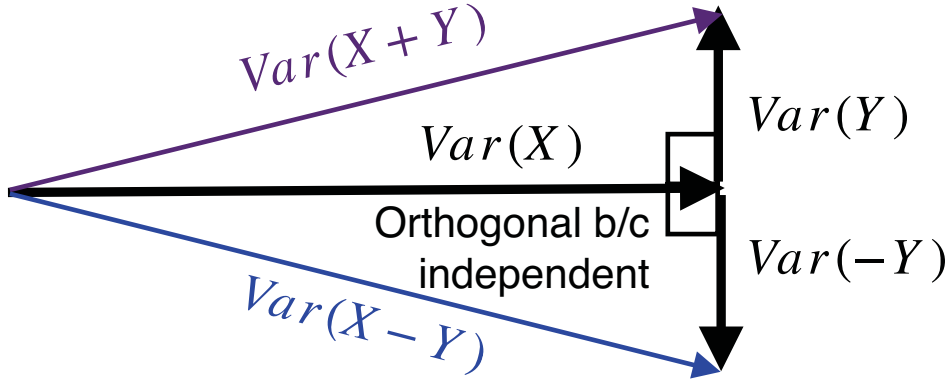
The **Variance of a Sum** of two **independent** random variables **is the Sum of the Variances**:

$$Var(X+Y) = Var(X) + Var(Y) = \sigma_1^2 + \sigma_2^2$$

Vector Perspective:



The **Variance of a Difference** of two **independent** random variables is **also the Sum of the Variances:**

$$Var(X-Y) = Var(X+(-Y))$$

$$= Var(X) + Var(-Y) = \sigma_1^2 + \sigma_2^2$$