# Variable-width contouring for Additive Manufacturing

Presenté au GTMG 2020 par Samuel Hornus

In most layered additive manufacturing processes, a tool solidifies or deposits material while following pre-planned trajectories to form solid *beads*. Many interesting problems arise in this context, among which one concerns the planning of trajectories for filling a planar shape as densely as possible. This is the problem we tackle in the present paper. Recent works have shown that allowing the bead width to vary along the trajectories helps increase the filling density. We present a novel technique that, given a deposition width range, constructs a set of closed beads whose width varies within the prescribed range and fill the input shape. The technique outperforms the state of the art in important metrics: filling density (while still guaranteeing the absence of bead overlap) and trajectories smoothness. We give a detailed geometric description of our algorithm, explore its behavior on example inputs and provide a statistical comparison with the state of the art. We show that it is possible to obtain high quality fabricated layers on commodity FDM printers.

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