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»IMPACT ON SCIENCE«
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»Displaced Signed Distance Fields for Additive Manufacturing«

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PROBLEM

- Displacement maps are a compact well established method for modeling meso-scale surface details.
- For 3D-printing details have to be modeled explicitly resulting in excessive storage, transmission and processing costs.
- How to efficiently integrate Displacement Maps into the 3D printing process in order to
  - produce highly detailed surfaces from low-polygon meshes with an attached displacement map
  - produce smooth surfaces from low-polygon meshes of higher order primitives?
RESULT

- Novel unified implicit representation for displacement maps
- Novel algorithmic framework for printing 3D objects represented using displacement maps
- Fully integrated into existing 3D printer driver (Cuttlefish®)

USP

- The novel implicit representation
  - supports unbounded displacement and performs no further tessellation or refinement
  - robustly handles incomplete, non-manifold and self-overlapping input
  - algorithmically efficient