
Contents

Preface	ix
Notation	xi
Introduction	1
Part I. SSA: Methodology	13
1 Basic SSA	15
1.1 Basic SSA: description	16
1.2 Steps in Basic SSA: comments	18
1.3 Basic SSA: basic capabilities	24
1.4 Time series and SSA tasks	32
1.5 Separability	44
1.6 Choice of SSA parameters	53
1.7 Supplementary SSA techniques	78
2 SSA forecasting	93
2.1 SSA recurrent forecasting algorithm	95
2.2 Continuation and approximate continuation	96
2.3 Modifications to Basic SSA R-forecasting	107
2.4 Forecast confidence bounds	115
2.5 Summary and recommendations	127
2.6 Examples and effects	131
3 SSA detection of structural changes	149
3.1 Main definitions and concepts	149
3.2 Homogeneity and heterogeneity	156
3.3 Heterogeneity and separability	169
3.4 Choice of detection parameters	189
3.5 Additional detection characteristics	196
3.6 Examples	204

	CONTENTS
Part II. SSA: Theory	217
4 Singular value decomposition	219
4.1 Existence and uniqueness	219
4.2 SVD matrices	222
4.3 Optimality of SVDs	227
4.4 Centring in SVD	232
5 Time series of finite rank	237
5.1 General properties	237
5.2 Series of finite rank and recurrent formulae	243
5.3 Time series continuation	252
6 SVD of trajectory matrices	257
6.1 Mathematics of separability	257
6.2 Hankelization	266
6.3 Centring in SSA	268
6.4 SSA for stationary series	276
List of data sets and their sources	297
References	299
Index	303