Mortaza **Hassani**

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Education

Université Libre de Bruxelles (ULB) — *Brussels, Belgium*
M.S. Cybersecurity, IoT Specialization (M2) — *Sept 2024 - Sept 2025*
Thesis: – To Be Decided –

Université Bretagne Sud (UBS) — *Lorient, France*
M.S. Cybersecurity, IoT Specialization (M1) (GPA: 15.81/20 | 1st Position) — *Sept 2023 - July 2024*

Mohammad Ali Jinnah University (MAJU) — *Karachi, Pakistan*
B.E. Computer Systems Engineering (GPA: 3.87/4,00 | Gold Medalist | 1st Position) — *Sept 2019 - July 2023*
Thesis: Robotic Control System using Computer Vision on Embedded System

Research Interests

Design & Security of Embedded Systems, Internet of Things, System-on-Chip Security, Wireless Communication, Hardware Security, AI/ML Development and Application, Robotics, Computer Vision, FPGA

Skills

Core Skills	Embedded Systems, Cybersecurity, Artificial Intelligence, Machine/Deep Learning, Network, Linux , SoC Design, IoT Development, Web Development
Security & Analysis	Vulnerability Assessment, Reconnaissance, Penetration Testing, Threat Modeling, Malware & Reverse Engineering, Secure Coding, Cryptography
Programming	Python, C++, C, Bash, Java, PHP, HTML/CSS, SQL, Verilog, SystemVerilog
Soft Skills	Problem-Solving, Project Management, Leadership, Team Collaboration, Effective Communication, Planning, Delivering Results, Agility, Autonomy
Tools	Git, VS Code, TensorFlow, PyTorch, BurpSuite, LiteX, Vivado, Matlab, PlatformIO, Wireshark, AWS, Azure, NMAP, ZAP, Ghidra, UML, Markdown, LaTex

Work Experience

Cybersecurity Intern - Offensive Tool for Studying SoC Communication Interfaces — *Lorient, France*
Lab-STICC - ARCAD — *Apr. 2024 - June 2024*
Contributed in research and studying the development of offensive tools to analyze System-on-Chip (SoC) communication interfaces using LiteX framework.:

- Developed and implemented a System-on-Chip (SoC) on an FPGA board using the LiteX framework.
- Generated SoC using C and Python for SoC definition and configuration.
- Successfully integrated UART, SPI and I2C communication cores on SoC for sniffing purposes.
- Researched comprehensive security assessments and formulated recommendations for enhancements.

Design Engineer — *Karachi, Pakistan*
Lambda Theta — *Apr. 2022 - Aug. 2023*
Constructed test environments/units using UVM and OpenFPGA to create customized FPGA architectures:

- Utilized Verilog, VHDL, and C++ to develop and test designs, ensuring compatibility across platforms.
- formulated SystemVerilog for testbench creation for the verification of designs.
- Achieved improvements in synthesis and performance through developed prototypes.

Computer Vision Intern — *Karachi, Pakistan*
Lambda Theta — *July 2021 - Oct. 2021*
Engineered human and object detection algorithms using TensorFlow and OpenCV:

- Enhanced real-time processing capabilities on RaspberryPi, resulting in detection speed and reliability.
- Integrated an industrial object detection algorithm incorporating volumetric calculations to enhance spatial analysis and efficiency. Integrated the algorithm into a courier company's workflow.
- Systematized extensive testing and validation to ensure robust performance in various environments.

Teaching Experience

Mohammad Ali Jinnah University *Karachi, Pakistan*

Teacher Assistant *Sept 2022 - Jan. 2023*

Facilitated lab sessions for undergraduates focused on FPGA-based system design and implementation. Provided hands-on guidance for configuring FPGAs, designing digital circuits, and troubleshooting hardware. Reinforced theoretical concepts through practical applications, enhancing students' proficiency in FPGA technology.

International Assistance Mission *Herat, Afghanistan*

Computer Instructor *Apr. 2017 - June 2017*

Taught database management, data entry, record keeping, and report generation to IAM's staff and employees. Developed and delivered comprehensive training sessions on querying databases and generating reports. Provided hands-on training and support to ensure staff proficiency in using database management systems.

