Raw Data

This document contains the raw data that were created by the pink hat segmentation algorithm. The raw data for the fifteen data sets used are shown. The blue and red indicate the x and y co-ordinates of the person being tracked.
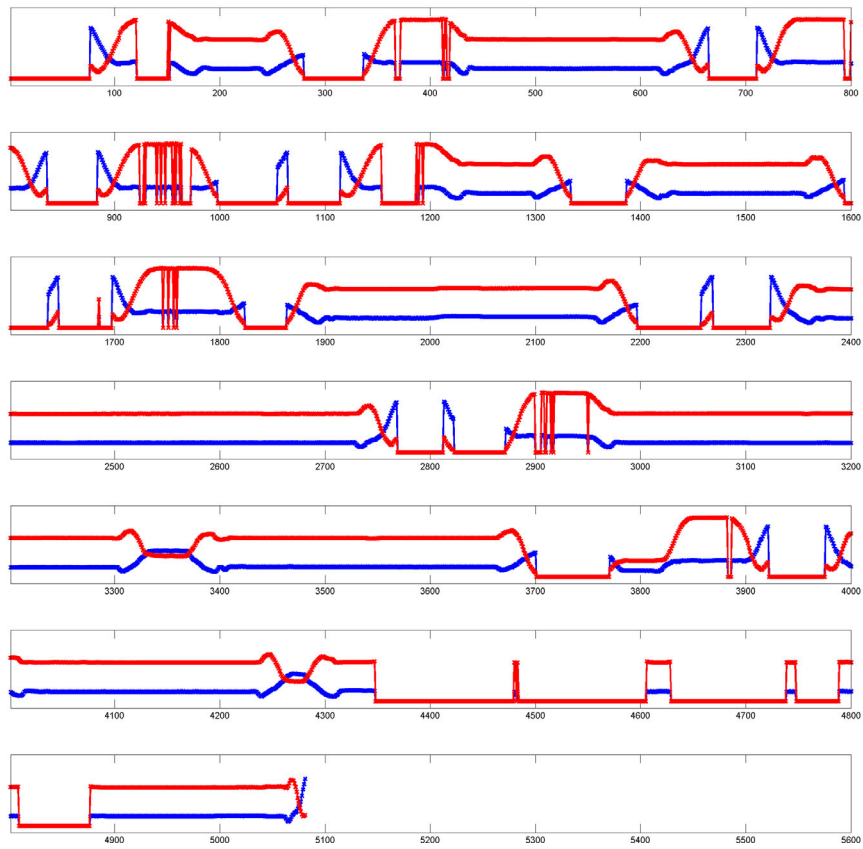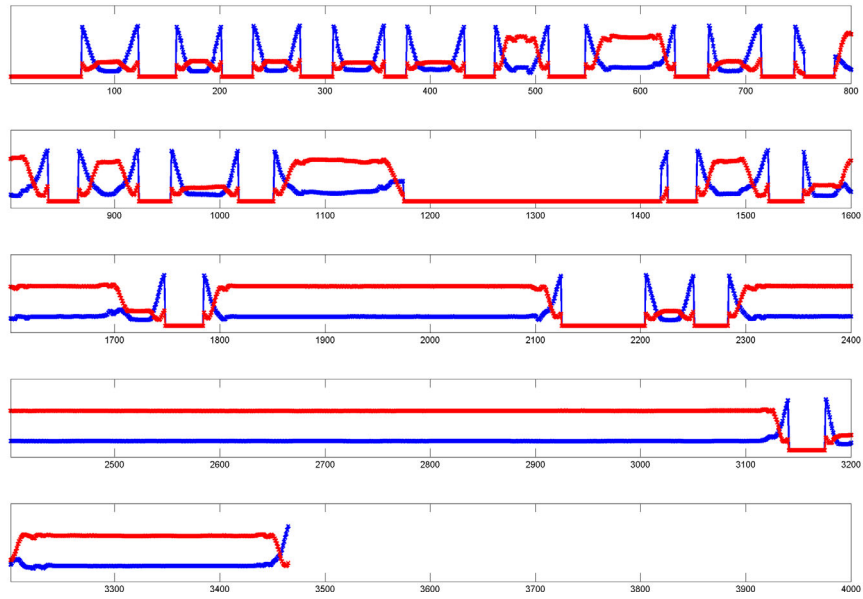
Figure 1: Raw data from DATA SET 1

