

Louis LABESSE

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I am a 4th-year engineering student at Arts et Metiers Institute of Technology (Paris, France), passionate about mechanical engineering and its diverse applications in robotics and biomechanics.

Education - Overall GPA: 3.9/4

ENSAM – Arts et Métiers Engineering School - GPA: 3.59/4 - Metz/Paris, France: Sept 2024 – July 2026

• Combined BSc + MSc in Mechanical and Industrial Engineering

Relevant coursework: Applied Mechanics, CAD, Heat Transfer, Fluid Dynamics, Mathematics, Industrial Engineering, Machining, Metal Bending, Punching, Forging, Electrical Engineering, Materials Sciences, Computer Science, Biomechanics

Lycée Voltaire - Preparatory Class - GPA: 4/4 - Paris, France: Sept 2021 – July 2024

• A three-year intensive program for admission to top-ranked engineering schools.

Relevant coursework : Mathematics (Advanced calculus, Algebra, Probability), Physics (Mechanics, Electromagnetism, Thermodynamics), Engineering Sciences (Structural analysis, Materials science, Industrial mechanics), Computer Science, Technical Drawing, and CAD Design.

Lycée International - Saint-Germain-en-Laye, France: Sept 2018 – July 2021

• French Scientific High school Diploma – International Option (OIB) - Bilingual Curriculum in Spanish.

Selection of Relevant Projects

Glenoid Implant CAD Design, FEA, Prototyping- IBHGC Arts et Métiers Institute of Technology October 2025 - Ongoing

Supervised by Dr. Nathalie Maurel and Dr. Amadou Diop - Paris, France

Objectives: Design, validate, and prototype a glenoid implant using CAD, finite-element analysis, and advanced polymer manufacturing.

- Designed a full CAD model of a glenoid implant and performed finite-element analysis using Abaqus on CATIA-generated geometry. Implemented elastic-plastic UHMWPE material properties ($E = 2100 \text{ MPa}$, $\nu = 0.37$) and applied 50–300 N quasi-static loading conditions to replicate physiological joint forces.
- Used additive manufacturing and ionizing-radiation to produce UHMWPE prototypes to improve wear resistance and reduce debris.
- Designed and executed a mechanical-testing protocol, instrumented the implant with strain gauges, and measured deformation using a camera-based tracking under controlled loading.

Shoulder Kinematics and Motion Analysis - IBHGC Arts et Métiers Institute of Technology Sept 2025 - October 2025

Supervised by Dr. Nathalie Maurel - Paris, France

Objectives: Build a biomechanical understanding of glenohumeral motion through sensor-based kinematic analysis.

- Conducted a full literature review to map existing glenoid prosthesis designs and establish a technical state of the art.
- Designed and implemented a custom experimental protocol using electromagnetic tracking sensors (60 Hz)
- Performed 5 pointing trials on 6 subjects to quantify humerus–scapula rotational dynamics.
- Identified orientation error of 2.3° , evaluated limitations of EM tracking, proposing improvements using an optoelectronic motion-capture system.

AI Project - Text and Image-Based CAD generation using Python, Paris, France September 2025 - Ongoing

Objectives: Develop a pipeline capable of extracting key information from sketches to classify design ideas for additive manufacturing.

- Formalized the four AM criteria into verifiable rules and annotated idea sheets to build reference datasets.
- Developed a Python pipeline combining NLP preprocessing and basic vision filters for text–image feature extraction.
- Implemented a rule- and embedding-based classifier mapping extracted features to the four AM criteria.

Automated Warehouse Simulation February 2025 - June 2025

Supervised by Dr. Alain Etienne - Metz, France

Objectives: Simulate a dynamic automated warehouse system using Python

- Optimized an automated warehouse environment using object oriented programming (robots, conveyors, storage zones...)
- Developed an adaptive A* algorithm to enable real-time pathfinding and collision avoidance in a constantly changing setting.
- Used Tkinter to create a graphical user interface for visualization and XML for data configuration and storage.

Research Project, Study of Playgrounds Producing Energy Sept 2023 - June 2024

Supervised by Dr. Willie Robert and Nicolas Boucher - Paris, France

Objectives: Conduct a mechanical study by designing, modeling, and testing a full-scale playground system capable of generating electricity.

- Designed and built a life-size slide prototype (3m slope) to simulate electricity production.
- Used 3D modeling software to design and 3D print 24 prototype components.
- Implemented a 12V-DC motor as a generator and conducted 25+ tests involving computer science, electronics, and energy science.

