Econometrics **June 26, 2023**

Topic 18: Eigenvalue and Spike Models

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Key points: .

Disclaimer: *The note is built on Prof. Jinchi Lv's lectures of the course at USC, DSO 607, High-Dimensional Statistics and Big Data Problems.*

18.1 Motivation

Consider a $n \times p$ matrix $\mathbf{X}$ with the covariance matrix $\mathbf{X}'\mathbf{X} \sim \mathbf{W}(n, \mathbf{\Sigma})$ where $\mathbf{W}$ denotes the Wishart distribution. Then $\mathbf{X}'\mathbf{X}$ can be decomposed as

$$\mathbf{S} = \mathbf{X}'\mathbf{X} = \mathbf{ULU}' = \sum l_j \mathbf{u}_j \mathbf{u}_j'$$

References