

Houssem SAADAoui

Mechanical Engineer — Design, Structural Analysis & Optimisation, Mechatronics

Email: houssem.saadaoui01@gmail.com | Phone: +33 7 69 60 85 58

LinkedIn: linkedin.com/in/houssem-saadaoui | Portfolio: houssemsaadaoui.com

Address: 86 Av. Général Leclerc, 72000 Le Mans, France | Date of birth: 11/05/1999 | Full driving licence (cat. B)

Available immediately | Open to relocation across France | Seeking a permanent position (CDI)



PROFESSIONAL PROFILE

Dual-degree engineer in **Mechatronics** (ESPRIT) and in **Mechanical Modelling, Simulation and Optimisation — MCOP** (ISMANS CESI), **Certified SolidWorks Expert (CSWE)**, with **16 months of industrial experience** (final-year engineering project + 3 engineering internships) across cleantech, food processing, cement and electronics. Twofold mechanical and mechatronic expertise: **mechanical design** and **3D CAD, standardised dimensioning and tolerancing** (ISO 2768, ISO 1101, ISO 1302), **sizing** and **finite element analysis, structural and topology optimisation** on one side; **automation, closed-loop control, instrumentation, sensors** and **mechanical / electronic integration** on the other. Used to working with **structured technical data** (bills of materials, revision levels, definition drawing packages) in a **PDM / PLM** environment. Design of **multi-technology systems** following the **V-model**, from concept design through **prototyping** to **industrialisation**. French and English at C1 level.

TECHNICAL SKILLS, SOFTWARE AND TOOLS

Mechanical design & CAD: SolidWorks (CSWE), CATIA V5, NX Siemens, NX Unigraphics, CREO — 3D/2D modelling, assemblies, detail drawings, definition drawing packages, DFM/DFA, design reviews, functional analysis and specification writing.

Dimensioning, tolerancing & standards: functional dimensioning, geometric tolerancing, GD&T / ISO GPS — ISO 2768 (general dimensional and geometrical tolerances), ISO 1101 (geometrical product specification), ISO 1302 (surface finish indication), ISO 286 (fits), tolerance stack-ups, reading and producing definition drawings.

PDM / PLM & technical data management: PTC Windchill, GEMS, SolidWorks PDM (*basics*) — configuration management, bills of materials (BOM), product structures, revision levels, approval workflows, document life cycle, change traceability (ECR/ECO).

Simulation & numerical analysis: Abaqus, ANSYS, HyperMesh, Altair OptiStruct — finite element analysis (FEA), meshing, static, dynamic and vibration analysis, modal analysis and natural frequencies, buckling, Von Mises criterion, safety factor, structural and topology optimisation, weight reduction, calculation reports and test-simulation correlation.

Mechatronics & automation: Siemens TIA Portal, TwinCAT, Altium, KiCad, Proteus, XRelais — industrial automation, PID control, instrumentation, sensors, SCADA, electronics, mechanical / electronic integration.

Programming & data: MATLAB, Simulink, LabVIEW, Python, C++, Arduino — numerical modelling, data processing, calculation automation, embedded systems.

Robotics & vision: ABB RobotStudio, Gazebo, OpenCV — mobile robotics, closed-loop control, machine vision, kinematic modelling (forward/inverse kinematics).

Manufacturing & prototyping: Mastercam (3D Mill & Lathe) — CNC machining, machining tolerances, 3D printing, prototyping, test benches, testing and validation, industrialisation, process and material selection.

Methods & quality: MS Project, DELMIA — project planning and tracking, V-model, requirements management, design reviews, FMEA, 5 Whys / Ishikawa, ISO 9001:2015, continuous improvement, writing of technical dossiers and documentation.

Transferable skills: cross-functional teamwork, technical communication, supplier relations, autonomy, rigour, analytical and synthesis mindset, proactivity, adaptability in international environments.

PROFESSIONAL EXPERIENCE

Mechanical Engineer — Final-Year Engineering Project

Sept. 2025 – Feb. 2026

Arkeale, Strasbourg — cleantech

- **Designed and optimised** in SolidWorks the **3D/2D mechanical architecture** of a bio-waste recovery capsule (40 parts, 5 sub-assemblies), from **concept design** through to the **definition drawing package**.
- **Produced 25 definition drawings** dimensioned and toleranced to **ISO 2768** (general tolerances), **ISO 1101** (geometric tolerancing) and **ISO 1302** (surface finish); **tolerance stack-ups** and **fits** to guarantee assemblability.
- **Structured and maintained the product technical data:** **bills of materials (BOM)**, **assembly structure**, **revision levels** and **change traceability**, ready for integration into a **PDM / PLM** environment.
- **Sized by finite element analysis** the **static** and **vibration** behaviour of complex structures; **structural optimisation** achieving **-18% mass** at equivalent **stiffness**.
- **Wrote 3 technical dossiers** and led the **prototyping, testing** and **validation** phases with **4 suppliers**, cutting prototyping lead time by **20%**.

