuration Routing Protocols configuration (OSPF,BGP,static).
- Troubleshooting.

Contact: NOC manager Eng. Mohammad Ajram

Barakat Tech – *Network Engineer* Assistant 03/2024 – 04/2024

- Knowledge in Company Network Installation.
- Access Point Configuration.

Contact: Eng. Sari Barakat Phone: +961 70 082456

Walima Catering – *Waiter* Oct 2020 – Dec 2023

- Team Leadership and Execution.

TECHNICAL SKILLS

Networking & Security

- **Protocols:** OSPF, BGP, NAT (Static, Dynamic, PAT), VLANs, DTP, TCP/IP, WAN, DHCP, QoS, LISP, CAPWAP, VRF, GRE, STP, RSTP, MSTP, FHRP, SNMP, Inter-VLAN, EtherChannel, VXLAN
- **Security & Access Control:** AAA, ACL, ASA, Authentication, Layer 2 Security, IPS, IDS, Firewall, Site-to-Site IPsec VPN, Zone-Based Policy Firewall, Layer 2 Security Mitigation
- **Tools & Systems:** Cisco Routers/Switches, Linux, Windows, Nmap, Wireshark, SQLMap, Burp Suite

Machine Learning & AI & Natural Language Processing (NLP)

- **Models:** Decision Trees, Support Vector Machines (SVM), Neural Networks (MLP, CNN), U-Net, DeepLabv3+
- **Learning Approaches:** Supervised Learning, Unsupervised Learning
- Named Entity Recognition (NER), NER Fine-tuning, Regex-based Information Extraction
- Sentence Tokenization (NLTK, spaCy)
- Large Language Models (LLMs), Retrieval-Augmented Generation (RAG), Embeddings
- Llama-index, lang-chain

Computer Vision & Image Processing

- OpenCV, MediaPipe, TensorFlow Lite, Image Segmentation, Object Detection

Data Science & Analytics

- Pandas, NumPy, Matplotlib
- Data Cleaning, Feature Engineering, Model Evaluation

Programing Languages

- Python, C#, C++, java

Libraries & Frameworks

- scikit-learn, PyTorch, TensorFlow, Hugging Face Transformers, Sentence-Transformers

Tools & Platforms

- Packet Tracer, QGIS, Proteus, MPLAB, ADS, Microsoft Excel, MATLAB, Grobid, Docker, Github, git

PROJECT EXPERIENCE

Green Houses Segmentation Project: ***Aug 2025 – Sep 2025***

- Working with a team for preparing a pipeline for the project
- Building and cleaning Greenhouse's dataset with labeling (Using Satellite Images, Robowflow Website)
- Applying neural networks models like U-Net, DeepLabv3+ as a semi-supervised learning that helps for labeling to increase the size of training dataset

Scientific Data Citation Extraction and Classification *Jul 2025 – Sep 2025*
Kaggle Competition: Make Data Count

- Designed and implemented **Large Language Model (LLM) pipelines** with **Retrieval-Augmented Generation (RAG)** and **vector indexing** to classify dataset mentions in scientific articles.
- Applied **prompt engineering techniques** and used **Pydantic models** for structured output validation and schema enforcement.
- Developed and fine-tuned **Named Entity Recognition (NER) models** for **Natural Language Processing (NLP)** tasks using deep learning frameworks.
- Built **classical machine learning models** (CatBoost) for dataset classification.
- Leveraged **embeddings and semantic similarity search** for dataset identification and clustering.
- Conducted **data preprocessing, feature engineering.**

Machine Learning Based Intrusion Detection System (IDS) on Raspberry Pi ***Jun 2025 – Jun 2025***

- Designed and deployed a lightweight, real-time IDS using a Raspberry Pi and Linux.
- Captured live traffic via Scapy; engineered flow-based features from raw packets.
- Built and optimized ML models (Random Forest, SVM, MLP) for anomaly detection.
- Built MLP neural network with accuracy 97%.
- Integrated live classification, logging, and optional dashboard alert system.

Advanced Multi-Site Network Architecture ***Jun 2025 – Aug 2025***

- Deployed a full-scale multi-area OSPF network with static/Dynamic NAT, PAT, BGP.
- Configured centralized DHCP, DNS, VLANs, access control lists.
- Implemented multi-layer security protocols and routing policies.

3 Modes Arduino Car Controlled ***03/2024 –06/2024***

- **Smartphone-Controlled Mode:** Uses a mobile application to operate the car, similar to a remote-controlled car but controlled via a smartphone.
- **Autonomous Mode:** Utilizes an ultrasonic distance sensor, allowing the Arduino car to navigate and avoid obstacles independently without human intervention.

- **Hand Gesture Control Mode:** Employs OpenCV and MediaPipe to interpret hand gestures for controlling the car's movements.

VOLUNTEER EXPERIENCE

First Responder Team ***02/2025 – Present***

CERTIFICATIONS

CISCO Certificates

- Cisco Network Security 04/2024-07/2025
- Cisco Certified Network Associate (CCNA v7 Enterprise Networking, Security, and Automation (10/2024 - 03/2025)
- Cisco Certified Network Associate (CCNA v7 Switching, Routing and Wireless Essentials) (02/2024 - 07/2024)
- Cisco Certified Network Associate (CCNA v7 ITN) (11/2023 - 01/2024)

LANGUAGES

- **Arabic** Native or Bilingual Proficiency
- **English** Full Professional Proficiency
- **French** Full Professional Proficiency