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Wai Yeung Lam* (lam@math.brown.edu). *Minimal surfaces from deformations of circle patterns.*

William Thurston introduced circle packings to approximate holomorphic functions. Burt Rodin and Dennis Sullivan proved the convergence of the analogue of Riemann maps for circle packings. Oded Schramm further extended the idea by considering circle patterns, where circles are allowed to intersect with each other.

We present a discrete analogue of the Weierstrass representation for minimal surfaces in terms of data from infinitesimal deformations of circle patterns. Given a triangle mesh in the plane, a circle pattern is induced by the circumscribed circles. We investigate infinitesimal deformations of the triangle mesh that preserve the intersection angles of the circumscribed circles. By analyzing the change in cross ratios, every such an infinitesimal deformation yields a polyhedral surface with vanishing mean curvature. With this approach, we unify previous notions of discrete minimal surfaces.

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