




# Shreyas Girish

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## WORK EXPERIENCE

 **MK4 WORLDWIDE (MEKANO4)** – LLIÇÀ DE VALL, BARCELONA, SPAIN

**INTERN - SIMULATION ENGINEER** – 24 MAR 2025 – 14 MAY 2025

- Performed linear and nonlinear structural simulations of post-tensioned **bridge anchorage components** such as **wedge assemblies, anchor plates, and bearing blocks** using **ANSYS Mechanical**, based on theories of **linear elasticity, plastic deformation, and contact mechanics**.
- Designed, iteratively refined, and optimized FE models in **Solid Edge and AutoCAD** by incorporating material properties, load cases, and boundary conditions; provided actionable results that informed design improvements and stress control.
- Engineered complex contact models for **wedge-anchor-cable** interfaces, considering **concrete cracking and steel plasticity** to replicate realistic load transfer behavior and improve the fidelity of stress/displacement outputs.
- Contributed to **product validation and design optimization**, ensuring that simulation results aligned with structural performance goals and informed decisions on geometric redesigns.
- Integrated ANSYS scripting to automate mesh refinement, boundary condition setups, and **report generation**, significantly streamlining documentation workflows and accelerating client delivery timelines.
- Collaborated with cross-functional, international teams, delivering high-quality simulation documentation and supporting knowledge transfer within the R&D group.

**Business or Sector:** Civil Engineering and Infrastructure | **Department:** R&D – Structural Systems

 **CSOLAR ESTRUCTURAS** – RIPOLLET, BARCELONA, SPAIN

**INTERN - CAD/CAE ENGINEER** – 1 OCT 2024 – 24 DEC 2024

- Engineered **15+ CFD models** in **ANSYS Fluent** for **roof-integrated solar systems** (CSA, CS-Direct), optimizing airflow to mitigate thermal hotspots and supporting validation in official ES-1228 design reports.
- Designed and prototyped self-supporting structural frames (CSWind Autoportante) using SolidWorks and AutoCAD, performing wind load simulations in accordance with EN 1991-1-4 to reinforce anchor zones and reduce buckling risks.
- Conducted **structural integrity analyses** using **Abaqus**, identifying high-stress areas and deformation points; delivered actionable recommendations that improved mechanical safety and system lifespan.
- Developed and validated **bolted-joint mounting solutions** (Fijaciones, CSWind EO), achieving 99% load-transfer efficiency through detailed simulation of contact and preload effects; authored ISO-compliant installation documentation.
- Performed **soil-structure FEA simulations** for **ground-mounted systems** (CS-Land, CS-Land Tor), certifying geotechnical stability under seismic conditions by limiting displacement to <5 mm, supporting 8 certification reports.
- Streamlined through **fatigue analysis**, extending design life by 30% under cyclic loads and producing 5 internal design optimization briefs for future R&D use.
- Led **integrated CFD-FEA simulations** for **solar carport solutions** (Parking Fotovoltaico), optimizing structural design to reduce material costs by 12% while maintaining full EN 1993 compliance; methodology presented at **ESSS Event**.
- Delivered expert-level presentations at industry events, showcasing advanced simulation methodologies and cross-functional insights to both technical and non-technical audiences.

