ModuleWorks

Determination of the rotational contour in a turn-mill process

Maqsood Rajput

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ModuleWorks (represented by Claudio Schirrmann, Bastian Pranzas)

Turn milling is a machining process that allows to replace turning operations with milling, which has many advantages for example in terms of tool wear. In order to achieve that, the part is slowly rotated under the tool while the tool is milling away the material.

In this task we want to model a stationary example of this process and calculate the geometry of the finished workpiece. The milling tool is modeled as rotationally symmetric, as is the workpiece, since the model assumes an infinite rotational speed for both. The tool is fixed with the tool axis parallel to the Z-axis, the rotation axis of the workpiece is the X-axis (see figure 1).
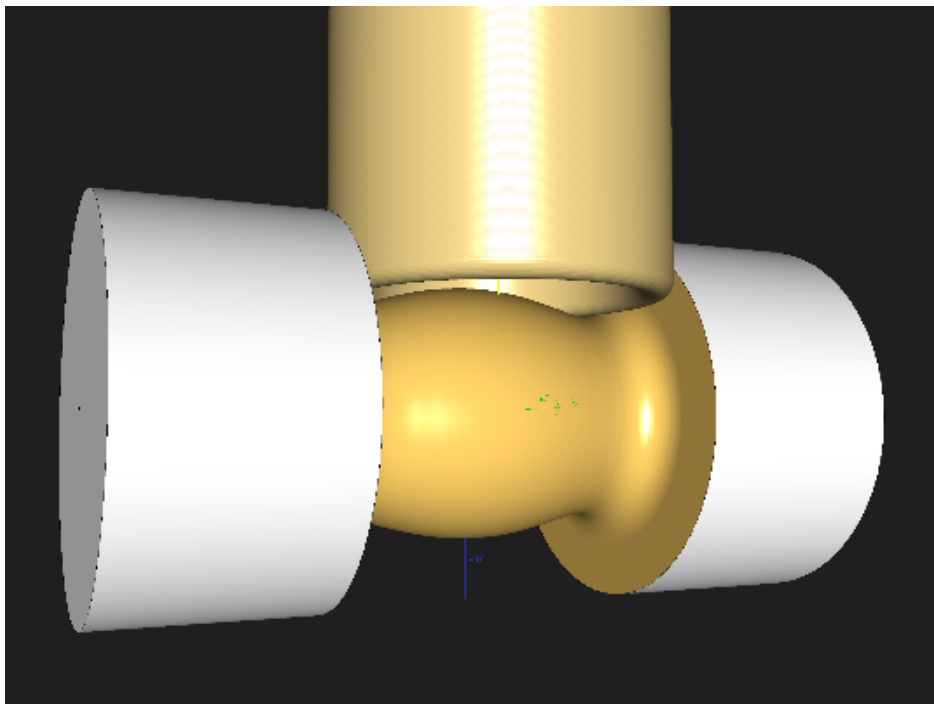

Abbildung 1: Milling process

Given

We are given with:

- Radius and position of the tool

- Radius and length of the workpiece

Your Task

Given the abvove information determine the rotational contour of the workpiece after the milling process. Therefore, develop an algorithm which, depending on the geometry and position of the tool, can approximate the rotational contour obtained and represent it in the form of a piecewise linear defined polyline (see figure 2).
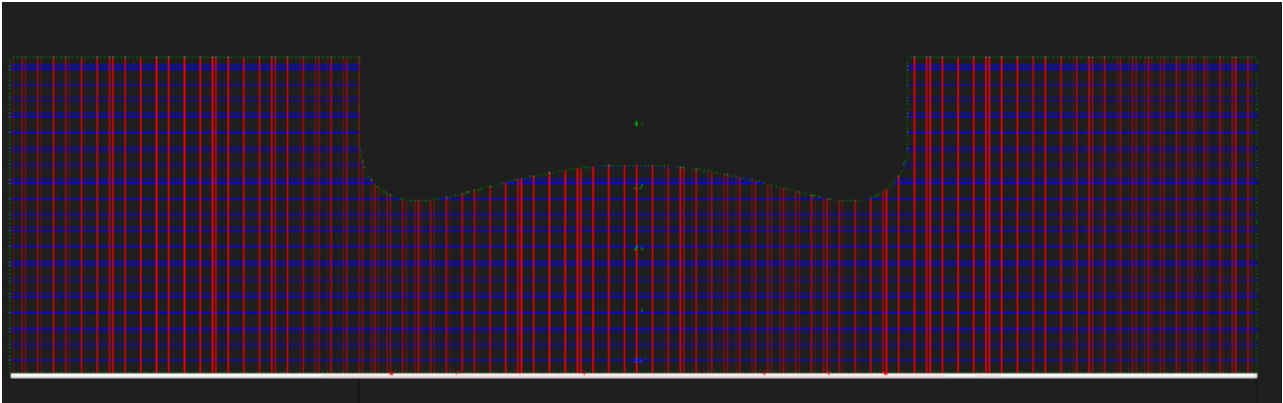

Abbildung 2: Polyline of a workpiece after the milling process

More on the topic of turn milling and other machining processes you can find on:
`www.moduleworks.com`

Good luck!