

Towards Off Line Programming for robotized NDT applications using Infrared Thermography

**Samuel Maillard¹, Camille Dubos², Antoine Aigueperse², Jean-Nicolas Frouart³,
Benoit Bazin³**

¹Safran Composites, Safran Composites, France, ¹Twin Robotics, Twin Robotics, France, ¹Safran Composites, Safran Composites, France

In order to satisfy industrial requirements, NDT are being more and more robotized. This paper focuses on the software side of this robotization, and especially about the simulation and Off Line Programming of the trajectory for complex shape parts. Flash thermography inspection will be here considered as an industrial use-case. In a first part, the preparation stage of the software utilization is detailed. It deals with the identification of the rules in relation with the inspection process. These rules are often naturally known by the manufacturing engineers but are usually not written. A few of these rules will be discussed. The second part will list and prioritize the mandatory tools to be include in a software of simulation and Off Line Programming software; e.g. excitation source, camera and tooling in the case of infrared inspection cells. Based on these elements, the mathematical concepts used to automatically generate the trajectories, avoid collision and optimize robot paths will be briefly described. The third part will allow the presentation of practical applications and will highlight both the benefits of Off Line Programming software and the opportunity to improve the digital thread in an industrial environment. A lesson learnt based on the comparison between manual and Off Line Programming will finally be discussed.