COMPUTER GRAPHICS NIGHT

DONNERSTAG 05.12.2024

BEST PAPER AWARD

PREISTRÄGER

»IMPACT ON BUSINESS«

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Best Paper Award

»Impact on Business«

»Meso-Facets for Goniochromatic 3D Printing«

PREISTRÄGER

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ACM transactions on graphics

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PROBLEM

Produce goniochromatic effects—color changes depending on the viewing direction—on arbitrary 3D surfaces using multi-material 3D printing.

- Creating meso-facets (micro-scale structures that reflect light directionally) at high resolutions can lead to impractical complexities and processing challenges for even moderately sized prints.
- Material-jetting 3D printers have resolution limits and anisotropic inaccuracies, affecting precise placement and alignment of printed materials.
- Translucency of 3D printing materials can cause light to scatter within a print, leading to color blending (cross-talk) that diminishes the goniochromatic effect.

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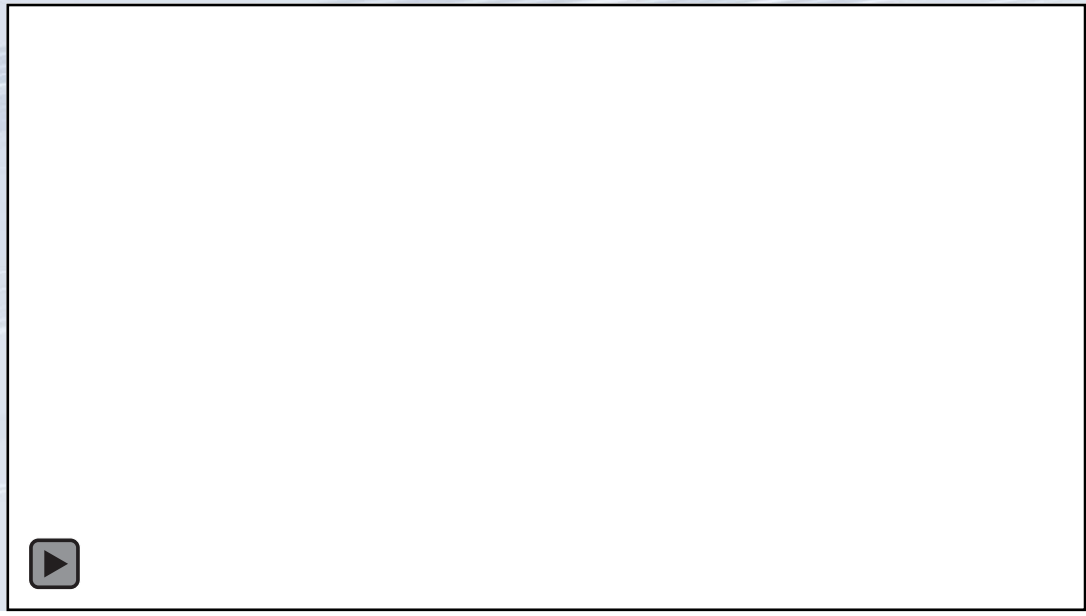
RESULT

Scalable algorithm to procedurally augment 3D surfaces with meso-facets

- Facets enable distinct colors to be assigned to different viewing angles with minimal alteration to the original surface geometry.
- Relies on implicit surface representations to achieve near-device resolution w/o additional tessellation or post-processing.

USP

- This paper's unique combination of technical simplicity, minimal surface alteration, scalability, and creative flexibility provides a practical, user-friendly framework that competes effectively against methods requiring specialized hardware, multi-step processes, or computationally intensive modeling.