2

Figure 2: Raw data from DATA SET 2

Figure 3: Raw data from DATA SET 3

3

Figure 4: Raw data from DATA SET 4
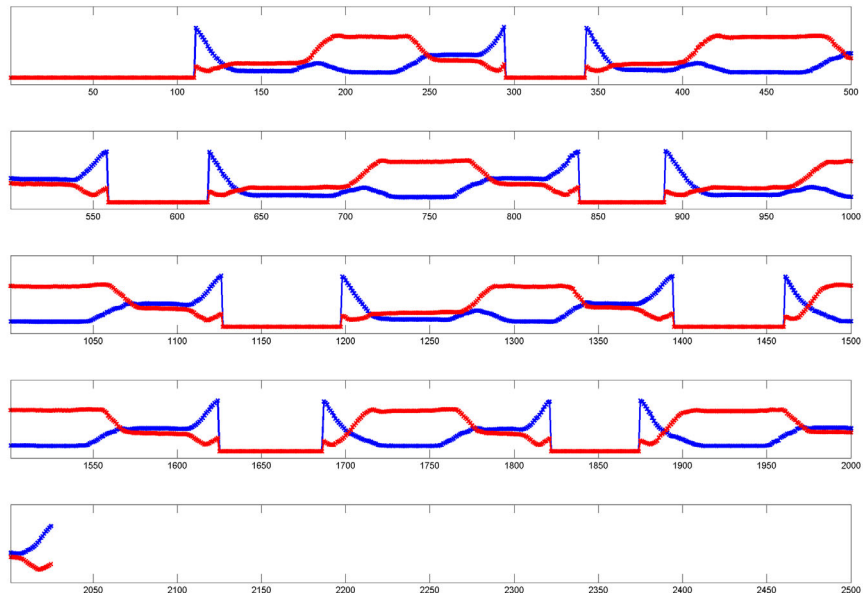
Figure 5: Raw data from DATA SET 5

4