Honors & Awards

2024 **Gold Medalist** , Academic Award , Mohammad Ali Jinnah University *Karachi, Pakistan*
Highest Academic Achievement and 1st Position In Computer Engineering Department Batch 2019.

2023 **Erasmus Mundus Joint Master Degree Scholarship** , Merit Award "CYBERUS *France, Estonia, Belgium*
Shortlisted & Selected Among 480+ International Applicants .

2024 **Embedded CTF Runner-Up**, CYBERUS Spring School *Lorient, France*
2023 **Best Engineering Project**, FYP Project Exhibition, Mohammad Ali Jinnah University *Karachi, Pakistan*
2022 **Chancellor Honor Roll List**, Academic Achievement Ceremony *Karachi, Pakistan*
2021 **1st Position Samsung Innovation Campus - AI**, SAMSUNG & MAJU *Karachi, Pakistan*
2021 **Chancellor Honor Roll List**, Academic Achievement Ceremony *Karachi, Pakistan*
2020 **Chancellor Honor Roll List**, Academic Achievement Ceremony *Karachi, Pakistan*

Projects

[P1] **RoboPot: Autonomous Golf Ball Potting Robot**
Designed and developed an autonomous robot aimed at enhancing precision in golf ball potting. The system integrated a PID controller for precise movement control, computer vision algorithms for target detection, and a Raspberry Pi as the central processing unit. Communication between components was facilitated through the MQTT protocol, with a NodeMCU managing the actuation mechanisms.
1st place in the Final Year Project (FYP) exhibition

[P2] **Real-Time Exchange Rate Display**
Engineered an embedded system with an HDMI interface for displaying real-time exchange rates. Developed using Qt for the GUI, incorporating web scraping for data retrieval. Connected to AWS and Firebase for data management and cloud operations. Real-time updates were sent to Telegram and WhatsApp channels for continuous access.

[P3] **Cryptocurrency Price Forecasting using Machine Learning (LSTM)**
Developed a deep learning model using Long Short-Term Memory (LSTM), a specialized type of recurrent neural network (RNN), to forecast cryptocurrency prices. Leveraged LSTM's ability to capture long-term dependencies in sequential data, making it well-suited for time-series analysis. The project aimed to improve the accuracy of cryptocurrency price predictions, offering valuable insights for financial decision-making and market analysis.
1st place in SAMSUNG Innovation Campus - AI

[P4] **IoT-Enabled Campus Scheduling System**
Developed a web-scheduled campus bell alarm system for Mohammad Ali Jinnah University using NodeMCU modules and a Raspberry Pi. Designed a web interface for schedule management, with data and control functionalities hosted on Google Firebase. This IoT solution enabled automated and precise schedule control.

Certifications

2024 **LFEL1010: XSS Exploits and Defenses**, The Linux Foundation
2024 **Postman API Fundamentals Student Expert**, Postman
2023 **Google IT Automation with Python specialization**, Coursera & Google
2022 **7th International Entrepreneurship Summer School**, IBA – Center for Entrepreneurial Development — *IBA - Karachi, Pakistan*
2021 **Artificial Intelligence**, SAMSUNG Innovation Campus — *Karachi, Pakistan*
2020 **Machine Learning with Python**, Mohammad Ali Jinnah University — *Karachi, Pakistan*

Extra-Curricular

Mohammad Ali Jinnah University - GDSC Chapter — *Karachi, Pakistan*
Google Developers Student Club - Founder & Lead — *2022 - 2023*

IEEE & IEEE Young Professionals - Mohammad Ali Jinnah University IEEE Chapter — *Karachi, Pakistan*
Active Member & Organizer — *2021 - 2023*

Robotic & Engineering Society - Mohammad Ali Jinnah University FOE Dept. — *Karachi, Pakistan*
Volunteer & Organizer — *2020 - 2023*

Languages

Persian: Native
Proficient

English: C1
Proficient (IELTS 7.0)

French: A2
Elementary

References

Prof. Guy Gogniat
Professor, Université Bretagne Sud
guy.gogniat@univ-ubs.fr

Prof. Philippe Tanguy
Professor, Université Bretagne Sud
philippe.tanguy@univ-ubs.fr

Dr. Syed Muhammad Ghazanfar Monir
Professor, Karachi School of Business and Leadership
monir@lambdatheta.com