

Numerical Simulations and Machine Learning for Fatigue prediction

Introduction

The prediction of fatigue damage is fundamental, in order to prevent the failure of the structures and of the mechanical components. This is particularly important in the aerospace and off-shore sectors, where the structures are subjected to constant vibrations due to dynamic loads.

Modern sensors and devices allow for the acquisition of real-time data, but a strong effort is still required in order to post-process the recorded data, and in particular to compare it with numerical simulations results.

Objectives

The aim of the Thesis is to develop numerical algorithms, leveraging on Machine Learning approaches together with numerical simulation, in order to predict the fatigue damage accumulated by the structure in critical points.

Project partners

M3E (m3eweb.it) – A leading consultancy company, specialized in numerical simulations and scientific software development.

You will learn to

- Develop automatic pre-post processing tools for running multiple numerical simulation.
- Develop Machine Learning & Deep Learning algorithms for time series analysis.
- Collaborate with a team of technicians.
- Prepare Project Reports and Slide Deck in English.

Requirements

Basic knowledge of Data Science and Python. Basic knowledge of FEM simulations.