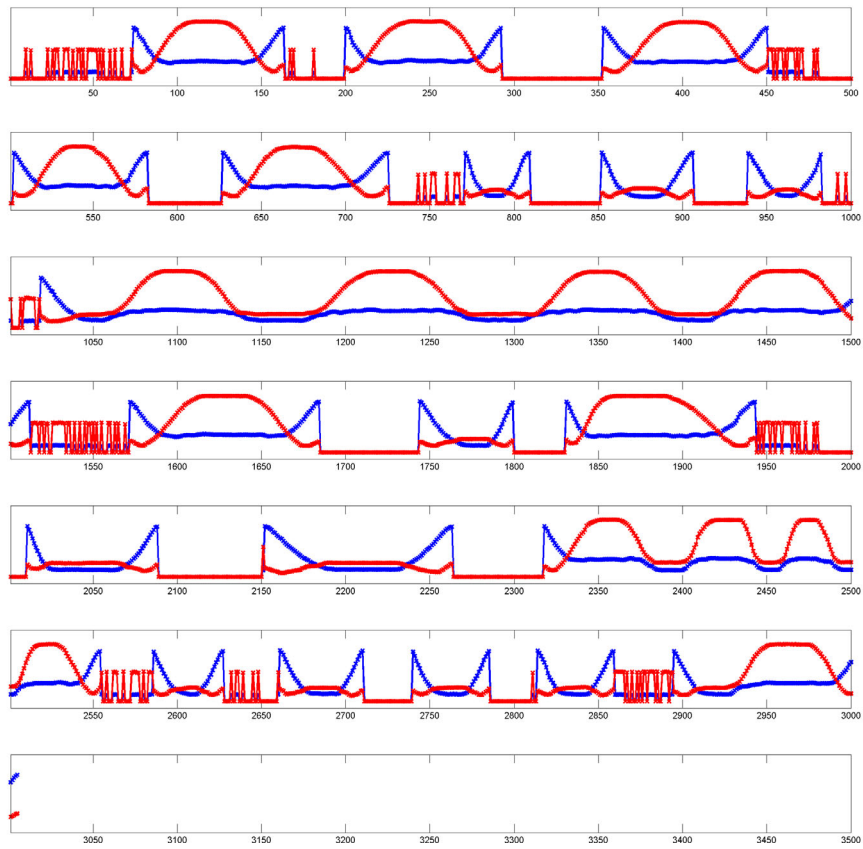
Figure 6: Raw data from DATA SET 6
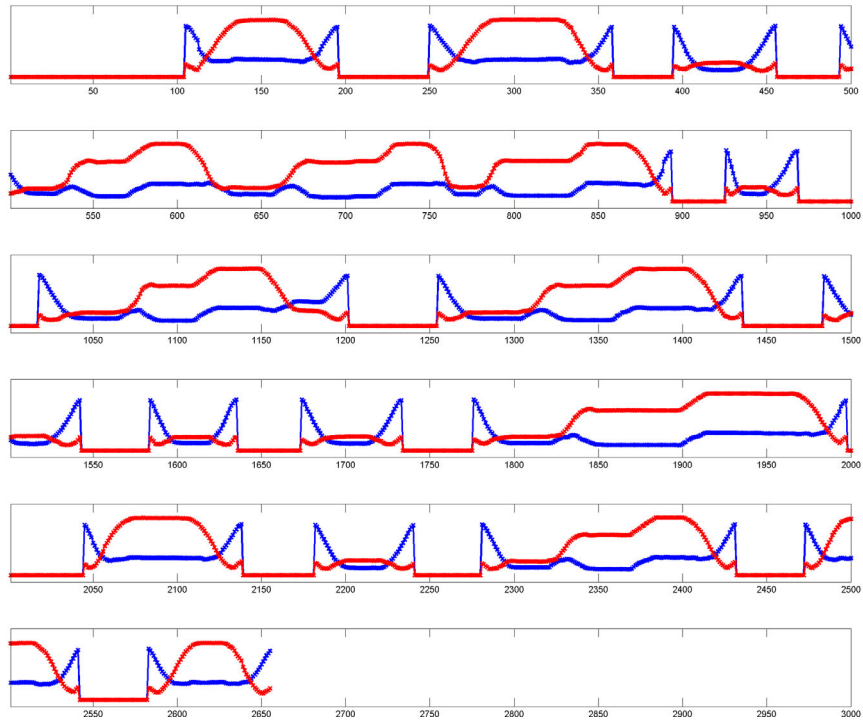
Figure 7: Raw data from DATA SET 7
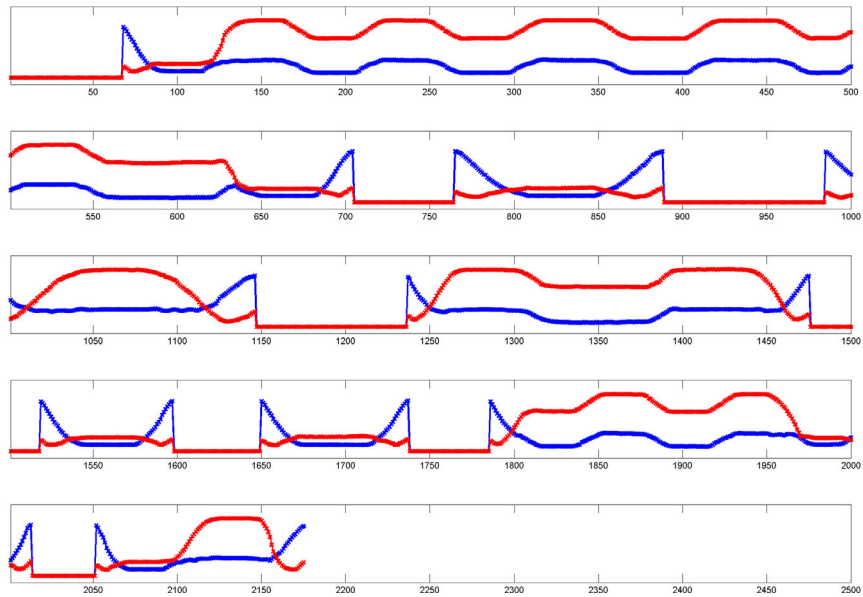
Figure 8: Raw data from DATA SET 8

