

## **From tiling and packing to uniformization via combinatorial harmonic maps**

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The celebrated Riemann mapping theorem asserts that a non-empty simply connected open subset of the complex plane which is not the whole of it is conformally equivalent to the open unit disk in the complex plane.

How should one visualize this conformal map?

We will start with a remarkable conjecture by Thurston which was first proved by Rodin-Sullivan, continue with related work of Dehn, Schramm and Cannon-Floyd-Parry that involves tiling by squares, and then describe our current research directions aim at addressing more general questions such as:

Given a surface endowed with some combinatorial structure, such as a triangulation, can one obtain effective versions of classical uniformization theorems by varying the triangulation?