Collegio Carlo Alberto, Turin, Italy

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Non-Commutative Information Geometry

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Information geometry is concerned with the study of statistical manifolds. These are differentiable manifolds consisting of probability distributions. In the parameterized case their geometry is described by a metric tensor and a pair of dually flat connections. In the more general non-parameterized case they are Banach manifolds. This area of research is still developing and has applications in many domains.

My interest in this domain is twofold. The notion of an exponential family of statistical models can be generalized by introducing deformed exponential functions. More recently, I made some progress in the study of manifolds of quantum states, more specifically, states on a von Neumann algebra. I review what is known in the case of states on the algebra of N-times-N matrices and discuss the difficulties encountered when trying to generalize these results.

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