

$$A \in \mathbb{R}^{m \times n}, \quad B(\lambda) = (A^t A + \lambda I)^{-1} A^t, \quad A^\dagger = (A^t A)^{-1} A^t$$

$$B(\lambda) - A^\dagger = (A^t A + \lambda I)^{-1} A^t - (A^t A)^{-1} A^t =$$

$$= \left\| \left[(A^t A + \lambda I)^{-1} - (A^t A)^{-1} \right] A^t \right\|_2$$

$$A = U \Sigma V^t, \quad \left\| \left[(V \Sigma^2 V^t + \lambda I)^{-1} - (V \Sigma^2 V^t)^{-1} \right] V \Sigma U^t \right\| =$$

$$I = V V^t \rightarrow \left\| \left[(V (\Sigma^2 + I \lambda) V^t)^{-1} - (V \Sigma^2 V^t)^{-1} \right] V \Sigma U^t \right\|$$