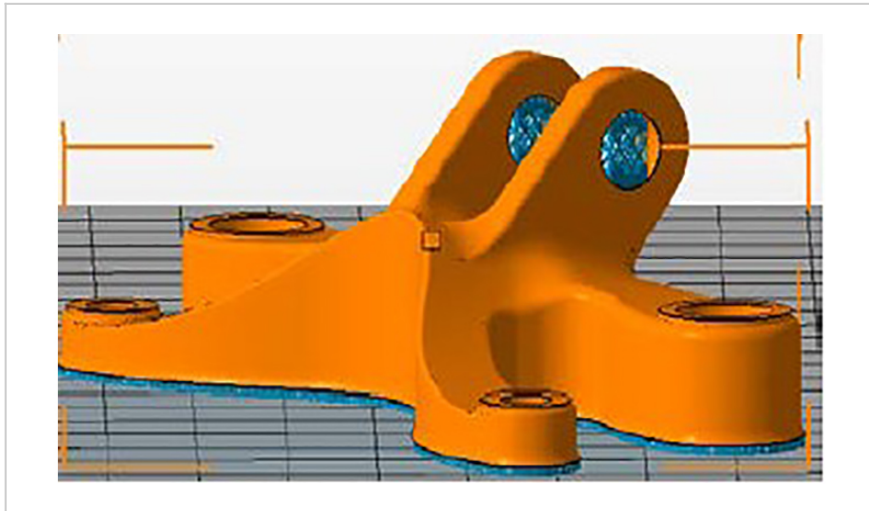


# Build Orientation for Minimizing Thermal Distortion in Metal AM

ID# 2019-4985



A part positioned using the heuristic

## Technology Summary

Thermal distortion significantly impacts the dimensional accuracy, mechanical properties, and build success of laser-based powder bed fusion (PBF). Determining the best build orientation to minimize distortion currently requires extensive simulation and computational power as candidate orientations are evaluated. We have developed a fast heuristic for finding a part's build orientation to minimize thermal distortion when using laser PBF.

## Application & Market Utility

Pre-processing in PBF additive manufacturing can be tedious and time-consuming, requiring many iterations and an experienced user. The build orientations generated with the fast heuristic were simulated to demonstrate its effectiveness with a range of parts and materials. The fast heuristic yields equivalent (or better) results when compared to several commercial software packages in significantly less time and with minimal computation.

## Next Steps

Research team is seeking licensing opportunities.

**TECHNOLOGY READINESS LEVEL**

**4-7**

### Seeking

Investment | Licensing | Research

### Keywords

- powder bed fusion
- minimum thermal distortion
- building orientation

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