

Louis LABESSE

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6th-year MEng Mechanical Engineering student at UC Berkeley, focused on mechanical product design, manufacturing, prototyping and experimental testing. Targeting Mechanical Engineering opportunities.

Education - Overall GPA: 3.9/4

UCB - University of California Berkeley - Berkeley, United States:

Sept 2026 – May 2027

• M.Eng in Mechanical Engineering and Affinity Group Leader of Product Design

Relevant coursework: Robotics course under Prof. Roberto Horowitz, Experiential Advanced Control Design under Prof. Francesco Borelli, Modeling, simulation, and digital-twins of drone-based systems under Prof. Tarek Zohdi, Adv Designing for the Human Body.

ENSAM - Arts et Métiers ParisTech - GPA: 3.9/4 - Metz/Paris, France:

Sept 2024 – July 2026

• Combined BSc + MSc with Lycée Voltaire in Mechanical and Industrial Engineering

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

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

Work Experience

Mechanical Product Design Engineer – Autodesk Sponsored Capstone Project - Berkeley, CA, US

August 2026 - Ongoing

Objectives: Develop and evaluate regenerative braking technologies to extend electric bicycle range.

- Developing an energy recovery system integrating mechanical design, electric motor braking, and energy storage.
- Modeling regenerative braking performance across vehicle speed, mass, terrain, and system efficiency.
- Applying Autodesk Fusion for mechanical design, simulation, and prototype development in a 3-person engineering team.

Product Development Engineer : Nobsolete startup - Paris, France

January 2026 - June 2026

Objectives: Design Electro-Mechanical system detecting degradation through vibration analysis, machine learning, and embedded sensing.

- Acquired 6-axis IMU datasets from functional and fouled electric shavers under controlled experimental conditions.
- Applied FFT spectral analysis to identify frequency shifts, emerging peaks, noise growth, and anomalies.
- Implemented K-Means clustering, TDA, and decision-tree classification for automated condition monitoring and diagnosis.
- Achieved 90percent detection accuracy using vibration-based features, feature engineering, and confusion-matrix validation.

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

August 2025 - June 2026

Objectives: Organize a full scientific course for 4-6 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.

Completure – Bilingual Private Tutoring (STEM Subjects), Part-Time Employment, Paris, France

Sept 2024 - July 2026

Objectives: Adapt english explanations of French STEM Subjects to international highschoolers.

- Delivered weekly one-to-one tutoring sessions (1.5–2 hours each) to five high-school students (aged between 14 and 18).
- Adapted explanations to different learning styles, fostering better understanding and engagement.
- Organized an already charged academic planning to include 10h per week of tutoring.

Mechanical Engineer Intern at Beynat et Janniaux Maroquiniers, Paris, France

June 2025 - August 2025

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

- Analyzed the mechanical behavior and operating limits of cutting and pressing machines used in leather manufacturing
- 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 handling delivery 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.

Selection of Relevant Projects

Mechanical and Product Design Project: Disc Brake System

January 2026 - June 2026

Supervised by Dr. Pascal Caestecker - Paris, France

Objective: Design and dimension a complete disc-braking system from vehicle requirements and mechanical constraints.

- Designed a complete disc brake system, translating target vehicle deceleration into mechanical design requirements.
- Calculated braking forces and a required 204 N·m braking torque per wheel to dimension the system.
- Designed and validated the brake geometry using CATIA, considering mechanical loads, packaging, and component integration.

STEM Outreach and Science Education Program for Elementary School Students

March 2026 - June 2026

Supervised by Dr. Benedicte Hayne and Dr. Marc Rebillat - Paris, France

Objectives: Design engaging scientific workshops translating complex physics concepts into accessible hands-on learning experiences.

- Designed and delivered 3 hands-on STEM workshops covering energy, mechanics, and electronics for 27 elementary students.
- Developed interactive experiments and demonstrations translating complex scientific concepts into learning experiences.
- Led workshop facilitation, logistics, and educational content development, fostering curiosity and participation.

