SDU

International
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in Robotics & Entrepreneurship

INDUSTRY CASE

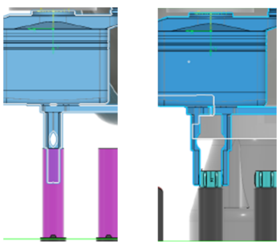
Odense - Denmark   Aug. 6th to Aug. 23rd 2024

#02_NOVO_B

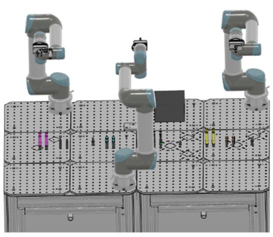
Computational gripper design (simulation)

Case description

Injection pens for insulin are an important product in Novo's portfolio. Today, they are assembled in high volumes on specialized automated production lines, but Novo investigates the utilization of more generic production stations with common robot arms to allow for covering the automated assembly of more product variants on the same production equipment. In such a scenario, the grippers are the crucial physical interface to robustly grasp and move the parts with robots.



Example of two grasping processes



Example of a generic assembly station

Challenge

Develop a simulation that can support the computational design of gripper finger geometries based on the geometries of the product parts – also considering changes to the existing part designs if necessary. Test the outcomes using dynamic simulation.

To get the team started, consider the following:

- Which are the relevant design parameters (e.g. angles and distances of gripper shapes)?
- Which are the relevant performance indicators (e.g. contact areas)?

Keywords: Computational design, parametric geometries, dynamic simulation

Tools, methods and materials

The challenge can be addressed with tools such as Matlab or other 3D simulation environments allowing for geometry manipulation and dynamic simulation. Regarding the methods, the team can take a mathematical/analytical approach or employ machine learning. The selection of tools and methods is left to the team. (Aljaz)

From Novo, the team will receive 3D CAD data of an injection pen mock-up, assembly instructions and physical product samples as input materials for the challenge. In addition, Novo will be available to discuss details of the challenge along the way.

Contact

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