**Business or Sector:** Renewable Energy / Solar Power | **Department:** Engineering – Product Development

 **FAURECIA CLEAN MOBILITY** – BENGALURU, INDIA

**SENIOR CFD ENGINEER - FULL TIME** – 1 JUL 2022 – 14 SEP 2022

- Led **CFD optimization projects** for automotive exhaust aftertreatment systems using **Star-CCM+** and **ANSYS Fluent**, focusing on performance, emission reduction, and thermal resilience.
- Optimized **acoustic valve behavior** through transient **CFD simulations**, reducing backpressure and attenuating noise transmission, while ensuring compliance with **Euro 6** standards.
- Engineered detailed **parametric CAD models** of **catalytic converters and diesel particulate filters** using **SolidWorks**, facilitating rapid design iterations that helped reduce physical prototyping costs.
- Conducted **DoE-based CFD studies** to validate SCR (Selective Catalytic Reduction) mixer designs, achieving 96% correlation with experimental data and improving urea dosing uniformity by 22%.
- Developed **advanced meshing techniques** for high-fidelity simulations, applying layered and adaptive meshes to capture complex flow transitions and chemical reactions in exhaust ducts.
- Pioneered **thermal-stress analyses** of exhaust systems, predicting creep life and thermal fatigue under **800°C exhaust gas conditions**; recommended material upgrades that significantly extended component durability.

- Automated **DOE workflows** for **ASDS (Ammonia Storage and Delivery System)** components, running 50+ parametric configurations to maximize NH<sub>3</sub> vaporization efficiency and cut validation time by 40%.
- Collaborated with **cross-functional teams** (mechanical, thermal, fluid and validation) to align simulation findings with design objectives and ensure integrated system-level performance improvements.

**Business or Sector:** Automotive Components and Systems | **Department:** Exhaust & Thermal Management Systems

 **COPEs TECH INDIA PVT. LTD.** – BANGALURU, INDIA

**CFD ANALYST / ENGINEER - FULL TIME** – 8 JUL 2019 – 31 MAY 2022

- Engineered **fluid and thermal simulations** for **automotive exhaust aftertreatment systems** (SCR, DPF) using **Star-CCM+**, **ANSYS Fluent**, and **HyperMesh**, optimizing flow distribution to achieve >95% urea mixing uniformity and supporting compliance with **Euro 6** emissions standards.
- Designed and parameterized **CATIA-based CAD models** for catalytic converters and muffler systems, enabling rapid iterations and reducing prototype turnaround time; supported integration with simulation-ready geometries in **AutoCAD**.
- Automated **meshing, preprocessing, and post-processing workflows** using **Python** and **TCL/TK**, reducing simulation setup time by 40% across 30+ projects and ensuring repeatability through standardized ISO-compliant output documentation.
- Executed **thermal-structural optimization** of **EHPG/EHRS components** at temperatures up to 850°C, improving heat recovery efficiency and extending component creep life through multi-physics simulations in HyperMesh and Fluent.
- Performed **CFD-vibroacoustic coupling simulations** for automotive acoustic valves, eliminating four critical resonance peaks and delivering up to 8 dB(A) noise reduction verified through OEM validation testing.
- Led **aerostructure simulation and design projects** for **lightweight aerospace components** using **Abaqus**, performing linear and nonlinear static simulations to evaluate structural integrity under dynamic loading and pressure cycles. Supported **composite material modeling** and **bolted-joint analysis for fuselage attachments**.
- Delivered high-quality, client-facing documentation and collaborated closely with design and validation teams to support performance tuning and integration of results into the product development lifecycle.

**Business or Sector:** Engineering Services (Automotive, Aerospace, Heavy Engineering) | **Department:** CAE & Virtual Validation

 **BHEL-EDN** – BENGALURU, INDIA

**INTERN – DESIGN AND TESTING ENGINEER** – 11 NOV 2018 – 14 DEC 2018

- Designed innovative **cold plates for traction systems** using **SolidWorks**, emphasizing thermal efficiency and manufacturing feasibility for railway and power electronics applications.
- Performed **thermal-structural FEA simulations in ANSYS Mechanical**, validating heat dissipation performance and structural stability under operational loads and vibration environments.
- Engineered **GD&T-compliant parametric models** integrating **SolidWorks** with downstream **HyperMesh meshing strategies**, improving simulation reliability, and ensuring production-ready geometries.
- Validated prototypes through **rigorous bench testing**, achieving over 95% correlation between experimental and simulated results, which enabled optimized heat spreader layout and improved material selection.
- Contributed to **weight reduction efforts** by applying topology-aware design refinement, leading to a lighter cold plate configuration without compromising thermal capacity or structural integrity.
- Authored concise technical reports and presented results to internal R&D stakeholders, ensuring seamless integration of simulation insights into subsequent design revisions.

