# BURAK KARAGÖZ



**MSc. Mechanical Engineering | École Polytechnique Fédérale de Lausanne**
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## PROFILE

Mechanical Engineering MSc student at EPFL, specializing in Design and Production, with hands-on experience in robotic mechanisms, sensor development and prototype testing. Through projects in vision-guided harvesting, automated sorting and textile sensing, I have combined CAD, programming and iterative prototyping with experimental validation. Seeking a Master's thesis project in mechanical engineering or robotics starting in September 2027 to contribute to the mechanical design, system integration and performance-driven development.

## EDUCATION

**EPFL – École Polytechnique Fédérale de Lausanne** | MSc. Mechanical Engineering Sept 2025 – Present · Lausanne, Switzerland

- Specialization in **Design and Production**; minor in Management, Technology and Entrepreneurship.
- Key courses: Applied Mechanical Design, Product Development and Engineering Design, Manufacturing Processes.

**EPFL – École Polytechnique Fédérale de Lausanne** | BSc. Mechanical Engineering Sept 2021 – Aug 2025 · Lausanne, Switzerland

- Grade average: 5.1/6.0.

**Lycée Saint Joseph d'Istanbul** | French Baccalaureate equivalent 2016 – 2021 · Istanbul, Turkey

## ACADEMIC PROJECTS

**Multimodal Textile Sensor Glove** | Semester project Sept 2026 – Present · Lausanne, Switzerland

Supervised by Prof. Josie Hughes - EPFL Computational Robot Design & Fabrication Lab

- Fabricated **resistive strain and capacitive pressure textile sensors** and characterized their sensitivity and hysteresis, using a robotic-finger test rig to compare resistive output with vision-derived joint angles.
- **Robotic-hand trials ongoing**; Kalman fusion of resistive/capacitive measurements with Virtual Model Control (VMC) kinematic/force predictions **is planned** for pose and contact estimation.

**Automated Screw Sorting System** | ME-420 Adv. Design for Sustainable Future Sept 2025 – Feb 2026 · Lausanne, Switzerland

Supervised by Prof. Jamie Paik - EPFL Reconfigurable Robotics Lab

- Developed an automated sorter with three synchronized mechanisms, integrating extraction, inspection and sorting through an **ESP32 state machine** and **Raspberry Pi computer vision**.
- Achieved **90% sorting accuracy at 12 screws/min** and **57 W maximum power use** by implementing distance-sensor feedback and proportional control for inspection positioning.

**Raspberry Harvesting Gripper** | ME-320 Product Dev. and Engineering Design Sept 2024 – Feb 2025 · Lausanne, Switzerland

Supervised by Prof. Josie Hughes - EPFL Computational Robot Design & Fabrication Lab

- Engineered a harvesting tool with **Python computer vision** for localization and ripeness assessment; validated the mechanical design through **iterative prototyping** against feasibility and manufacturing tolerance constraints.
- Ranked **3rd out of 50 teams** in the final evaluation, detecting 17 raspberries and harvesting **9 ripe fruits without damage** in **under 5 minutes**.

**Finite Element Structural Analysis** | FEM Modelling Project Feb 2025 – June 2025 · Lausanne, Switzerland

- Modelled three geometries in **Abaqus finite element analysis (FEA)** to compare stiffness and displacement under load, defining boundary conditions and accounting for geometric nonlinearities.
- **Optimized meshes through local refinement and convergence studies** to limit node count; post-processed and interpreted structural-analysis results.

## EXTRACURRICULAR EXPERIENCE

**EPFL Watchmakers** | Tourbillon Project Lead - R&D Sept 2024 – Present · Lausanne, Switzerland

Project sponsored by **Hermès Horloger**

- Developed and functionally validated **four distinct flying tourbillons over two years**, from requirements definition through design, mechanical sizing, fabrication and prototype testing.
- Reduced tourbillon size by **25% through iterative design** and sizing, accounting for conventional manufacturing constraints; metal fabrication of the latest version is planned with support from Hermès Horloger.

## SKILLS

- **Technical:** Solidworks, Autodesk Inventor, Fusion 360, CATIA, Abaqus, Python, MATLAB, Simulink, LabVIEW, Office, LaTeX.
- **Languages:** French: Bilingual (DALF C1); English: Bilingual (IELTS 7.5/9, C1); Turkish: Native.
- **Soft skills:** Analytical rigor, project management, technical communication, teamwork, autonomy.
- **Interests:** Triathlon, sailing, tennis, skiing.