

Department of Decision Sciences

Statistics Seminar

## Kronecker PCA for spatio-temporal covariance analysis

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12:30pm Room 3-E4-SR03 Via Röntgen 1 Milano

### Abstract

Similar to standard principal component analysis (PCA), Kronecker PCA approximates a high dimensional sample covariance matrix as a small sum of matrices of simple form, called the principal components. However, unlike standard PCA, in Kronecker PCA each principal component is a matrix that can be expressed as a Kronecker product of two lower dimensional matrices. The number of Kronecker components of the decomposition, called the separation rank, plays a similar role as the algebraic rank in PCA. The components are obtained by computing the singular value decomposition (SVD) of a rectangular matrix that is derived from the sample covariance matrix. The talk will start by discussing Kronecker product estimation in the matrix variate normal model and in sparse versions of this model. It will then introduce Kronecker PCA along with associated high dimensional convergence rates. It will conclude with an illustration on spatio-temporal analysis of meteorological data and future perspectives.