**Business or Sector:** Power and Traction Electronics | **Department:** Thermal Management – Traction Systems

## EDUCATION AND TRAINING

27 SEP 2022 – 26 MAY 2025 Barcelona, Spain

**MASTER IN NUMERICAL METHODS** Universitat Politècnica de Catalunya

**Website** <https://www.upc.edu/en/masters/numerical-methods-in-engineering> | **Level in EQF** EQF level 8

3 AUG 2015 – 17 JUN 2019 Bengaluru, India

**BACHELOR IN MECHANICAL ENGINEERING** Visvesvaraya Technological University

**Website** <https://vtu.ac.in/en/> | **Level in EQF** EQF level 8

## PROJECTS

SEP 2024 – MAY 2025

**Operator Inference-Based Reduced Order Modeling for Nonlinear Structural Dynamics**

- Developed a **non-intrusive ROM framework** combining **Operator Inference (OpInf)** and **POD** to accelerate simulations in nonlinear structural dynamics.
- Applied the method to a **cantilever beam system** using **Kratos Multiphysics**, solved with **Newmark- $\beta$  integration** and **Newton-Raphson** for geometric and material nonlinearities.
- Learned system operators from full-order snapshots, achieving **>98% model reduction** while retaining high fidelity across varying loads and boundary conditions.
- Focused on **damping-free systems**, eigenmode behavior, and dynamic force response prediction.
- Integrated **Python-based tools** for data handling, matrix operations, and solver automation using **NumPy**, **SciPy**, **SVD**, and **Matplotlib**.

**Tools & Technologies:** Python, NumPy, SciPy, Matplotlib, Kratos Multiphysics, SVD, Newmark-β, Newton-Raphson, POD, Operator Inference.

JAN 2019 – JUN 2019

**Characterization of E-Glass Fiber Reinforced with Aluminum 8176 Metal Matrix Composite**

- Investigated mechanical properties of a **hybrid MMC** with **E-glass fiber** reinforcement in an **Al 8176 matrix**.
- Fabricated specimens using **stir casting**, ensuring uniform fiber dispersion and low porosity.
- Conducted **tensile, compression, hardness, and impact testing** to evaluate performance vs. unreinforced aluminum.
- Performed **microstructural analysis** via **optical microscopy and SEM** to assess fiber-matrix bonding and void distribution.
- Interpreted results to study **failure modes, load transfer**, and **fracture toughness** for potential lightweight structural applications.

**Tools & Techniques:** Stir Casting, UTM, SEM, Optical Microscopy, Composite Material Testing

**LANGUAGE SKILLS**

Mother tongue(s): **KANNADA**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1
GERMAN	A2	A2	A2	A2	A2
SPANISH	A1	A1	A1	A1	A1
HINDI	B2	B2	C1	C1	B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

**SKILLS**

**Simulation Methods**

computational fluid dynamics | Structural analysis | static/Dynamic Structural Analysis | Finiter Element Analysis | Thermal Analysis | Modal Analysis | ANSYS Eivgenvalue buckling | Fluid-structure Interaction | Environmental management system (ISO 14001)

**Programing**

Python (computer programming) | C++ | MATLAB | Matlab/Simulik

**CAD Modelling**

AutoCad 2D -3D | Solidworks software | CAD modelling with Catia V5 | AutoCAD and Inventor CAD program

**Simulation Softwares**

Engineering simulation (ANSYS) | Ansys Workbench, Ansys Fluent, Ansys APDL | FEM Abaqus | ANSYS Workbench (Simplified) | MSC PATRAN/NASTRAN | FEM calculation model and stress analysis: ANSYS (Workbench/Fluent)

**Documentation**

LaTeX (very good) | Microsoft Excel | Microsoft Office | Microsoft Powerpoint | Microsoft Word

**DRIVING LICENCE**

Driving Licence: B