Bilal Mohammed Sajjad Siddiqui

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Portfolio - bilalmssiddiqui-github-io.vercel.app/

SUMMARY

Mechanical Engineer with a strong background in fluid dynamics, heat transfer, and thermodynamics. Experienced in STAR-CCM+, ANSYS Fluent, and TAITherm for 3D/1D simulations, validation, and thermal-flow optimization. Skilled in Python automation, data analysis, and CAD integration (CATIA V5, ANSA). Proven ability to deliver accurate, validated results that improve performance and reduce design cycles.

SKILLS

STAR-CCM+ — Siemens NX — ANSYS Fluent — CATIA V5 — Python — MATLAB — ANSA — META — TAITherm

EXPERIENCE

Thermal Analysis Engineer - Battery Systems, *Volvo Cars* ☐   Jun 2024 – Aug 2024 | Göteborg, Sweden
- **Enhanced efficiency by 35%** by reducing pressure drop through iterative cooling plate design changes using ANSYS Discovery and STAR-CCM+.
- Benchmarked battery packs from competitor vehicles across key metrics, including NVH study and thermal management, conducting detailed teardown analyses to identify design strengths and innovation opportunities.
- Accelerated cross-team design iterations **by more than 50 %** by completing advanced **Teamcenter PLM and CATIA V5 training**, streamlining CAD data management and cutting design-change turnaround time in collaborative projects.

ERP Business Analyst, *Schneider Electric* ☐   Oct 2022 – Aug 2023 | Bangalore, India
- Delivered **USD 12,000+ in cost savings** by implementing the Mobile Supply Chain Application, driving alignment and efficiency across cross-functional teams, acting as the single point of contact.
- Established **100% end-to-end product traceability** at the BEF plant in Bangalore by designing and deploying the Pallet Tracking System, enabling real-time product monitoring from the shop floor to the customer.
- **Reduced month-end system downtime by 65%** by developing remediation scripts with the help of root cause analysis for recurring Supply Chain and Warehousing issues, preventing disruptions and boosting efficiency.

Graduate Engineer Trainee, *Schneider Electric* ☐   Aug 2021 – Oct 2022 | Bangalore, India
- Eliminated frequent system and process errors by proactive resolution and monitoring alerts, **cutting monthly support tickets by 10%**, and ensuring smoother operations.
- Developed strong leadership and interpersonal skills by **driving automation and innovation initiatives** in a team of 40+ colleagues.
- Validated system reliability during platform upgrade by **testing 100+ programs** and helping fix subsequent issues, ensuring seamless operation and minimising post-upgrade issues.

PROJECTS

Temperature Prediction in Car Lamps Using Sun Load Data,   Jan 2025 – Sep 2025
Master Thesis, Volvo Cars ☐
- Built a **3D** simulation model on TAITherm to predict the temperatures across the rear lamp of the Volvo EX90, helping reduce performance and aesthetic defects due to sun load, along with reducing testing time and cost.
- **Cut reporting time by 40%** by writing Python scripts to compare simulation data from META and sensor readings, runtime trends, and highlight relative-error margins across multiple studies.
- Modified the model to a scalable framework adaptable to multiple vehicle components and models, enabling cross-project reuse and accelerating analysis for diverse designs.

Fluid Dynamics of Air-Borne Pathogen Droplets,   Nov 2024 – Jan 2025
Project in Multiphase Flow ☐
- Evaluated two modes of host-to-host pathogen transmission, coughing and sneezing, in a contained environment using **Lagrangian Particle Tracking (LPT).**
- Constructed the domain in Siemens NX, and the pathogen footprint was simulated in STAR-CCM+, where regions of high, medium and low contamination were demarcated.

Fluid-Structure Interaction Analysis on the Rear Wing of a Formula Student Car, *Project in Fluid-Structure Interaction* ⊡ — Oct 2024 – Jan 2025

- **Achieved 954 N of downforce at 100 km/h** and validated aerodynamic efficiency by coupling CFD and FEM solvers (ANSYS Fluent + ACP), ensuring less than 2 mm structural deformation under peak loading.
- **Enhanced rear wing stiffness and safety factor (≥1.5)** by optimizing CFRP/PVC sandwich layup orientation and thickness through composite FEM analysis and fluid–structure interaction validation.
- **Correlated aerodynamic and structural results across STAR-CCM+ and ANSYS platforms**, ensuring consistency between pressure field prediction and deformation response, improving model reliability for future design iterations.

Formula Student, Sep 2023 – Sep 2024
Aerodynamics, Chalmers University of Technology ⊡

- Engineered a **rear diffuser using Siemens NX that increased downforce by 18% and reduced drag by 8%**, validating results through CFD in STAR-CCM+ and wind tunnel correlation.
- Executed high-fidelity aeromap simulations for pitch, yaw and cornering, driving targeted refinements resulting in a **12% increase in aerodynamic performance**.
- Produced precision components by designing and manufacturing molds in-house, as **e-milling co-responsible**, ensuring on-time and superior quality parts.

FEM studies on a two-fluid heat exchanger with supercritical CO_2 as the working fluid, *Bachelor Thesis* ⊡ — Aug 2020 – May 2021

- **Reduced simulation time from 50 minutes (CFD) to 15 seconds (FEM)** by evaluating a double-pipe heat exchanger with supercritical CO_2, accurately measuring thermal performance.
- Validated FEM accuracy against CFD by developing a mathematical model, **achieving <5% deviation** in thermal performance predictions.
- Implemented predictive capability by **constructing a Neural Network with an R^2 of 0.988,** embedding it in the FEM solver to improve accuracy and reduce manual calibration.

AIAA DBF 2020, *Team Aeolus, PES University* ⊡ — Aug 2019 – May 2021

- Engineered aircraft design and dimensioning, optimising critical flight parameters, including take-off performance, turn radius, and lift-to-drag efficiency, also led the thermal/aero analysis. Fabricated the fixed-wing aircraft entirely in-house.
- **Secured 2nd place globally** in the design proposal stage at the AIAA DBF 2020 competition by presenting a high-impact, technically rigorous design solution that met stringent evaluation criteria.

EDUCATION

Master of Science in Applied Mechanics, Aug 2023 – Sep 2025 | Göteborg, Sweden
Chalmers University of Technology | GPA 4.5/5.0 ⊡

Bachelor of Technology in Mechanical Engineering, Aug 2017 – May 2021 | Bangalore, India
PES University | GPA 8.3/10 ⊡

- Specialisation in Thermo-Fluids Engineering.

LANGUAGES

English	**Urdu**	**German**	**Swedish**
Bilingual, IELTS band 8	*Full working proficiency*	*A1 Certification from Goethe-Institut, Max Müller Bhavan*	*Basic conversational*

REFERENCES

Prof. Lars Davidson, *Head of Division | Division of Fluid Dynamics,* Chalmers University of Technology
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