Morvan

Generalized Curvatures

The central object of this book is the measure of geometric quantities describing N a subset of the Euclidean space (E ,), endowed with its standard scalar product. Let us state precisely what we mean by a geometric quantity. Consider a subset N S of points of the N-dimensional Euclidean space E, endowed with its standard N scalar product. LetG be the group of rigid motions of E. We say that a 0 quantity Q(S) associated toS is geometric with respect toG if the corresponding 0 quantity Q[g(S)] associated to g(S) equals Q(S), for all g?G. For instance, the 0 diameter ofS and the area of the convex hull ofS are quantities geometric with respect toG. But the distance from the origin O to the closest point ofS is not, 0 since it is not invariant under translations ofS. It is important to point out that the property of being geometric depends on the chosen group. For instance, ifG is the 1 N group of projective transformations of E, then the property ofS being a circle is geometric forG but not forG, while the property of being a conic or a straight 0 1 line is geometric for bothG andG. This point of view may be generalized to any 0 1 subsetS of any vector space E endowed with a groupG acting on it.

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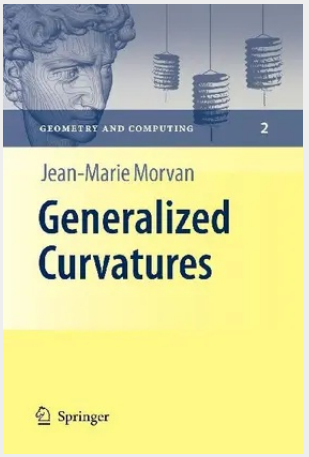

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