Geometric Optimization Algorithms for Variational Problems

Abstract:
Variational problems in geometry, fabrication, learning, and related applications lead to structured numerical optimization problems for which generic algorithms exhibit inefficient or unstable performance. Rather than viewing the particularities of these problems as barriers to scalability, in this talk we embrace them as added structure that can be leveraged to design large-scale and efficient techniques specialized to applications with geometrically structure variables. We explore this theme through the lens of case studies in surface parameterization, optimal transport, and multi-objective design.