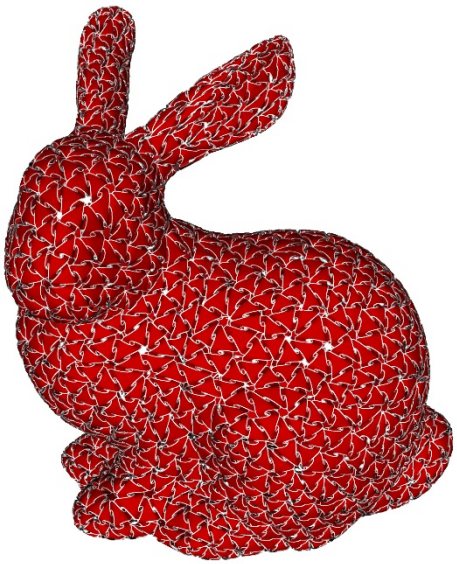
Branched Covering Surfaces

Multivalued functions and differential forms naturally lead to the concept of branched covering surfaces and more generally of branched covering manifolds in the spirit of Hermann Weyl's book "Die Idee der Riemannschen Fläche" from 1913. This talk will illustrate and discretize basic concepts of branched (simplicial) covering surfaces starting from complex analysis and surface theory up to their recent appearance in geometry processing algorithms and artistic mathematical designs. Applications will touch differential based surface modeling, image and geometry retargeting, global surface and volume remeshing, and novel weaved geometry representations with recent industrial applications.



Biography

Konrad Polthier is full professor of mathematics at Freie Universität Berlin since 2005. He received his PhD from University of Bonn in 1994, and headed research groups a Technische Universität Berlin and Zuse Institute Berlin before joining FU Berlin. His research focuses on discrete differential geometry, applied geometry, geometry processing and mathematical visualization. His research results have been applied in industry such as computer graphics, computer aided design and architecture. Dr. Polthier has written and co-edited books on mathematical visualization and produced mathematical video films. His video “MESH – A Journey through Discrete Geometry” (www.mesh-film.de joint with animator Beau Janzen, Los Angeles) has received international awards including "Best Animation" at the New York International Independent Film Festival. Polthier served as conference chair on international conferences including ACM/Eurographics Symposium on Geometry Processing and SIAM Geometric Design. His professional positions include chair of the Berlin Mathematical School, board member of the Matheon research center and chair of the Berlin Mathematical Society. Since May 2014 he serves as editor in chief of the journal Computer Aided Geometric Design. For details see his homepage at http://www.polthier.info