

Adaptive Layer Height During DLP Materials Processing - DTU Orbit (08/11/2017)

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This research aim to show how manufacturing speeds during vat polymerisation can be vastly increased through an adaptive layer height strategy that takes the geometry into account through analysis of the relationship between layer height, cross-section variability and surface structure. This allows for considerable process speedup during the Additive Manufacture of components that contain areas of low cross-section variability, at no loss of surface quality. The adaptive slicing strategy was tested with a purpose built vat polymerisation system and numerical engine designed and constructed to serve as a Next-Gen technology platform. By means of assessing hemispherical manufactured test specimen and through 3D surface mapping with variable-focus microscopy and confocal microscopy, a balance between minimal loss of surface quality with a maximal increase of manufacturing rate has been identified as a simple angle-dependent rule. The achievable increase in manufacturing rate was above 38% compared to conventional part slicing.

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