6
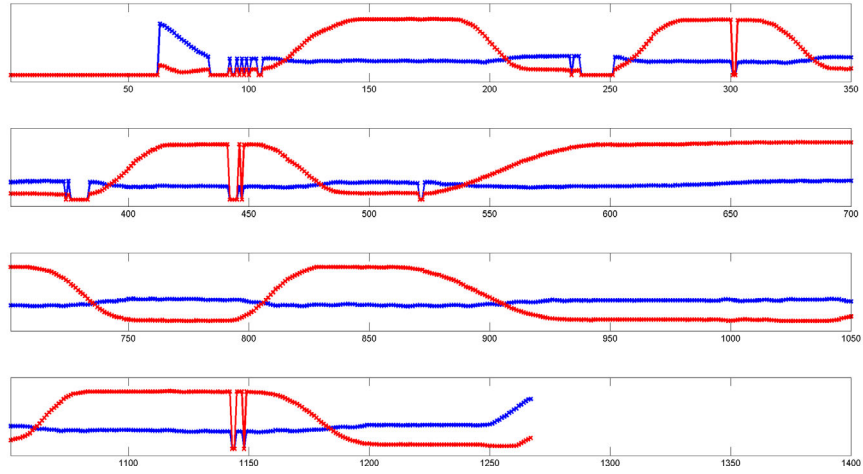
Figure 9: Raw data from DATA SET 9
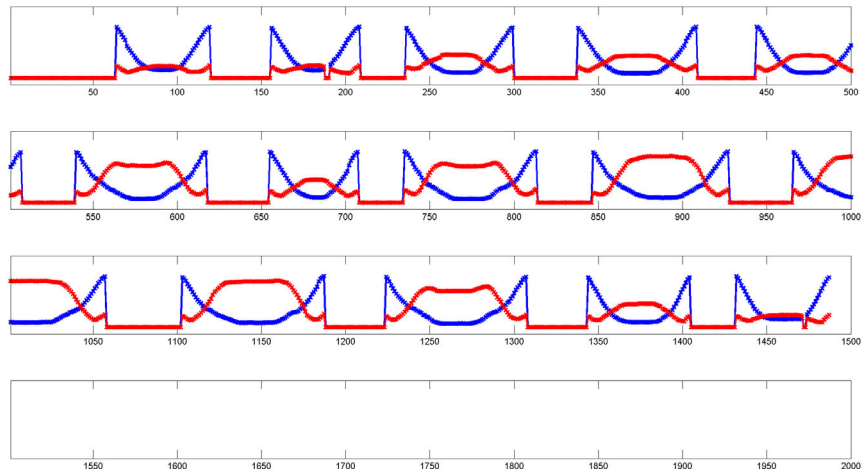
Figure 10: Raw data from DATA SET 10
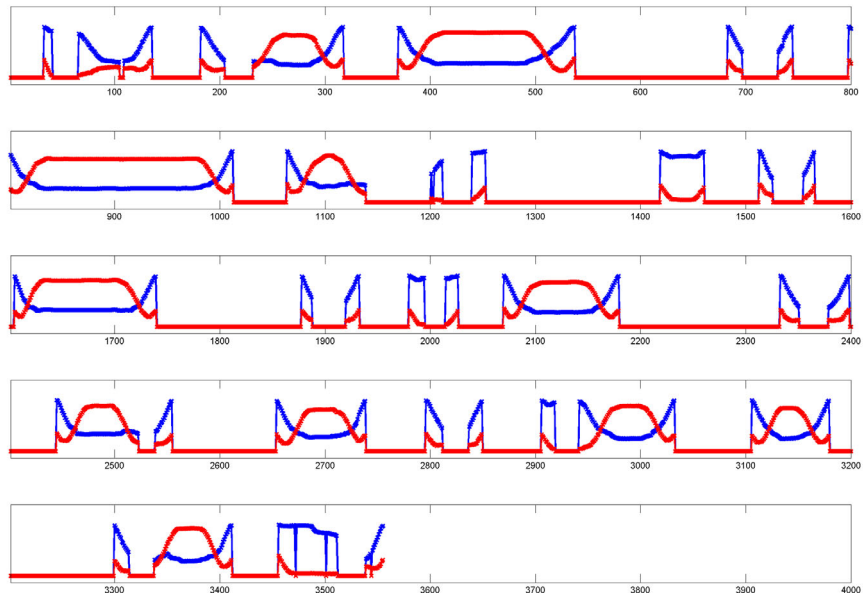
Figure 11: Raw data from DATA SET 11

