

Doubly autoparallel structure on statistical manifolds and its applications

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One of the important feature of information geometry [1] is a pair of mutually dual affine connections. In statistical manifold there exists a submanifold that is simultaneously autoparallel with respect to both of the affine connections. Such submanifolds, which we call *doubly autoparallel*, play interesting and important roles in applications, e.g., MLE of structured covariance matrices, semidefinite program (SDP) [2, 3], the self-similar solutions to the porous medium equation [4] and so on.

We discuss several properties of doubly autoparallel submanifolds and show a characterization in terms of Jordan algebra when their ambient space is a symmetric cone.

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Keywords: mutually dual affine connections, doubly autoparallel submanifold, symmetric cone

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