
SHAH ROSHAN-ZAMIR, University of Nebraska-Lincoln
Interpolation in the Weighted Projective Space

Given a finite set of points X in the projective space over a field k one can ask for the k -vector space dimension of all degree d polynomials that vanish to order two on X . (These are polynomials whose first derivative vanishes on X .) The Alexander-Hirschowitz theorem (A-H) computes this dimension in terms of the multiplicity of the points and the k -vector space dimension of degree d monomials, with finitely many exceptions. In this talk, we investigate this question in the weighted projective line and space, $\mathbb{P}(s, t)$ and $\mathbb{P}(a, b, c)$. We define a notion of multiplicity for weighted spaces, give an example of $\mathbb{P}(a, b, c)$ where A-H holds with no exceptions and an infinite family where A-H fails for even one point, and discuss future directions.