

## PERFORMANCE EVALUATION LETTER

**Name of the student:** *Kiran Milind Kolhe*

**Institution where the internship has been performed:** Department of Computer Applications in Science & Engineering (CASE) at Barcelona Supercomputing Center (BSC)

**Name of the tutor or responsible:** Gerard Guillamet

I am pleased to confirm that *Mr. Kiran Milind Kolhe* has successfully completed the internship at the department of *Computer Applications in Science & Engineering (CASE) from Barcelona Supercomputing Center (BSC)*, working together with *postdoc researcher Gerard Guillamet*. *Mr. Kiran Milind Kolhe* has proven himself to be a dedicated, very skilled and motivated master student.

During the internship at CASE department from 01/06/2020 to 17/08/2020 (total of 450h), the following tasks has been accomplished:

TASK-1/ Literature review and code revision

- Literature review on explicit solution schemes applied in the finite element method.
- Understanding of the workflow of a computational solid mechanics code.
- Revision and understanding on the implementation of a new dissipative explicit solution scheme.

TASK-2/ Verification of an explicit solution scheme.

- Verification of the dissipative solution scheme using an example from the literature.
- Several analyses have been conducted on the test such as, time step size, mesh convergence and parallel performance.

TASK-3/ Validation in a complex engineering problem.

- A low velocity impact test problem was selected for the validation.
- The problem has been solved using both non-dissipative and dissipative solution schemes.
- The performance of each solution method has been evaluated.

With the achievement of the previous tasks, the student has gained a basic knowledge of a Finite Element (FE) parallel code to solve solid mechanic problems. Particularly, he has been focused on the use of explicit time integration schemes for complex problems. He has learned how to implement and validate a dissipative explicit scheme recently implemented in the FE code. Last but not least, he has gained knowledge working in an HPC environment to perform large scale simulations using a Supercomputer.

I have no doubt that *Mr. Kiran* will bring home valuable knowledge and experience from his internship at Barcelona Supercomputing Center and I hope that this experience becomes useful for his professional career.

14<sup>th</sup> August 2020



Postdoc researcher Gerard Guillamet