Rayfa Chaabane

Electrical Engineer

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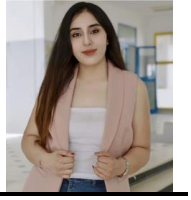

Summary

Electrical Engineer with a background in Industrial Automation and Industrial Computing. My accomplishments include automation, programming, electrical and mechanical design, and implementing advanced solutions in electronics and robotics. My problem-solving skills set me apart.

Experiences

Master Thesis
Roche Diagnostics GmbH, Mannheim, 06/2025-present

- **Development of an Automated System for Flashing and Testing Printed Circuit Boards**
  - Designed and implemented a fully automated system capable of **flashing and testing up to 10 PCBs at once.**
  - Programmed and integrated a **Doosan A0509s robotic arm** for precise handling and positioning Using DART.
  - Designed a **custom test stand** using **KiCad** (electronics) and **SolidWorks** (mechanical design).
  - Created a **desktop application** integrating **STM32CubeProgrammere** and a **dashboard interface** for system monitoring using **Java Script.**

Intern
Roche Diagnostics GmbH, Mannheim, 12/2024-06/2025

- Designed and prototyped various PCBs, including innovative adapters for removable biosensors, enabling flexible usage of different biosensor types, Flexible PCB, and DC DummyCell PCB for sensor validation.
- Utilized SolidWorks to design and prototype detailed 3D models of the Biosensor System.
- Gained practical expertise in the assembly and functionality testing of Biosensors and biosensing technologies.

Intern
RCI3D, Tunisia, 07/2023-09/2023

Designed and executed a filament rewinding system for 3D printing filament extruders by utilizing SOLIDWORKS.

- Fabricated a functional model of the rewinding system employing 3D printing techniques.
- Increased system reliability by successfully integrating Arduino programming.

Intern
RCI3D, Tunisia, 07/2022–08/2022

Designed and developed a test bench to assess the functionality of distance sensors by utilizing SOLIDWORKS. Spearheaded the development and execution of a specialized test bench for sensor performance evaluation.

- Improved testing efficiency by delivering the test bench project ahead of schedule.
- Crafted a 3D-printed model of a test bench, demonstrating precision and quality in design.
- Received commendation for exceptional teamwork and problem-solving skills.

Intern
STERAS, Tunisia, 02/2021–06/2021

Automated an air treatment plant using PXC4.E16 controller and Siemens ABT sites software focusing on regulation of air temperature and pressure.

- Constructed a scale model of the air treatment unit, whilst demonstrating design and functionality
- Designed a user-friendly mobile interface and enhanced remote monitoring capabilities.
- Demonstrated innovative problem-solving, receiving positive stakeholder feedback.

Intern
IEPI D'OR, Tunisia, 01/2020–02/2020

Programmed and controlled temperature regulation for dough extrusion devices using S7-300 controller and STEP7 software. Conduct extensive testing and calibration for optimal temperature control.

- Developed intuitive HMI displays, improving user experience and operational efficiency.
- Recognized for innovative solutions in temperature control, contributing to process improvements.

Key Academic Projects

Automated Warehouse
- Enhanced warehouse efficiency through automation using Siemens S7-1500 PLC with TIA portal software for PLC programming and Factory IO, including database management, automatic/manual modes, and security features.
- Streamlined operations with custom HMI programming and improved system control.

Four Axis ROBOT Arm
- Developed a proficient pick and place robot arm with four joints, utilizing SOLIDWORKS for mechanical design.
- Programmed the arm using Arduino IDE aimed at enabling precise movements and tasks of execution.
- Implemented a MATLAB interface and wireless control to enhance the robot arm's functionality.

ERP Implementation Project Manager
- Led the SAP-based ERP implementation to streamline Material Management, Product Planning, and Enterprise Asset Management.

Automated Water Storage Model
- Achieved optimal level control in a water tank using a Siemens S7-1200 PLC and TIA Portal, including database and digital/analog control modes. Designed HMI TP700 to enhance system monitoring and control capabilities.

Credit Card Clients
- Enhanced a credit card using Machine learning algorithms and Anaconda software, Completed the following steps: Data preparation, Feature selection, testing decision tree and random forest algorithms, Calculated AUC for the algorithms and chose the best algorithm.

Education

- **Exchange Program in Data Science at** , Philipps-Universität Marburg, Germany, 2025 - Present
- **Exchange Program in Electrical Engineering at** Fachhochschule Schmalkalden, Germany, 2023 - 2024
- **Master's Degree in Mechatronics Engineering at** Esprit: Private higher school of Engineering and Technology, Ariana, Tunisia, 2021 – Present
    - All coursework completed, thesis pending
- **Bachelor's Degree in Electrical Engineering |** ISET: Higher Institute of Technological Studies, Sousse, Tunisia, 2018 - 2021
- **Baccalaureate Degree in Mathematics |** High school Sahafa, Ariana, Tunisia, 2018

Technical Skills

PLC - TIA Portal | Isis Proteus | LabVIEW | MATLAB-Simulink | Siemens NX | SolidWorks | SolidCAM | Catia | C | C++ | Global SAP system | SCADA Automation | Python | HMI | Microsoft Office | KiCAD | Altium CAD | Adobe | JavaScript | DART | FreeCAD

Areas of Expertise

HMI & PLC Programming
MATLAB & Wireless Control Systems
Robotics & Mechatronics Engineering
PCB Design and Soldering
Mechanical Design
Rapid Prototyping
Industry 4.0
Heat Transfer & G&DT
ERP Implementation
Project Management
Computer Vision
Machine Learning & IOT

Certifications

- Certified SOLIDWORKS Associate
- Certification of Application of AI for Predictive Maintenance

Languages

Arabic, Native | French, Fluent | English, Fluent | German, Beginner