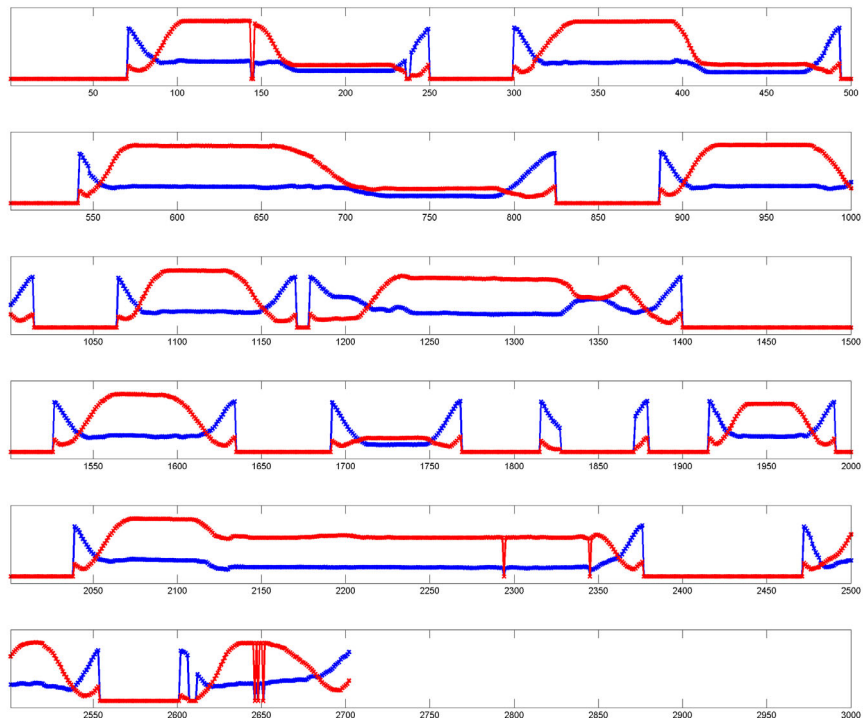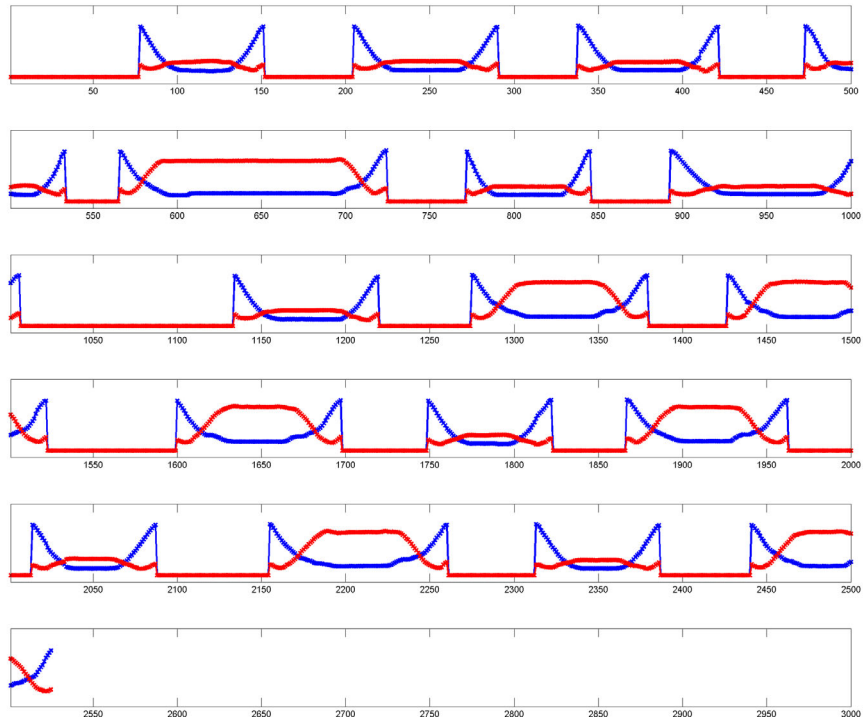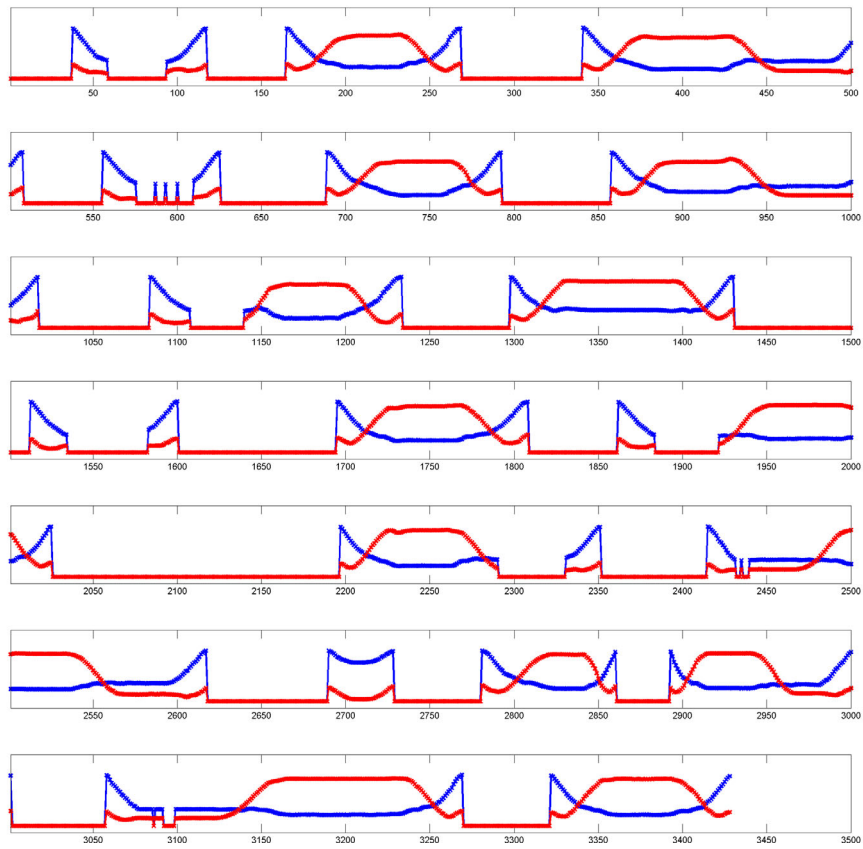Figure 12: Raw data from DATA SET 12

