BOUTAAROURT HAFID

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Electromechanical State Engineer, passionate about mechanical, electrical, and thermal/energy system design and analysis. Skilled in developing innovative and reliable engineering solutions, with a strong foundation in modeling, simulation, and industrial processes. Rigorous, analytical, and results-driven.

Experience:

ACE Consulting Maroc / Client: Toyota Motor Europe, Casablanca Feb 2025 – Present
Mechanical Design Engineer
Main Responsibilities:

- 3D design and modeling of automotive components using **CATIA V5**.
- Static and dynamic Finite Element Analysis (FEA) for mechanical integrity.
- Thermal and vibrational analysis: heat transfer, vibrations, resonance, fatigue.
- Collaboration with R&D, design, simulation, quality, and production teams.

FEV North Africa, Casablanca Feb 2024 – Jun 2024
Final Year Project (PFE) – R&D Automotive
Project: Mathematical Modeling and Simulation of Selective Catalytic Reduction (SCR) System for Diesel Engines
Main Responsibilities:

- Development of a mathematical model and Simulink simulation of the SCR system.
- Analysis of catalyst performance under varying conditions.
- Optimization of NOx reduction while minimizing fuel consumption.
- Collaboration with R&D team for validation and refinement.

Yazaki Morocco, Meknes Jun 2023 – Jul 2023
Final Year Internship (PFA)
Project: Spare Parts Management Tool using Excel/VBA and Power BI Dashboard
Key Contributions:

- Analyzed production process of electrical harnesses to identify bottlenecks.
- Updated work instructions and maintenance plans to improve reliability.
- Developed Excel/VBA tool to centralize spare parts data and track usage.
- Created Power BI dashboard to visualize KPIs, stock levels, and usage trends.

BaukoSolar, Meknes Jun 2022 – Jul 2022
Technical Initiation Internship – PV System Design for Water Pumping
Key Contributions:

- Assisted in PV system design and dimensioning for water pumping.
- Calculated energy requirements, panel sizing, and battery storage.
- Analyzed solar irradiation data and optimized system performance.
- Participated in installation and commissioning on-site.

Education:

ENSAM Meknes, Morocco 2018 – 2024
Electromechanical State Engineer

High School TICHOUKT – Boulemane 2015 – 2018
Baccalaureate – Science, Mathematics A

Technical Skills:

- **Mechanical Engineering:** Design and sizing of components, mechanics of materials, fatigue, kinematics and dynamics, vibrations, manufacturing processes.
- **Electrical Engineering:** Electrical machines, power electronics, circuit protection, basic control systems (PID, feedback).
- **Thermal & Energy Systems:** Heat transfer, thermodynamic cycles, fluid mechanics, turbomachines, hydraulics/pneumatics, energy conversion, thermal management.
- **Project Management:** PERT, GANTT, MS Project.
- **CAD/CAE:** CATIA V5, Abaqus, Ansys, AutoCAD, SolidWorks, MATLAB/Simulink.
- **Programming:** VBA.
- **Office Tools:** Microsoft Office Suite.

Soft Skills:

- Rigour and Team Spirit
- Fast Learning Ability
- Good Interpersonal Communication
- Problem Solving
- Adaptability
- Critical Thinking
- Attention to Detail

Languages:

- Arabic (Native)
- French (Fluent)
- English (Fluent)

Academic Projects:

Mechanical Transmission System Design 2022
ENSAM-Meknes

- Sizing of a mechanical transmission system.
- Modeling of forces (torsors), selection of coupling to electric motor, calculation of transmitted torque.
- Sizing of gears, shafts (torsion/bending), and keys according to standards.
- Bearing selection and lifetime estimation.
- Material selection and verification of strength and stiffness.
- Creation of the assembly drawing in A0 format.

Courses / Trainings:

FEM & Simulation: ANSYS, Abaqus – Structural and Mechanical Analysis

CAD Design: CATIA V5 – Mechanical Component Design and Modeling

Programming: VBA – Automation and Tool Development

Professional Training: Toyota Motor Europe – Engineering Practices and Automotive Standards