



Variance

1 Why

TODO

2 Definition

The **variance** of a square-integrable real-valued random variable is the expectation of its square less its expectation squared.

2.1 Notation

Let (X, \mathcal{A}, μ) be a probability space and f be a random variable. We denote the variance of f by **var** f . We defined it by

$$\mathbf{var} f = \mathbf{E}(f^2) - (\mathbf{E}(f))^2.$$

3 Result

Proposition 1. *The variance of a square-integrable real-valued random variable is the expectation of the square of the difference between the random variable and its expectation.*

Proof.

$$\mathbf{var} f = \mathbf{E}((f - \mathbf{E}(f))^2)$$

□