9
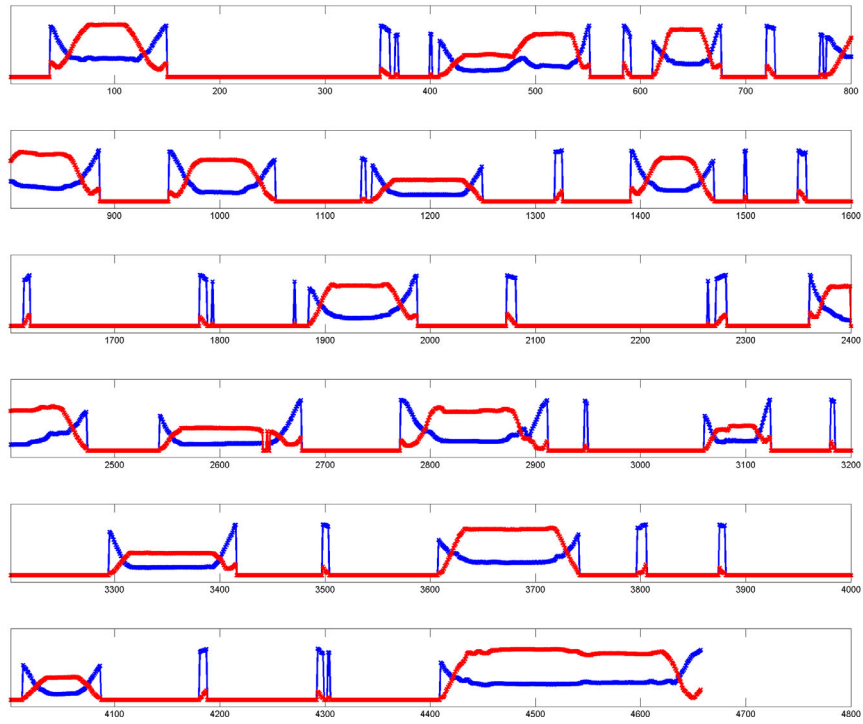
Figure 13: Raw data from DATA SET 13
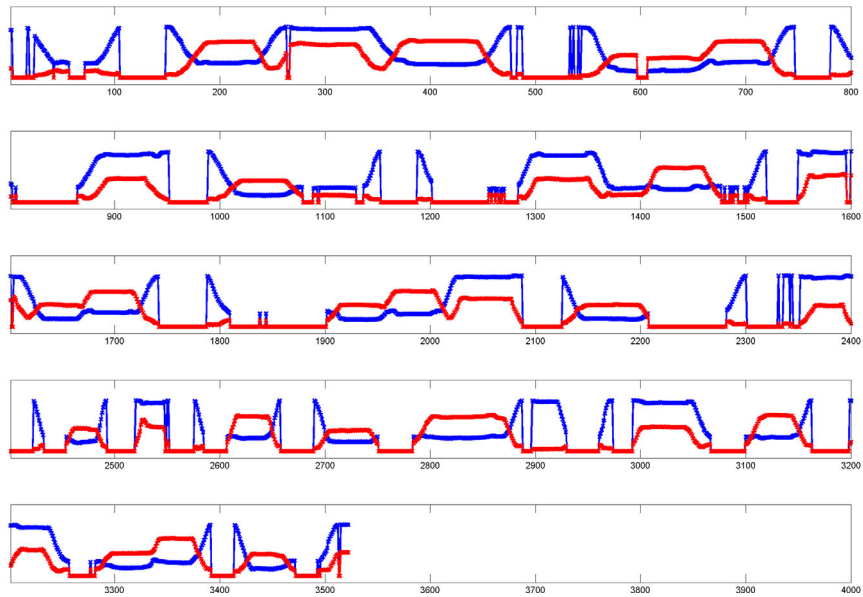
Figure 14: Raw data from DATA SET 14
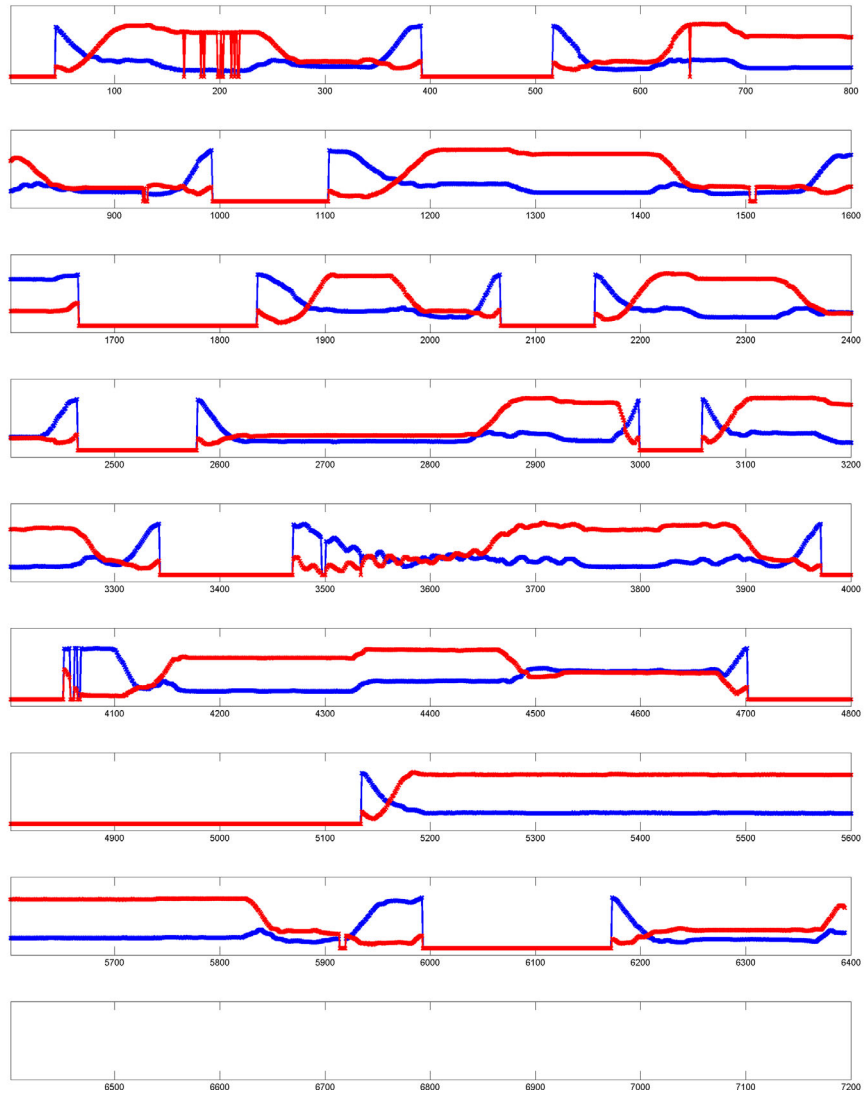
Figure 15: Raw data from DATA SET 15

