Automatic Identification and Generation of Robot Kinematics for Industrial Robots in DELMIA V5

Problem Description

Industrial robotics is a demanding area in terms of robust simulations. The simulation of the robotics solutions most often rely on PLM software limited to a certain selection of robots. However, as the variety increases in robotic solutions, the demand to achieve a robust simulation environment reaches out of the scope of what these software solutions provide in terms of kinematics and motion generation. Therefore, there is a need for an Application Programming Interface (API) that recognizes this variety, constructs a relevant kinematic chain and generate robot motion based on kinematics configuration.

The Assignment

- Find and apply the relevant theory of kinematics
- Construct an algorithm to analyze robots in DELMIA V5
- Synthesize the theory and algorithm in an API
- Set up a virtual experiment to test and verify the solution

The Expected Result

The students are expected to

- deliver an API that interacts with the target simulation software
- be able to report on the strengths and limitations of the generated theory and application

Relevant Skills

- **Fundamental** knowledge in kinematics
- **Basic** programming skills in VB, C# or other .NET languages
- **Fundamental** knowledge in MATLAB or Mathematica
- **Good** knowledge in device building in DELMIA/CATIA

* If the applicant(s) has successfully completed MPR213, the applicant is automatically considered eligible.
* All relevant information will be provided to the students regarding API development in the target software. Thus, no background skill is expected from the applicant(s) for this particular point.

Information

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