Lower semicontinuity for superlinear quasiconvex functionals in BV

Parth Soneji

An overview is given of some key issues and definitions in the Calculus of Variations, with a focus on lower semicontinuity and quasiconvexity. Some well known results and instructive counterexamples are also discussed. We then move to consider variational problems in the BV setting, and present a new lower semicontinuity result for quasiconvex integrals of subquadratic growth. The proof of this requires some interesting techniques, such as obtaining boundedness properties for an extension operator, and exploiting fine properties of Sobolev maps.