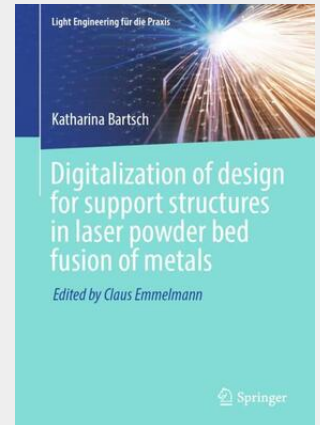


Digitalization of design for support structures in laser powder bed fusion of metals

Additive manufacturing is considered a key technology for digital production. However, several barriers towards the broad industrial application exist, e.g. the associated cost and the required experience regarding the manufacturing process. To eradicate these barriers, the complete digitalization of the value creation process is needed. In this thesis, a digital, automated support structure design procedure is developed. Topology optimization is used for design rule determination, and the space colonization algorithm is adapted for the automated design. The validity of the procedure is proven experimentally, revealing sufficient mechanical performance alongside cost reduction at medium to large production scales.

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