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Buyang Li received his Ph.D. degree from City University of Hong Kong in 2012. He was engaged in scientific research and teaching at Nanjing University, University of Tübingen (Germany), and The Hong Kong Polytechnic University. He is currently Full Professor at The Hong Kong Polytechnic University and Research Fellow of The Hong Kong Research Grants Council. His main research areas are scientific computing and numerical analysis for partial differential equations from geometry, physics and engineering problems, including finite element approximation of geometric partial differential equations and free boundary problems, numerical approximation of rough solutions of nonlinear dispersion and wave equations, numerical methods and analysis for incompressible Navier–Stokes equations, among others.

Title: Convergent finite element approximations of surface evolution with artificial tangential motion

Abstract:
The finite element approximation of surface evolution under external velocity field is studied. A tangential motion is designed, by using harmonic map heat flow from a reference surface onto the evolving surface, to improve the mesh quality of the numerically computed surface. The convergence of evolving finite element approximations to the surface evolution driven by a specified vector field with the proposed tangential motion is proved for finite elements of degree $k\geq 3$. Numerical examples are provided to demonstrate the convergence of the algorithm and its effectiveness for improving the mesh quality of the numerically computed evolving surface.