

Internship - Master 2 (M/W)

Machine Learning based Reverse engineering Reconstruction for Rapid Casting

The **MSMP-EA7350 Laboratory** (www.msmp.eu) with the **LISPEN-EA7515 Laboratory** (lispen.ensam.eu) brings together research activities on three Arts et Métiers sites around mechanics, surfaces and interfaces, materials and manufacturing processes, engineering design, 3D modeling, digital mock-up and product lifecycle management.

The scientific approach developed responds to a multi-physical and multi-scale approach to simulate manufacturing processes to ensure their overall control. The Multiphysics study of processes is supported by a multidisciplinary approach linking materials, mechanics and geometrical modeling.

Research Job description:

From an existing physical workpiece, that could be worn or incomplete, use metrology, 3D scan, topologic optimization, etc. to re-build a functional 3D CAD part. Establish an optimized procedure to do so, highlighting the limits of each technology/process according to the particularity of the part (size, complexity...).

The idea you need to explore is the use of machine learning techniques to identify and classify typical feature shapes of foundry parts in order to improve the 3D reconstruction of a functional and structured CAD model which can be use after for rapid casting simulation and optimization.

Skills required:

- Basic understanding the workpiece environment and production processes (casting and machining),
- Basic knowledge of 3D scanning techniques,
- Basic knowledge of 3D CAD modeling techniques (Catia software preferably),
- Good knowledge of Machine Learning techniques, classification, and at least one software tool associated

Final deliverable:

- A complete report of the study,
- A demonstrator of the approach proposed with results applied on, at least, three industrial use cases.

Duration:

- 6 months

Location:

Campus Arts et Métiers d'Aix en Provence
2 Cours des Arts et Métiers, 13617 Aix-en-Provence.

Profile:

You have a Master 2 level in Engineering Design / Materials / Mechanics / Physical measurement/Manufacturing.

You have a particular attraction for 3D CAD and manufacturing and for the application of IA/Machine Learning techniques to this fields; foundry is an asset. You have a developed analytical sense and you know how to be proactive.

You have a sense of initiative and are independent. You are recognized for your interpersonal skills and your team spirit. Finally, you are curious and rigorous.

New position: February 2021

Duration of the internship: 6 months

Contacts :

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