

Normal Distribution

The formula for a normal distribution of x around a mean, μ , with standard deviation, σ , is

$$f(x, \mu, \sigma) = \frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sigma\sqrt{2\pi}}$$

The standard normal curve has $\mu=0$ and $\sigma=1$. The area under the curve between any two values can be calculated. In statistics, think about probabilities related to the normal curve. Given the variability around the center (the mean, or point estimate of the parameter), you can think about the probability of sampling a value within some distance, $z\sigma$, from the mean. It's the area under the normal probability density curve in an area ranging from $-z\sigma$ to $z\sigma$.