

New!

Multivariate Bayesian Statistics

Models for Source Separation and Signal Unmixing

Daniel B. Rowe
Medical College of Wisconsin, USA

Bayesian approach solves “cocktail party” problems

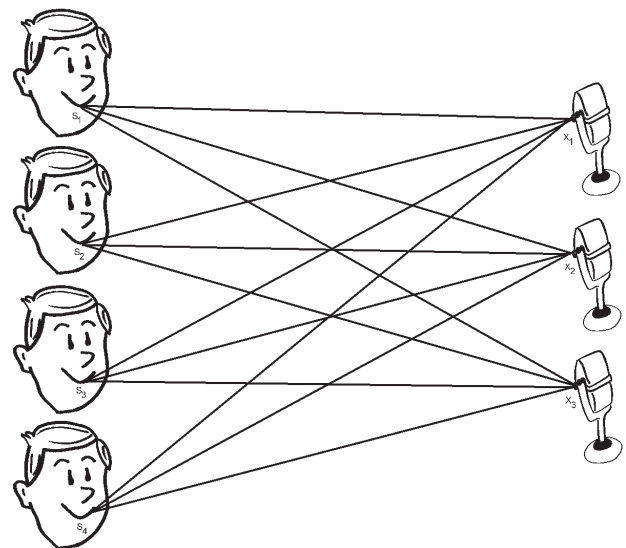
Of the two primary approaches to the classic source separation problem, only one does not impose potentially unreasonable model and likelihood constraints: the Bayesian statistical approach. Bayesian methods incorporate the available information regarding the model parameters and not only allow estimation of the sources and mixing coefficients, but also allow inferences to be drawn from them.

Multivariate Bayesian Statistics: Models for Source Separation and Signal Unmixing offers a thorough, self-contained treatment of the source separation problem. After an introduction to the problem using the “cocktail-party” analogy, *Part I* provides the statistical background needed for the Bayesian source separation model. *Part II* considers the instantaneous constant mixing models, where the observed vectors and unobserved sources are independent over time but allowed to be dependent within each vector. *Part III* details more general models in which sources can be delayed, mixing coefficients can change over time, and observation and source vectors can be correlated over time. For each model discussed, the author gives two distinct ways to estimate the parameters.

Real-world source separation problems, encountered in disciplines from engineering and computer science to economics and image processing, are more difficult than they appear. This book furnishes the fundamental statistical material and up-to-date research results that enable readers to understand and apply Bayesian methods to help solve the many “cocktail party” problems they may confront in practice.

FEATURES

- Offers the first Bayesian approach to the source separation problem
- Provides all of the mathematical and statistical background needed, from statistical distributions and introductory Bayesian probability to prior hyperparameter assessment and estimation methods
- Covers the multivariate regression model, the factor analysis model, the Bayesian Source Separation model, the unobservable and observable source separation model, the delayed source separation model, the dynamic mixing coefficient models, and the correlation model, all discussed from the Bayesian perspective



The mixing process.

See reverse side for contents

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Multivariate Bayesian Statistics: Models for Source Separation and Signal Unmixing - Contents

Introduction

Part I: FUNDAMENTALS

STATISTICAL DISTRIBUTIONS

Scalar Distributions
Vector Distributions
Matrix Distributions

INTRODUCTORY BAYESIAN STATISTICS

Discrete Scalar Variables
Continuous Scalar Variables
Continuous Vector Variables
Continuous Matrix Variables

PRIOR DISTRIBUTIONS

Vague Priors
Conjugate Priors
Generalized Priors
Correlation Priors

HYPERPARAMETER ASSESSMENT

Introduction
Binomial Likelihood
Scalar Normal Likelihood
Multivariate Normal Likelihood
Matrix Normal Likelihood

BAYESIAN ESTIMATION METHODS

Marginal Posterior Mean
Maximum a Posteriori
Advantages of ICM over Gibbs Sampling
Advantages of Gibbs Sampling over ICM

REGRESSION

Introduction
Normal Samples

Simple Linear Regression
Multiple Linear Regression
Multivariate Linear Regression

Part II: II Models

BAYESIAN REGRESSION

Introduction
The Bayesian Regression Model
Likelihood

Conjugate Priors and Posterior
Conjugate Estimation and Inference
Generalized Priors and Posterior
Generalized Estimation and Inference
Interpretation
Discussion

BAYESIAN FACTOR ANALYSIS

Introduction
The Bayesian Factor Analysis Model
Likelihood

Conjugate Priors and Posterior
Conjugate Estimation and Inference
Generalized Priors and Posterior
Generalized Estimation and Inference
Interpretation
Discussion

BAYESIAN SOURCE SEPARATION

Introduction
Source Separation Model
Source Separation Likelihood
Conjugate Priors and Posterior

Conjugate Estimation and Inference
Generalized Priors and Posterior
Generalized Estimation and Inference
Interpretation
Discussion

UNOBSERVABLE AND OBSERVABLE SOURCE SEPARATION

Introduction
Model
Likelihood
Conjugate Priors and Posterior
Conjugate Estimation and Inference
Generalized Priors and Posterior
Generalized Estimation and Inference
Interpretation
Discussion

FMRI CASE STUDY

Introduction
Model
Priors and Posterior
Estimation and Inference
Simulated FMRI Experiment
Real FMRI Experiment
FMRI Conclusion

Part III: Generalizations

DELAYED SOURCES AND DYNAMIC COEFFICIENTS

Introduction
Model
Delayed Constant Mixing

Delayed Nonconstant Mixing
Instantaneous Nonconstant Mixing
Likelihood
Conjugate Priors and Posterior
Conjugate Estimation and Inference
Generalized Priors and Posterior
Generalized Estimation and Inference
Interpretation
Discussion

CORRELATED OBSERVATION AND SOURCE VECTORS

Introduction
Model
Likelihood
Conjugate Priors and Posterior
Conjugate Estimation and Inference
Posterior Conditionals
Generalized Priors and Posterior
Generalized Estimation and Inference
Interpretation
Discussion

CONCLUSION

Appendix A: FMRI Activation Determination
Appendix B: FMRI Hyperparameter Assessment
Bibliography
Index

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