THE GAUSSIAN TRANSFORM (MonAmOR9)

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Abstract :

This paper introduces the general purpose Gaussian Transform, which aims at representing a generic symmetric distribution as an infinite mixture of Gaussian distributions. We start by the mathematical formulation of the problem and continue with the investigation of the conditions of existence of such a transform. Our analysis leads to the derivation of analytical and numerical tools for the computation of the Gaussian Transform, mainly based on the Laplace and Fourier transforms, as well as of the afferent properties set (e.g. the transform of sums of independent variables).Finally, the Gaussian Transform is exemplified in analytical form for typical distributions (e.g. Gaussian, Laplacian), and in numerical form for the Generalized Gaussian and Generalized Cauchy distributions families.

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