Individual Movements

This document contains the output from the pre-processing stage and the movement detection algorithm. The data for the fifteen data sets used are shown. The blue and red indicate the x and y co-ordinates of the person being tracked. The black areas indicate the individual movements made.
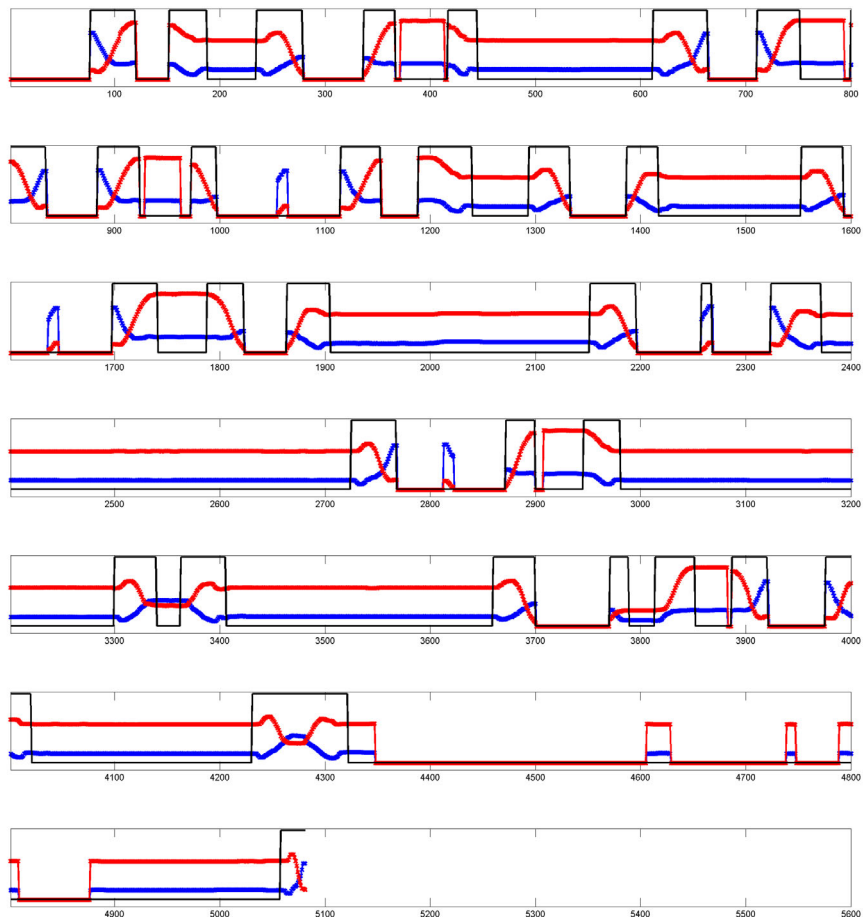
Figure 1: Segmented data from DATA SET 1 after pre-processing

