Statement of Purpose

Application for Internship – CFD-FOSSEE

The purpose of my application is to contribute to and learn from the CFD-FOSSEE initiative by applying my background in programming, software structuring, and problem-solving to scientific and engineering workflows. I am particularly interested in building tools that reduce complexity for users while preserving flexibility and correctness.

As part of the screening tasks, I worked on **Task 1**, which involved designing a Python package implementing a binary tree with YAML serialization. This task emphasized clean software architecture, modularity, and testability. I structured the solution as an installable package with clearly separated responsibilities—node definition, tree operations, and YAML input/output—ensuring clean imports, minimal dependencies, and reproducible testing. This exercise reinforced the importance of writing code that is not only functional but also maintainable and evaluator-friendly.

Task 2 focuses on developing a Blender addon that serves as a GUI layer for constructing OpenFOAM cases. This problem resonates strongly with my interest in making complex systems more accessible. OpenFOAM offers immense power, but its verbose case dictionaries can be intimidating, especially for beginners. The proposed Blender-based GUI approach—using viewport interaction, UI widgets, and structured import/export—addresses this challenge by allowing users to visually build geometries and configure solver parameters without losing control over the underlying CFD setup.

Through this internship, I aim to deepen my understanding of Blender's Python API, OpenFOAM workflows, and scientific software development practices. At the same time, I hope to contribute by writing clean, modular, and extensible code that aligns with open-source principles and the broader goals of CFD-FOSSEE.

In the long term, I aspire to work at the intersection of **software engineering and computational science**, developing tools that lower barriers to advanced engineering analysis. I believe this internship provides an ideal environment to learn, contribute meaningfully, and grow as a developer working on impactful open-source projects.