Glenoid Implant Design and Biomechanical Validation- IBHGC Arts et Métiers Institute of Technology

October 2025 - January 2026

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

Objectives: Investigate shoulder biomechanics to design, simulate, prototype, manufacture, and validate glenoid implants.

- Designed CAD implant and performed nonlinear Abaqus FEA using elastic-plastic UHMWPE properties ($E=2100\text{MPa}$, $\nu=0.37$).
- Simulated physiological loading through 50–300 N quasi-static load cases, replicating physiological joint mechanics.
- Manufactured and tested UHMWPE prototypes using additive manufacturing, ionizing-radiation treatment, strain gauges, and camera-based tracking to correlate experimental deformation with simulation results.

Shoulder Kinematics and Motion Analysis-Paris, France

Sept 2025 - October 2025

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

Objectives: Experimentally investigate shoulder biomechanics and quantify humerus-scapula rotational dynamics.

- Designed and implemented a custom experimental protocol using electromagnetic tracking sensors operating at 60 Hz.
- Performed 5 pointing trials on 6 subjects to quantify humerus-scapula rotational dynamics.
- Identified an orientation error of 2.3 degree, evaluated limitations of electromagnetic tracking, and proposed improvements using an optoelectronic motion-capture system.

Mechanical Product Design Project : Camshaft Mechanism- Paris, France

Sept 2025 - December 2025

Supervised by Dr. Pascal Caestecker

Objective: Redesign and validate an industrial mechanism to increase operating speed while maintaining mechanical reliability.

- Redesigned a cam-driven mechanism in CATIA to increase production capacity from 800 to 1,800 bottles/hour.
- Evaluated contact pressure, buckling, component interference, and mechanical loads to validate the design.
- Iterated geometry based on analytical calculations and mechanical constraints.

Automated Warehouse Simulation- Metz, France Supervised by Dr. Alain Etienne

February 2025 - June 2025

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.

Management and Optimization of Tool Inventory on a Production Line-Metz, France

Sept 2024 - June 2025

Objectives: Optimize tool organization and accessibility on a manufacturing production line using industrial engineering and CAD.

- Managed an inventory of approximately 45 tools used across a 42 m^2 production line.
- Optimized storage layout based on frequency of use and tool location on the production line to improve retrieval efficiency.
- Created 3D models of all 45 tools using scanning, Manufactured 9 custom foam inserts with the imprints of the 3D-modeled tools.

Personal Project - Creation of a Portfolio Website

January 2025 - Ongoing

Objectives: Independently design, develop, deploy, and maintain a personal engineering portfolio website.

- Independently learned HTML and CSS through online resources and engineering-school coursework.
- Debugged HTML/CSS integration issues learning domain management, web hosting, and HTTPS deployment.

Research Project, Energy-producing playground equipment

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 automatic bar screens of ($2m^2$), hydraulic/electrical parameters ($1.4m^3/s$ per bar screens powered by 12V DC motors).
- Worked in partnership with engineers at one of Europe's largest wastewater treatment plant, for technical insights.

Leadership, Volunteering and Student Engagement

Volunteer – La Compagnie du 20ème, Electronics Repair, Paris, France

July 2025 - Ongoing

- Assisted a volunteer team in diagnosing and repairing damaged PCs, laptops, and tablets.
- Disassembled, tested, and troubleshooted electronic components, successfully repairing multiple devices.
- Trained and supported new volunteers joining the electronics repair workshops.

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 and repaired + 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 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 compliance with 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 in German language, 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: SprachDiplom, Romanian - Beginner
- **Technical and Programming Languages:** Python, MySQL, LaTeX, Arduino, Html, CSS, ROS, BondGraphs
- **Engineering Software:** Matlab, Yakinu, ABAQUS, StarCCM+, CATIA-V5, Solidworks, Fusion360, 3DExperience, 20-Sim

Interests

- **Sports:** Judo : 14 years of practice + regional competitions | Rugby: Member of Frogsbeef ML Club | Mountain Biking
- **3D software:** 3D modeling, simulations and 3D printing
- **Hardware** PC maintenance, Electronics repair and component troubleshooting
- **Meditation**