Technical environment: SolidWorks, ISO 2768 / 1101 / 1302, tolerance stack-ups, finite element analysis, structural and topology optimisation, DFM/DFA, bills of materials and revision levels (PDM/PLM), prototyping, technical dossiers

Engineering Intern — Automation

June 2024 – Sept. 2024

Natilaït, Bizerte — food processing industry

- **Analysed and modelled** production parameters (temperature, pressure) on **2 production lines** to improve the reliability and efficiency of the installations.
- **Designed and simulated** in MATLAB / Simulink a mechanical system and its **PID control loop**, targeting a reduction in energy losses (**-12%** target).
- **Integrated 15 sensors** and the **SCADA** supervision interfaces, in coordination with the production and maintenance teams; centralised process data and the related documentation.

Technical environment: modelling and simulation, PID control, instrumentation and sensors, SCADA supervision, process data management and analysis, energy optimisation

Engineering Intern — Mechanical and Mechatronics Engineering

June 2023 – Sept. 2023

Bizerte Cement Plant — heavy industry

- **Justified by finite element analysis** (Abaqus) the structural strength of **4 heavy equipment units** (mills, kilns) and produced the **dimensioning and detail drawings** in CATIA V5 in accordance with **ISO 2768** and **ISO 1101**, specifying surface finishes (**ISO 1302**) on bearing surfaces and fits.
- **Carried out the technical feasibility study** of a **vibration monitoring** system (vibration and spectral analysis), including costing and installation recommendations.
- **Diagnosed 6 recurring failures** and proposed a **reliability** and **preventive maintenance** plan targeting **-15% unplanned downtime**; updated the equipment technical documentation base (drawings, part references, intervention histories).

Technical environment: CATIA V5, Abaqus, ISO 2768 / 1101 / 1302, structural analysis, vibration analysis, reliability, preventive maintenance, technical documentation base

Engineering Intern — Design and Automation

May 2022 – Aug. 2022

FUBA, Bizerte — industrial electronics

- **Modelled and simulated in 3D CAD** 8 electronic boards and their mechanical supports (**mechanical / electronic integration**), with standardised dimensioning of the mechanical interfaces.
- **Developed and qualified an automated test bench**, from feasibility study to functional validation, cutting test time by **30%**.
- **Wrote the technical documentation**, managed component references and **bills of materials**, and coordinated exchanges with **5 suppliers**.

Technical environment: 3D CAD, mechanical / electronic integration, automated test bench, functional validation, bills of materials

EDUCATION

Master of Engineering (Diplôme d'Ingénieur) — Mechanical Modelling, Simulation and Optimisation (MCOP) ISMANS CESI, Le Mans	2023 – 2026
Master of Engineering (Diplôme d'Ingénieur) — Mechatronics ESPRIT, Tunis	2019 – 2023
BSc Physics and Chemistry (first year) Faculty of Sciences of Bizerte	2018 – 2019

ACADEMIC AND PERSONAL PROJECTS

Full details of each project: houssemsaadaoui.com/projects — clickable titles.

- Reconfigurable parallel robot with bistable gripper** — Mechanical design and kinematic modelling (forward/inverse kinematics) of the mechanism; sizing of the bistable gripper and workspace study.
- "AXIDRAW" CNC machine** — Complete 3D CAD design and high-precision guidance kinematics (± 0.01 mm): guideways, transmission, tolerance stack-ups and ISO 2768 / 1101 tolerances.
- Vibration measurement bench** — Modelling and assembly of a test bench for the dynamic and modal analysis of a motor: instrumentation, data acquisition and analysis.
- Aerodynamic optimisation of a UAV** — Simulation and optimisation of aerodynamic and structural performance.
- "Smart Summer Summit v2" rescue drone** — Aerodynamic feasibility study, structural design and simulation.
- Warehouse robot** — Mobile transport robot: mechanical structure optimised for stiffness and mass (-20%).
- "Vergie" energy-generating bicycle** — CAD modelling, material selection and optimisation of transmission efficiency.
- Stroboscopic fountain** — Sizing of a mechanically synchronised system coupled with electronic control.
- Maintenance and diagnostics of a centre lathe** — Analysis of mechanical parts, wear study and maintenance dossier.
- ISO 9001:2015 audit checklist** — Continuous improvement of industrial quality, reliability and compliance.

CERTIFICATIONS

CSWE — Certified SolidWorks Expert (SolidWorks ATC) | 3D Mill & Lathe Certificate (Mastercam) | Engineering Project Management: Initiating and Planning (Coursera) | Storytelling and Influencing (Coursera)

LANGUAGES

Arabic: native | French: C1 | English: C1 | German: B1 | Spanish: A2