25.03.18

$A \triangleq Var[X] \in \mathbb{R}^{p \times p}$, where $A_{ij} = Cov(X_i, X_j)$

$X \in \mathbb{R}^p$ $\qquad = E(X_i - \mu_i)(X_j - \mu_j)$

$\mu_i \triangleq E(X_i)$

$\|v\|_A^2 \triangleq v^T A v \geq 0$, for $v \in \mathbb{R}^p$

"=" holds iff $v = \vec{0}$

For the linear DGP run regression:

$$Y_i \sim \hat{\alpha} + W_i \hat{\tau} + X_i' \hat{\beta} + W_i X_i' \hat{\gamma}$$

$\hat{\tau}_{IREG} = \hat{\tau} + \bar{X} \cdot \hat{\gamma}$ is the interacting regression estimator

$$Y_i(w) = \mu_{(w)}(X_i) + \varepsilon_{i(w)}(X_i)$$

$\mu_{(w)}$: may not be linear.

$\varepsilon_{i(w)}$: mean 0

Variance $\sigma_{(w)}^2(x)$, conditioned on $X_i = x$.