ETH
Swiss Federal Institute of Technology Zurich

Seminar for Statistics

Department of Mathematics

Bachelor Thesis placeholder

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Submission Date: placeholder

Adviser: placeholder

Abstract

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Chapter 1

Introduction to normal mixture models

here intro to normal mixtures

explain in scetch EM algo

explain idea to use parameter optimizer instead, EM has pathological insufficiencies, like 'getting stuck' for many iterations. we hope we need less iterations, and as concequence less time. 'special' idea: using cholesky decomp.

1.1 choice of notation

describe difference in notation between ceuleux & govaert and our covariance matrix decomposition.

make clear that the models can not be translated one to one to ldlt model

make nice table(maybe sideways to account for parameter list)

Model	$\boldsymbol{\Sigma}_k$ C&G	volume	shape	orientation
EII	$\alpha\boldsymbol{I}$	equal		
VII	$\alpha_k\boldsymbol{I}$	variable		
EEI	$\alpha\boldsymbol{\Lambda}$	equal		
VEI	$\alpha_k\boldsymbol{\Lambda}$	variable		
EVI	$\alpha\boldsymbol{\Lambda}_k$	equal		
VVI	$\alpha_k\boldsymbol{\Lambda}_k$	variable		
EEE	$\alpha\boldsymbol{Q}\boldsymbol{\Lambda}\boldsymbol{Q}^\top$	equal		
EVE	$\alpha\boldsymbol{Q}\boldsymbol{\Lambda}_k\boldsymbol{Q}^\top$	equal		
VEE	$\alpha_k\boldsymbol{Q}\boldsymbol{\Lambda}\boldsymbol{Q}^\top$	variable		
VVE	$\alpha_k\boldsymbol{Q}\boldsymbol{\Lambda}_k\boldsymbol{Q}^\top$	variable		
EEV	$\alpha\boldsymbol{Q}_k\boldsymbol{\Lambda}\boldsymbol{Q}_k^\top$	equal		
VEV	$\alpha_k\boldsymbol{Q}_k\boldsymbol{\Lambda}\boldsymbol{Q}_k^\top$	variable		
EVV	$\alpha\boldsymbol{Q}_k\boldsymbol{\Lambda}_k\boldsymbol{Q}_k^\top$	equal		
VVV	$\alpha_k\boldsymbol{Q}_k\boldsymbol{\Lambda}_k\boldsymbol{Q}_k^\top$	variable		

Chapter 2

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Bibliography

Bar, F. and H. Meier (2001). Title of the article. *Journal where the article has been published volume of the journal*, 12–77.

Hampel, F. R. (1985). The breakdown points of the mean combined with some rejection rules. *Technometrics 27*(2), 95–107.

Stahel, W. and S. Weisberg (1991). *Directions in Robust Statistics and Diagnostics, 2 vol.* N. Y.: Springer-Verlag.

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