
IHSAN TOPALOGLU, Virginia Commonwealth University

Riesz-type inequalities and overdetermined problems for triangles and quadrilaterals

In this talk I will consider Riesz-type nonlocal interaction energies over convex polygons. After proving the analog of the Riesz inequality in this discrete setting for triangles and quadrilaterals, and obtaining that among all N -gons with fixed area, the nonlocal energy is maximized by a regular polygon, for $N = 3, 4$, I will present on the necessary first-order stationarity conditions for a polygon with respect to a restricted class of variations, which is then used to characterize regular N -gons, for $N = 3, 4$, as solutions to an overdetermined free boundary problem. This is a joint project with Marco Bonacini and Riccardo Cristoferi.