Allard's Interior Regularity Theorem in Alexandrov Spaces

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Allard's interior ε-regularity theorem in Riemannian manifolds traditionally relies on Nash's isometric embedding theorem, which ensures an isometric embedding of the manifold into a higher-dimensional Euclidean space. However, Nash's isometric embedding theorem remains an open problem for $\mathcal{C}^2$ Riemannian manifolds.In this talk, we will present an intrinsic approach to Allard's interior ε-regularity theorem in $\mathcal{C}^2$ Riemannian manifolds that does not depend on Nash's isometric embedding theorem. We will also present Allard's interior ε-regularity theorem in Alexandrov spaces of dimension n with double-sided intrinsic sectional curvature bounds and discuss the main difficulties in proving it.

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