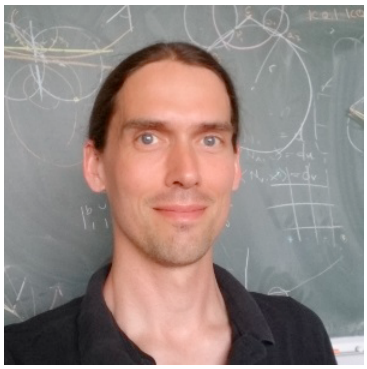
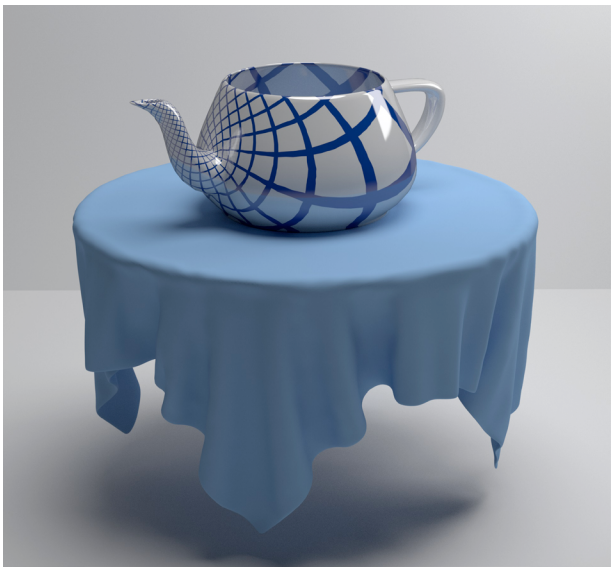
Stefan Sechelmann & Thilo Rörig *Conformal Patterns on Ceramics*





Bio:
Stefan Sechelmann was born in 1980 in Berlin, Germany. In 2007 he received a diploma in mathematics (Dipl. Math.-Techn.) of Berlin Institute of Technology. He worked together with his advisor Prof. Alexander Bobenko in the field of discrete differential geometry and received his PhD. in 2016 (Dr. rer. nat., summa cum laude). Together with Thilo Rörig he founded varylab.com, a service that provides surface optimization for architects and engineers. Currently Stefan is founding a company, sopher.io, that provides secure communication for teams together with two close friends. Stefan is a Berlin Startup Scholarship apprentice.

Project description:
We create conformal patterns on ceramics. The presented instance features a seamless grid pattern that was created by mapping the surface of the teapot to a rectangle. The mapping algorithm is based on the mathematical theory of discrete conformal equivalence of triangle meshes. We developed software to interactively calculate mappings on digital surfaces. The concept for the current exhibit was developed in close cooperation with Thilo Rörig.

Mathematical inspiration:
The foundations of the theory of discrete conformal equivalence of triangle meshes have been developed by Alexander Bobenko, Ulrich Pinkall, Peter Schröder, and Boris Springborn at Berlin Institute of Technology and California Institute of Technology. Two combinatorially equal triangle meshes are considered discrete conformal equivalent if there exist scale factors associated with the vertices of the mesh with the following property: Two corresponding edges have the same length if scaled (multiplied) with the scale factors at their ends. The theory of discrete conformal equivalence gives rise to the concept of discrete conformal maps. We have developed algorithms that calculate scale factors for triangulated surfaces such that the resulting discreet conformal equivalent surface is contained in the Euclidean plane. Such a map can be used to create texture maps on a digital triangulated surface such as the teapot.

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