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# A Synthesis-based Tool Path Planning Approach for Machining Operations

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## Abstract

The planning of machining operations for components using CAM requires careful consideration by highly trained personnel, with rising complexity in part requirements. This work proposes a novel domain-specific planning technique using Combinatory Logic Synthesis to generate a multitude of tool paths. By analyzing current state CNC path planning algorithms, motion primitives are identified and implemented in a modular representation using software components. Thus, a large variety of path planning strategies can be generated, while maintaining a multitude of different boundary constraints and productivity metrics. These solutions are subjected to geometric physically-based simulations in order to validate their ranking and compliance.

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