

Abstract

Building on the work of A. Colesanti, M. Ludwig, and F. Mussnig, who established a functional analogue of Hadwiger's theorem characterizing functional intrinsic volumes on the space of super-coercive convex functions, we investigate a new family of valuations, with a focus on vector-valued ones.

We introduce functional Minkowski vectors, which are continuous, vector-valued valuations that are epi-translation invariant and rotation equivariant. We provide a characterization of these valuations in terms of Hessian measures and special mixed Monge–Ampère measures. They arise naturally from a Steiner formula applied to a functional analogue of the moment vector, which we also characterize.

As an application in integral geometry, we derive an additive kinematic formula involving the functional Minkowski vectors.