

## MULTIVARIATE NORMAL ENTROPY

Why

## Result

**Proposition 1.** Let  $x: \Omega \to \mathbb{R}^d$  be a normally distributed random variable on a probability space  $(\Omega, \mathcal{A}, \mathbb{P})$  with mean  $\mu \in \mathbb{R}^d$  and covariance  $\Sigma \succ 0$ . Let  $g: \mathbb{R}^d \to \mathbb{R}$  be the density of x. Then the entropy of x is

$$h(g) = -\int g \log g = \frac{1}{2} \log((2\pi e)^d \det \Sigma)$$

This result tells us the  $multivariate\ normal\ entropy$  or  $Gaussian\ entropy.$ 

