

A Generalisation of Pearson's Curve System and Explicit Representation of the Associated Density Function

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Abstract : A univariate density approximation technique whereby the derivative of the logarithm of a density function is assumed to be expressible as a rational function is introduced. This approach which extends Pearson's curve system is solely based on the moments of a distribution up to a determinable order. Upon solving a system of linear equations, the coefficients of the polynomial ratio can readily be identified. An explicit solution to the integral representation of the resulting density approximant is then obtained. It will be explained that when utilised in conjunction with sample moments, this methodology lends itself to the modelling of 'big data'. Applications to sets of univariate and bivariate observations will be presented.

Keywords : density estimation, log-density, moments, Pearson's curve system

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