

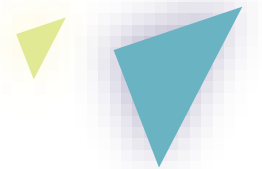
# COMPUTER GRAPHICS NIGHT

Thursday, November 30, 2023

## BEST PAPER AWARD

PREISTRÄGER

»IMPACT ON SCIENCE«



# Best Paper Award

**PREISTRÄGER**  
»IMPACT ON SCIENCE«



Morsy Abdelkader Morsy, Mostafa (Fraunhofer IGD / TU Darmstadt)  
Brunton, Alan (Fraunhofer IGD)  
Urban, Philipp (Fraunhofer IGD / NTNU)

»Shape Dithering for 3D Printing«

*ACM Transactions on Graphics (TOG) 41, no. 4 (2022): 1-12.*

# Best Paper Award

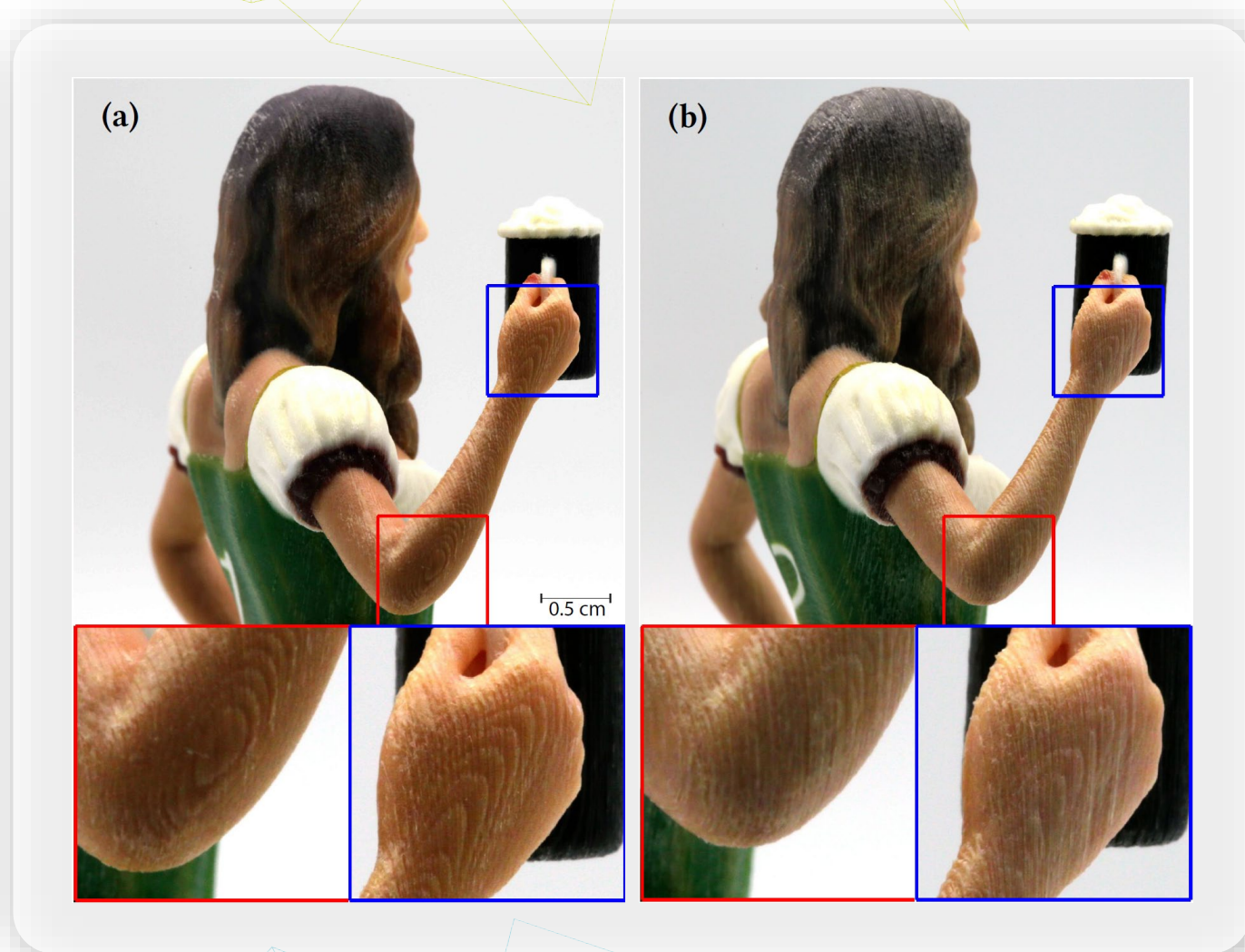
PREISTRÄGER

»IMPACT ON SCIENCE«



## PROBLEM

- Stair-case artifacts in 3D printing processes are visually and structurally disruptive quantization errors that occur due to the layer-by-layer construction inherent in conventional 3D printing (a).
- Existing techniques are limited to specific surface orientation, introduce considerable extra computation, and do not remove all artifacts (b).



# Best Paper Award

PREISTRÄGER

»IMPACT ON SCIENCE«



## RESULT

- The paper presents an efficient algorithm that enhances 3D print surface quality by reducing voxelization artifacts, without affecting color accuracy and with minimal extra computation.
- It introduces a high-frequency dithering process using a 3D blue-noise mask that shifts unwanted quantization noise to higher frequencies, which are then largely removed by the printer's low-pass filter, as evidenced by rigorous accuracy tests.



## USP

- The paper makes a significant theoretical contribution to the field of 3D printing by introducing a novel dithering algorithm.
- It provides a comprehensive and clear review of related work, setting the context for its innovation.
- The method is empirically validated to improve surface quality while preserving geometric accuracy.

