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Quasiconformal almost parametrizations of metric surfaces

The classical uniformization theorem states that every smooth Riemann surface is conformally diffeomorphic to a surface of constant curvature. The uniformization problem for metric spaces now asks to find conditions on a given metric space X, homeomorphic to some model space, under which there exists a homeomorphism from the model space to X with good geometric and analytic properties.

We consider the case where X is a two-dimensional metric surface of locally finite Hausdorff 2-measure and show that if X is locally geodesic, then any Jordan domain in X of finite boundary length admits a quasiconformal almost parametrization. The proof makes use of the theory of energy and area minimizing Sobolev discs developed by Lytchak and Wenger. A large part of this talk is devoted to the existence of Sobolev discs spanning a given Jordan curve in X. This is joint work with Stefan Wenger.