

LUCAS BÆKGAARD

Mechanical Engineering Student

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PROFILE

Mechanical engineering student at the Technical University of Denmark, graduating in December 2026. For as long as I can remember I have loved building and tinkering with things, and I enjoy taking part in every stage of a project, from design through manufacturing and assembly to redesign. My work spans CAD and design for manufacture, finite element analysis, hands-on fabrication and, increasingly, robotics and control. I am seeking an internship where I can develop my skills while building, developing and testing real hardware.

EDUCATION

2023 – 2026	BSc in Mechanical Engineering Expected graduation December 2026. <i>BSc project (DTU Electro):</i> guidance and navigation system for the BlueBoat uncrewed surface vehicle. I am building a mathematical model of the boat's manoeuvring and combining it with experimental data to design a guidance and navigation system for autonomous mapping and surveillance missions. <i>Relevant courses:</i> Robotics; Dynamics and Vibrations; Linear Control Design 1; Strength of Materials 1 and 2; Finite Element Analysis; Heat Transfer; Basic Fluid Mechanics.	<i>Technical University of Denmark (DTU)</i>
2018 – 2021	International Baccalaureate Diploma	<i>Nørre Gymnasium, Copenhagen</i>

ENGINEERING PROJECTS

2025 – present	Float Forward Float Forward builds an eco-friendly single-pilot catamaran to race at the Monaco Energy Boat Challenge. I designed, manufactured and integrated many of the mechanical parts of the 2026 boat, which finished 6th of 21 teams from around the world.	<i>Student racing-boat team, DTU</i>
2026	Automated plasma measurement gantry In a team of five, designed and built a two-degree-of-freedom gantry for the linear plasma measurement device at DTU's fusion energy research section, intended to let the department carry out tomographic studies of the plasma. Lead-screw axes driven by stepper motors and controlled from an ESP32.	<i>Group project, DTU</i>
2025	SEEK – uncrewed surface vehicle With a group, built and programmed a surveillance and mapping drone boat in three weeks from low-cost hobby electronics and a 3D-printed catamaran hull. It featured a custom mission-planning app, a PID heading controller and waypoint navigation using GPS and IMU data.	<i>Mechatronics course project, DTU</i>
2025	TurboBrush Battery-powered handheld brush for cleaning climbing holds, with a high-power brushless blower, battery pack with BMS and an ATtiny microcontroller.	<i>Personal project</i>

2023	Injection moulds for polymer production	<i>Group project, DTU</i>
	Programmed and CNC-milled simple injection moulds and used them in a 10-tonne moulding machine. Characterised shrinkage and warping of the moulded parts in a metrology lab using dial indicators, a shadowgraph and a coordinate measuring machine.	
2020	Carbon fibre electric skateboard	<i>Personal project</i>
	Designed, built and tested a 1.5 kW electric skateboard with a top speed of 37 km/h, including the foam-core carbon fibre deck, drivetrain and electronics, mostly from scavenged hardware and RC parts.	
2023 – 2025	Other builds	<i>With friends</i>
	Repaired an industrial meat slicer by 3D-scanning and reprinting a broken nylon helical gear. Designed and printed Voronoi mushroom lampshades with lathe-turned wooden legs, using water-soluble and break-away supports. Designed a corner bench for our dormitory in Fusion 360 and built it with power tools and 3D-printed parts.	

EMPLOYMENT

2022 – 2023	Pâtissier (pastry chef)	<i>Totti's, Sydney, Australia</i>
2021 – 2022	Sushi chef	<i>Sushi Lovers, Copenhagen</i>

SKILLS

CAD & CAM	Fusion 360, SolidWorks, Meshmixer, Mastercam; design for manufacture.
Simulation	COMSOL Multiphysics (stationary and transient structural and heat-transfer FEA), shape optimisation.
Programming	Python, C++, MATLAB, L ^A T _E X.
Robotics	ROS, Docker, Linux, Raspberry Pi, Arduino; electronics prototyping; forward and inverse kinematics, trajectory planning, system modelling, feedback control, GPS/IMU fusion.
Workshop	FFF 3D printing, laser cutting, MIG welding, sheet metal, manual lathe and mill, CNC machining, injection moulding, carbon fibre composites, soldering, woodworking.

LANGUAGES

Danish	Native
English	Fluent

INTERESTS

Classical clarinet, board games, cooking and climbing.

References available on request.