

Minimal Euclidean Distance degree of Segre-Veronese varieties

Khazhgali Kozhasov

Université Côte d'Azur, France

Khazhgali.kozhasov@univ-cotedazur.fr

The Euclidean Distance degree $\text{EDdeg}_Q(X)$ of an algebraic variety X in an inner product space (R^N, Q) counts the number of complex critical points of the distance function from a generic point in R^N to X . Since this invariant of X depends on Q , it is a natural problem to find or characterize inner products Q that correspond to the minimal possible $\text{EDdeg}_Q(X)$. In my talk I will discuss this question for Segre-Veronese varieties, which consist of rank-one (partially symmetric) tensors. I will show that with respect to the classical Frobenius product F , the variety X of $n \times m$ rank-one matrices has smallest $\text{EDdeg}_F(X) = \min(n, m)$, whereas $\text{EDdeg}_Q(X)$ with respect to a sufficiently general inner product Q on $R^N = R^{nm}$ is much higher.

Joint work with Alan Muniz, Luca Sodomaco and Yang Qi.