

SUMMARY

The process of milling with industrial robot has a great advantage over milling with conventional CNC machine tools by providing much bigger working area. Even though the stiffness of the industrial robots is low, the processing of material of low hardness is possible. However, neither regular robot path programming nor NC paths can be applied for robotic machining; the different approach is required. The software for robotic machining programming should combine both functions of both machining path programming and the robotic simulation tools.

The aim of this thesis was to create a procedure for programming of milling operations for robotic milling system in TalTech. The objective of the thesis was fulfilled. In the course of thesis, the procedure for programming and also the templates of the system layout were developed and can be used in the future.

Siemens NX is an advanced NC programming tool, which provides comprehensive tools for a creation of various geometry based tool path. The solution developed in this software sufficiently simplify programming procedure, since the tool paths are generated automatically based on the feature parameters and defined cutting tool with only few robot specific modifications to be added. The software is suitable for both roughing and finishing operations; however, further adjustments in RobotStudio might be required.

The process of robotic machining programming in ABB RobotStudio provides more control over path geometry and tool orientation, but also the paths may contain more inaccuracies, which can be corrected only manually. Tool paths generated by this software are suitable only for finishing purposes.

As a conclusion, thesis is considered to be successful, the objective of robotic machining path planning was fulfilled and the solutions can be used for further development of robotic machining in TalTech. Further works, may include the operations for setting up the work piece for machining and measuring the length of the cutting tool. The procedure for adjustment of cutting parameters (spindle speed and cutting feed) based on the feedback from force sensor could be also implemented.