Antoine BERTRAND

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PROFESSIONAL EXPERIENCE

Research Assistant on Hydrogen IC Engines - *Kohler Engines Co.* August 2024 – present
Fort Collins, CO

- Modeled H2 combustion using Converge and CHEMKIN to create a predictive combustion model for a H2 IC engine in GT-Power, achieving validation errors below 2% compared to experimental test data.
- Designed and optimized the piston head to reduce the compression ratio from 22:1 to 10:1, enabling the conversion of a diesel engine to H2 while maintaining 30% efficiency.

Automotive Design Intern - *Fiat Powertrain Technologies* May 2024 – August 2024
Lyon, France

- Designed solutions in Siemens NX to integrate H2 fuel cells into vehicle architecture, ensuring seamless fitment.
- Optimized a complex powertrain using Simcenter AmeSim, ensuring compliance with FTP system specifications and client performance targets.

Preliminary design phase project - *THALES Underwater Systems* September 2023 – January 2024
Brest, France

- Led a 4-month preliminary design study using SysML to develop system specifications and propose 3 innovative solutions aligned with Thales' requirements.
- Designed and simulated the chosen solution using Siemens NX to launch and release unmanned sea drones for Mine Counter Measures & Military Survey (MMCMMS).

Electrical & Mechanical Engineering Intern - *GAZFIO SA* January 2023 – February 2023
Rouen, France

- Completed a 2-week field assignment at a construction site to master MIG welding techniques and perform electrical wiring for gas treatment systems, reducing installation time for each unit by 10% compared to initial estimates.
- Assisted a team of 10 mechanical engineers in preparing methanization facilities for GRDF (natural gas distributor of the French network) delivering one unit per week.

EDUCATION

MSc. in Mechanical Engineering - *Colorado State University* August 2024 – Expected July 2025
Fort Collins, CO GPA: 3.7/4.0

- Relevant Coursework: Composites Product Development, Advanced Mechanical Systems, Computational Fluid Dynamics.
- Design Project: Conducted CFD simulations in ANSYS Fluent to analyze exhaust gas flow dynamics and scavenging phenomena in exhaust manifolds, utilizing SpaceClaim for geometry preparation.

MSc. in Automotive Engineering - *ENSTA (French Grande École)* August 2022 – Expected July 2025
Brest, France GPA: 3.6/4.0

- Relevant Coursework: Power Transmission Systems, Thermodynamics, Non-Linear Finite Elements, Materials, ICE & Hybridization, Vehicle Architecture, Tire & Chassis dynamics *(taught by Michelin & Bosch experts)*.
- Design Project: Designed a complete engine casing from the ground up in CATIA V5, conducted thermal analysis in ABAQUS, and managed drafting, tolerancing, and material selection for manufacturing.

Preparatory Classes for Top Engineering Schools - *P. Corneille High School* September 2020 – June 2022
Rouen, France GPA: 4.0/4.0

- Two-year intensive program in advanced Mathematics, Physics, and Engineering Sciences for competitive entrance exams to top French engineering schools (National Ranking: 1440/5000).
- Design Project: Analyzed tire grip on dry surfaces using the Pacejka formula in collaboration with Michelin. Modeled an ABS in MATLAB/Simulink and conducted data analysis using Python.

SKILLS & INTERESTS

Languages: Fluent in English (TOEFL & TOEIC Certified), Native in French, Intermediate in Spanish
IT Skills:

- **Simulation & Analysis:** ANSYS Fluent & ChemKin, Converge v4 (CFD); ABAQUS, SimulationXpress, eLaminate (FEA); Simcenter AmeSim AVL Boost, GT-SUITE, Simulink (1D Simulation)
- **Programming & Data:** MATLAB, Python, Arduino/C++ (Code); ORACLE, MySQL (Database); LabVIEW, SysML
- **CAD & Design:** SolidWorks, CATIA V5, Siemens NX, ANSYS SpaceClaim, GT-Suite GEM 3D

Academic: Graduate Teaching Assistant for Engineering Experiment (MECH201: Introduction to LabVIEW) & Engineering Design I (MECH231: Introduction to SolidWorks) at Colorado State University
Interests: Attended 24 Hours of Le Mans & 24 Hours of Spa as an event photographer.