# Gaussian pdf function



FigPDF of the standard normal random variable. The Gaussian distribution belongs to the family of stable distributions which are the attractors of sums of independent, identically distributed distributions whether or not the mean or variance is finite. If X is a normal variable we write X ˘ N„ ;˙ ”. The normal is important for many reasons: it is generated from the summation of independent random variables and as a result it occurs often in nature The product of two Gaussian probability density functions (PDFs), though, is not in general a Gaussian PDF. Taking the Fourier transform (unitary, angular-frequency convention) of a Gaussian function with parameters a = 1, b =and c yields another Gaussian function, with parameters, b =and / Standard Gaussian PDF Definition A standard Gaussian (or standard Normal) random variable X has a PDF f X(x) =√ 2π e−x(4) That is, X ∼N(0,1) is a Gaussian with μ=and σ2 =Figure:Definition of the CDF of the standard Gaussian Φ(x)/22 If X is a normal variable we There is no closed form for the integral of the Normal PDF, however since a linear transform of a Normal produces another Normal we can always map our distribution to the Figure shows the PDF of the standard normal random variable. Except for the Gaussian which is a limiting case, all stable distributions have heavy tails and infinite variance. The parameter is the mean or expectation of the distribution (and also its median and mode), while the parameter is its standard deviation However, we can solve for probabilities numerically using a function Φ:!=Φ −& ’Cannot be solved analytically ⚠ CDF of &~($,%# A function that has been solved for numerically To get here, we’ll first need to know some properties of Normal RVs The single most important random variable type is the Normal (aka Gaussian) random variable, parameterized by a mean () and variance (˙ 2). ’ σ. Let us find the mean and variance of the standard The Normal or Gaussian pdf () is a bell-shaped curve that is symmetric about the mean μ and that attains its maximum value of√πσ. The general form of its probability density function is. at x = μ as represented in In statistics, a normal distribution or Gaussian distribution is a type of continuous probability distribution for a real-valued random variable. See more The single most important random variable type is the Normal (aka Gaussian) random variable, parameterized by a mean () and variance (˙ 2).

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## Étape 1 -