

ON STATISTICAL MANIFOLD WITH DUAL CONNECTION AND ITS APPLICATIONS

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Abstract

Statistical manifolds was introduced by Amari in 1985. He has studied statistical manifolds in terms of information geometry. Since the geometry of such manifolds includes the notion of dual connection, also called conjugate connection in affine geometry, it is closely related to affine differential geometry. A statistical manifold is, in short, a Riemannian manifold (M, g) with one additional structure given by a torsion-free and symmetric affine connection ∇ and its dual connection ∇^* , which is also assumed to be torsion-free; we say ∇ and ∇^* are mutually dual whenever $Xg(Y, Z) = g(\nabla_X Y, Z) + g(Y, \nabla_X^* Z)$ holds for all vector fields X, Y, Z on M . In this paper, we gave some fundamental definitions and theorems, then we studied statistical manifolds with dual connection and its applications.

Keywords: Statistical manifold, statistical structure, dual connection

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