

# Geometry of affine immersions and construction of geometric divergences

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Affine differential geometry (ADG) is to study hypersurfaces or immersions which are affinely congruent in an affine space. It is known that dual affine connections and statistical manifold structures naturally arise in this framework. In particular, generalized conformal transformations of statistical manifolds have important roles in ADG. Originally, such generalized conformal transformations were introduced in asymptotic theory of sequential estimations in information geometry. In addition, by latest developments of Tsallis nonextensive statistical physics, importance of these conformal structures are rapidly increasing. In this presentation, we summarize geometry of generalized conformal structures on statistical manifolds from the viewpoint of ADG. After that, we apply ADG for construction of divergence functions. Recently, generalized means and divergence functions of non KL-type have been discussed in Tsallis statistics. Therefore, we elucidate geometric meanings of generalized means using generalized conformal structures, and we consider generalization of canonical divergence from the viewpoint of ADG.