Title :

Intelligent control of laser welding process: application to lightweight structures

PhD topic :

The research objective is to manage the residual stress distribution and the deformation during welding, to ensure the mechanical and geometrical stability of welded assemblies. The development of an experimental tool for numerical computation will enable the modelling and simulation of residual stress field and deformation during welding, in order to achieve a correct final geometry by adaptive process control. This tool will rely on machine learning from the in-process data, and from the real-time and resulting geometry of the workpiece. Due to the large volume of datasets, a dedicated tool for data mining is envisaged. A Smart Manufacturing approach is proposed, coupling mechanical simulation of the process and in-process data exploitation.

Keywords: laser welding, deformation, simalulation, machine learning.

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