INSA Rennes recruits
Research Engineer in Robotics

**Department:** Research team «Mecaproce» INSA/LS2N  
**Location:** INSA Rennes, France  
**Job type:** Full-time, 9-months contract  
**Starting:** September-October 2023  
**Salary:** 3000 euros gross monthly salary  
**Annual leave:** 45 days

**Context**

In order to help the wind turbine market accelerate its transition towards a circular economy, project ZEBRA established a strategic consortium, which puts together actors from the whole value chain: from the making of primary materials to the recycling of the blades, throughout their manufacturing, operation and dismantlement.

Within this context, IRT Jules Verne is working on the automatization of the draping or local reinforcement processes with dry fiber, by means of a mobile manipulator equipped with the corresponding end-effector.

This robot must be designed whilst taking several parameters into account:

- Constraints specific to the materials being used: dimensions, masses, flexibilities, etc.
- Constraints specific to the draping or structural reinforcement processes with dry fiber: precisions, draping lengths, potential heating/pressures, repositioning, correction of defects, cuts, etc.
- Constraints resulting from the environment: Free space in the vicinity of the mould, temperature, accessibility, etc.
- Economic viability of the carrier, with respect to its cost and application range: adaptability to varying mould lengths and widths, curvatures, one robot for several moulds.

**Main activities**

IRT Jules Verne, in partnership with the INSA Rennes, is offering a research engineer position focused on the modelling and analysis of the robotic structures at stake within project ZEBRA. This includes carrying out the following tasks:

- Modelling and dynamic analysis of a mobile manipulator composed of a mobile base and a robot arm equipped with a draping head, moving over a mould so as to drape it and/or lay down dry fiber locally (contacts, plays, friction);
- Characterisation of the couplings between end-effector and carrier, for the process to be performed as well as possible;
- Comparison between dynamic model explicitly defined and CAD model developed via ADAMS;
- Assessment and optimization of the end-effector for its tasks;
- Dynamic parameter identification through trials on testbench;
- Taking the flexibilities of its various components into account, in order to fit with geometric and dynamic constraints;
Qualifications, Competencies

IRT Jules Verne and the INSA Rennes are looking for a motivated candidate, e.g. an engineer with or without a PhD in mechanics with experience in modelling of mechanical systems.

The candidate would ideally have:

- Experience in modelling of mechatronic systems via ADAMS software;
- Skills in mechanical design;
- Skills in calculus and optimization;
- Skills in the modelling of mechanical systems with flexibilities;

In particular, the candidate will be asked to be familiar with the below software:

- ADAMS
- CATIA
- MATLAB

Application procedure

Applications (cover letter, CV) must be sent by e-mail only to recruitement@insa-rennes.fr no later than August 25, 2023. Selected candidates will be invited to an interview at the end of August 2023.

For further information, please contact:

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