

54th CIRP Conference on Manufacturing Systems

Method for Data-Driven NC-Code Optimization based on Dixel Material Removal Simulation and Tool Holder Vibration Measurements

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Abstract

This paper presents a novel approach for data-driven NC-Code optimization, based on the integration of dixel-based material removal simulation and an instrumented tool holder, capable to measure vibrations during milling close to the cutting zone. Considering measured cutting vibrations, machine tool axis and NC-line data, a model has been developed optimizing cutting parameters to generate a NC-Code right after a first machining trial with mitigated vibration effects. Different modules for human-assisting vibration visualization and automated optimization of cutting parameters are presented, using milling use-cases implemented on a CNC machining center.

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Peer-review under responsibility of the scientific committee of the 54th CIRP Conference on Manufacturing System

Keywords: Milling, CAD/CAM, Vibration, Multidixel Model, NC-Code Optimization
