Process Monitoring

by
Mohd Yusri Mohd Yunus
yusri@ump.edu.my

Chapter 3a
Principal Component Analysis

Process Monitoring

Questions from final exam paper of SemII 11-12:

1. Describe the basic concept of eigenvectors and eigenvalues respectively.

2. Explain on the objective characteristic that must be complied by **T** in order to develop **Z** in the following equation.

   Z = X$_d$T whereby, **Z**= PC scores, **X$_d$** =standardized data, **T**= eigenvectors

3. Suppose two sets of eigenvectors given by $\mathbf{Ta} = \begin{bmatrix} 0.707 & -0.707 \\ 0.707 & 0.707 \end{bmatrix}$ and $\mathbf{Tb} = \begin{bmatrix} 0.80 & -0.80 \\ 0.60 & 0.60 \end{bmatrix}$ are to be analyzed to transform a particular variance-covariance matrix $(\mathbf{X}_{da}) = \begin{bmatrix} 14.19 & 10.69 \\ 10.69 & 8.91 \end{bmatrix}$. Please justify which one of these transformation matrices that must be chosen in appropriately

Process Monitoring

Communitising Technology

References

- Green, P.E., and Carroll, J.D., (1976). *Mathematical Tools for Applied Multivariate Analysis.* New York, USA: Academic Press.

- Jackson, J.E., (1991). *A User's Guide To Principal Components.* John Wiley and Sons. USA.

Process Monitoring

Authors Information

Credit to the authors:

Process Monitoring