Donato Perfetto, PhD
Expertise Overview

From his early academic studies, Donato Perfetto has faced the application of fibre-reinforced polymeric (FRP) composite materials in the structural field, focusing the attention on the assessment of the structural integrity of engineering primary and secondary structures.
His activities span various areas such as Structural Health Monitoring (SHM), experiments, Finite Element (FE) simulations, and Machine Learning (ML) for damage localization, as well as crashworthiness of composite structures.

The research activities related to the SHM can be summarised as follows:

- damage tolerance design philosophy, Non-Destructive Techniques (NDT), and SHM systems based on ultrasonic guided wave (UGW) propagation;
- tests and simulations of Low Velocity Impacts (LVIs) on both isotropic and composite coupons;
- experiments and FE analyses related to UGW propagation in isotropic and fibre-reinforced composite panels for damage detection, localisation, and classification (severity) through probabilistic imaging methods and ML approaches.

The activities related to vehicle crashworthiness for both ground and aerospace applications can be summarized as follows:

- composite crushing phenomena, drop test regulations, bird strike events, and aircraft certification processes;
- Finite Element (FE) modelling to simulate the crashworthiness and energy absorption properties of ground and aerospace vehicles made of advanced materials, and assessment against experiments in terms of global deformations, failures, local accelerations, and biomechanical injuries.