Research Project at Seine Aval Wastewater Treatment Plant Sept 2021 - June 2023

Supervised by Dr. Willie Robert and Nicolas Boucher - Paris, France

Objectives: Analyze and dimension automatic bar screens at one of Europe's largest wastewater treatment plants

- Designed and analyzed automatic bar screens, including size (1 m wide, 2 m high) and hydraulic / electrical parameters (1.4 m³ / s per bar screens powered by DC motors).

- Worked in partnership with engineers at one of Europe’s largest wastewater treatment plant, for technical insights.

Work Experience

Alveus – Group Tutoring (STEM subjects), Micro-Entrepreneur, Paris, France August 2025 - Ongoing

Objectives: Organize a full scientific course for 4 students, giving detailed feedback to other teachers and parents

- Taught groups of 4 students (ages 12–18) in simultaneous sessions ranging from 2 hours to full days.
- Adapted pace, exercises, and methods to different levels, switching flexibly between subjects every 10 minutes.
- Maintained rigorous scientific accuracy while keeping classes dynamic and engaging.

Internship at Beynat et Janniaux Maroquiniers, Paris, France June 2025 - July 2025

Objectives: Contributed to engineering tasks in a factory environment while studying the mechanical behavior of industrial machines.

- Analyzed the mechanical behavior and operating limits of cutting and pressing machines used in leather manufacturing to
- Completed finishing work on 50 limited-edition bags for a leading fashion house and assembled over 1,000 leather components
- Supported factory operations through stock management and installing 80m of safety markings.

Contract with the supermarket chain "Super U", Le Mesnil Le Roi, Yvelines, France Summer 2024

Objectives: Keep the store well-arranged, organize stocks and optimize sales through summer promotions.

- Managed inventory with product pallets weighing up to 2 tons.
- Organized 3 shelves per day, maintained stock levels and managed expired products and promotions.
- Inventory was efficiently managed, ensuring product availability during understaffed periods.

Seasonal Job at Hotel Vernet (5-Star), Champs-Élysées, Paris, France Summer 2023

Objectives: Guarantee high quality service in 4 languages in a very demanding environnement

- Worked as a waiter, room attendant, and barman in a luxury hospitality setting.
- Managed 110+ guests per shift in the dining area and serviced 50+ rooms daily.

Leadership, Volunteering and Student Engagement

Volunteer – European Solidarity Corps, Târgoviște, Romania August 2025

- Contributed to the construction of a site welcoming children from disadvantaged backgrounds.
- Led and supervised activities, creating meaningful connections and supporting children’s development.
- Coordinated with an international volunteer team, communicating in English, German, Spanish, French, and Romanian.

Member of ENSAM electronics club, Metz, France Sept 2024 - June 2025

- Managed inventory and funds for 3D printers.
- Repaired and maintained overused or broken electronic devices at the school
- Repaired two computers, soldered 4 lighting systems for the school, printed 20+ pieces for personal student’s use, repaired a DJ mixing table

Member of ENSAM open access blacksmithing club, Metz, France Sept 2024 - June 2025

- Handcrafted protection parts for a robotic arm.
- attended more than 15 sessions, introducing newcomers to blacksmithing techniques.
- Supervised safety measures and ensured all participants wore appropriate protective gear.

Volunteer at Les Amis de Remagen, Maisons Laffitte, France Sept 2018 - Ongoing

- Assisted in 40+ German language lessons with 7–14 participants per session.
- Participated in 5 cultural exchange events, fostering Franco-German relations.

Summer Camp Young Panda WWF, Baden-Württemberg, Germany Summer 2017
Took part in environmental actions such as forest clean-ups and biodiversity workshops with other international volunteers.

Skills

- **Languages:** French - Native, Spanish - Bilingual: DELE + IOB, English - Advanced: TOEFL 100/120, German - Upper Intermediate: SchprachDiplom, Romanian - Beginner
- **Programming Languages:** Python, MySQL, LaTeX, Arduino, Html, CSS
- **Engineeering Software:** Matlab, Yakindu, ABAQUS, StarCCM+, CATIA-V5, Solidworks, Fusion360, Regressi

Interests

- **Sports:** Rugby: Member of Frogsbeef ML Club, Running: Trained 200m Track Athlete, Climbing, Badminton
- **3D software:** 3D modeling, simulations and 3D printing
- **Hardware** PC maintenance, Electronics repair and component troubleshooting
- **Meditation**