

SOME TRANSFORMATIONS OF MARKOV PROCESSES LEADING TO CURVATURE

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The first transformation we have in mind is a time-symmetric analogue of Doob's h-transform which we call (f,g)-transform. It leads to the notion of "entropic interpolation" between two probability measures on a state space. It is a stochastic analogue of McCann's interpolation which allows both recovering the basic results of the Bakry-Emery theory on a Riemannian manifold and extending it to a graph structure when considering continuous-time random walks, suggesting a natural definition of Ricci curvature on a graph.

The second transformation consists of slowing down to constant paths the (f,g)-transformed processes. In this limit, the entropic interpolation tends to some transport interpolation : a quadratic transport interpolation (McCann) in the Riemannian setting and a metric transport interpolation in the graph setting.

We also consider some related functional inequalities: modified logarithmic Sobolev and Talagrand transport inequalities.