

# Roudy Barakat

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## PROFILE SUMMARY

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Machine Learning Engineer and CCE student specializing in the intersection of Artificial Intelligence and Cybersecurity. Proven expertise in designing hybrid threat detection systems using Deep Learning (Transformers, CharCNN) and classical ML. Strong foundation in Network Engineering (Cisco Networking academy certified, CCNP trained) allowing for the development of AI-driven network defense solutions. Skilled in LLM pipelines, RAG, and Computer Vision, with a track record of deploying scalable models for real-world applications.

## EDUCATION

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

## PROFESSIONAL EXPERIENCE

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### Chimera CyberSecurity – Machine Learning Engineer

Oct 2025 -Present

- **Developed and optimized machine learning models** for anomaly and threat detection, utilizing both classical algorithms and Deep Learning approaches.
- **Designed comprehensive data preprocessing pipelines**, implementing cleaning, and transformation techniques to prepare complex datasets for training.
- Engineered hybrid feature sets
- **Leveraged Transformer-based architectures** and neural networks to analyze sequential data, enhancing the detection of complex behavioral patterns.
- **Conducted extensive model experimentation and benchmarking**, training various architectures to select the optimal balance between accuracy and performance.

### AI Researcher & Competitor (Make Data Count) Kaggle

Jul 2025 – Sep 2025

- Designed robust LLM pipelines utilizing RAG (Retrieval-Augmented Generation) and vector indexing to accurately classify and extract dataset mentions from scientific literature.
- Implemented structured data extraction using Pydantic models to enforce schema validation on LLM outputs, ensuring reliable downstream processing.
- Fine-tuned Named Entity Recognition (NER) models and deployed classical classifiers (CatBoost) to enhance citation discovery rates.
- *Tech Stack:* Python, PyTorch, Hugging Face, LangChain, FAISS.

### Machine Learning Engineer Intern National Center for Remote Sensing (CNRS) | Aug 2025 – Sep 2025

- Developed high-precision semantic segmentation models (U-Net, DeepLabv3+) to automate the detection and area calculation of greenhouses across Lebanon.
- Curated and annotated large-scale satellite imagery datasets using Roboflow, implementing rigorous data cleaning protocols to ensure ground-truth accuracy.
- Deployed semi-supervised learning techniques to expand the training dataset effectively,

improving model generalization on unseen geographic regions.

### **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

## **TECHNICAL SKILLS**

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### **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 & Deep Learning:**

- **Architectures:** Transformers ,CNN (including CharCNN), MLP, U-Net, DeepLabv3+.
- **Algorithms:** Histogram-based Gradient Boosting, Decision Trees, Support Vector Machines (SVM).
- **Concepts:** Supervised & Unsupervised Learning, Anomaly Detection, Feature Engineering.

### **Generative AI & LLMs:**

- **Frameworks:** LangChain, LlamaIndex.
- **Techniques:** Retrieval-Augmented Generation (RAG), LLM Fine-tuning, Vector Embeddings.

### **Natural Language Processing (NLP):**

- **Tasks:** Named Entity Recognition (NER), Sequence Classification, Regex-based Information Extraction.
- **Libraries:** NLTK, spaCy.
- **Preprocessing:** Sentence Tokenization, Text Cleaning

## Computer Vision & Image Processing

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

## Data Science & Analytics

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

## Programming 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.

### *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.

## **CERTIFICATIONS**

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### **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**

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