2
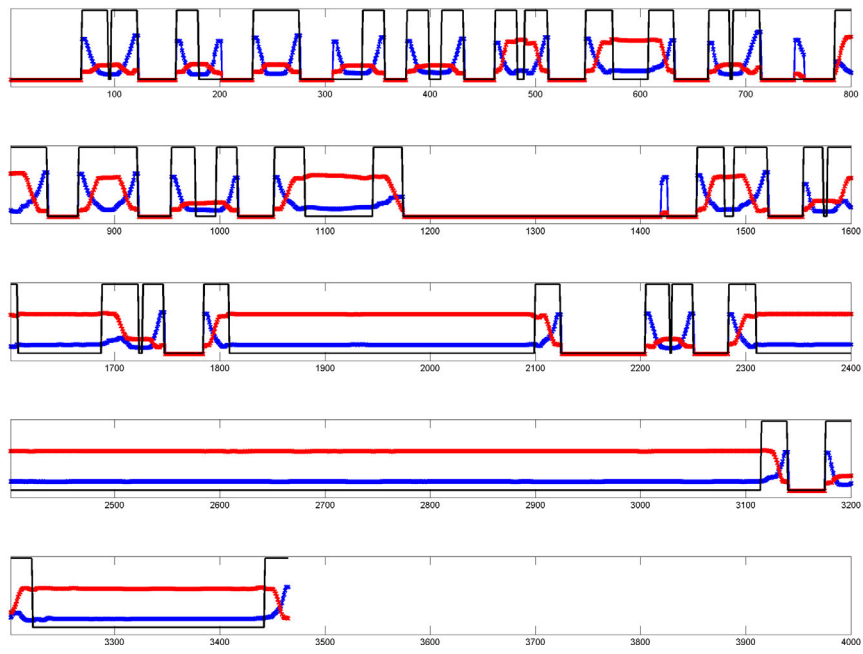
Figure 2: Segmented data from DATA SET 2 after pre-processing

3
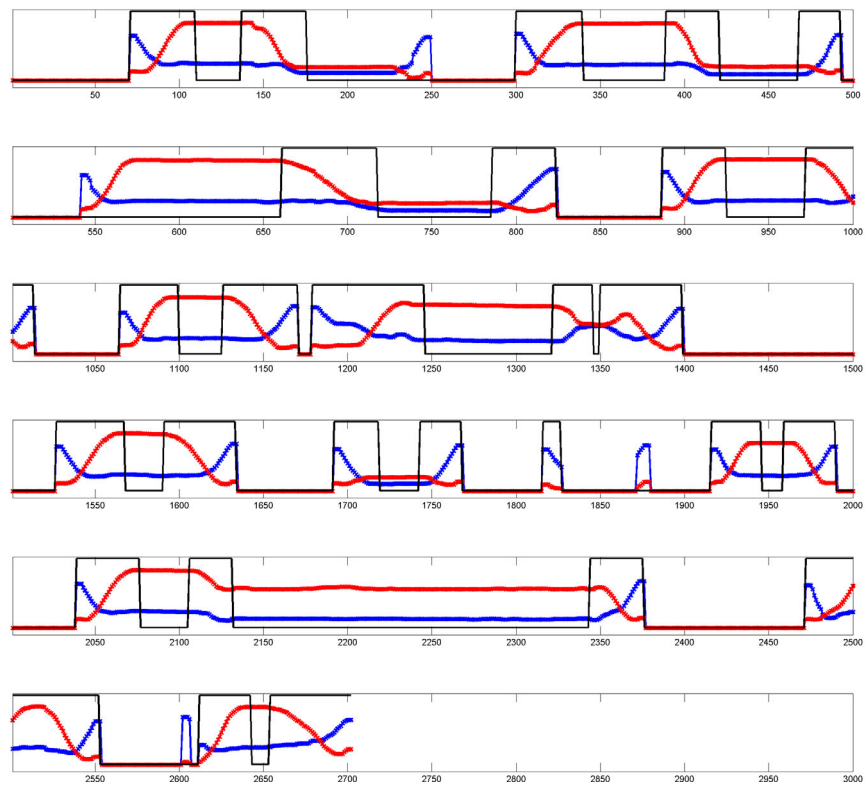
Figure 3: Segmented data from DATA SET 3 after pre-processing

4
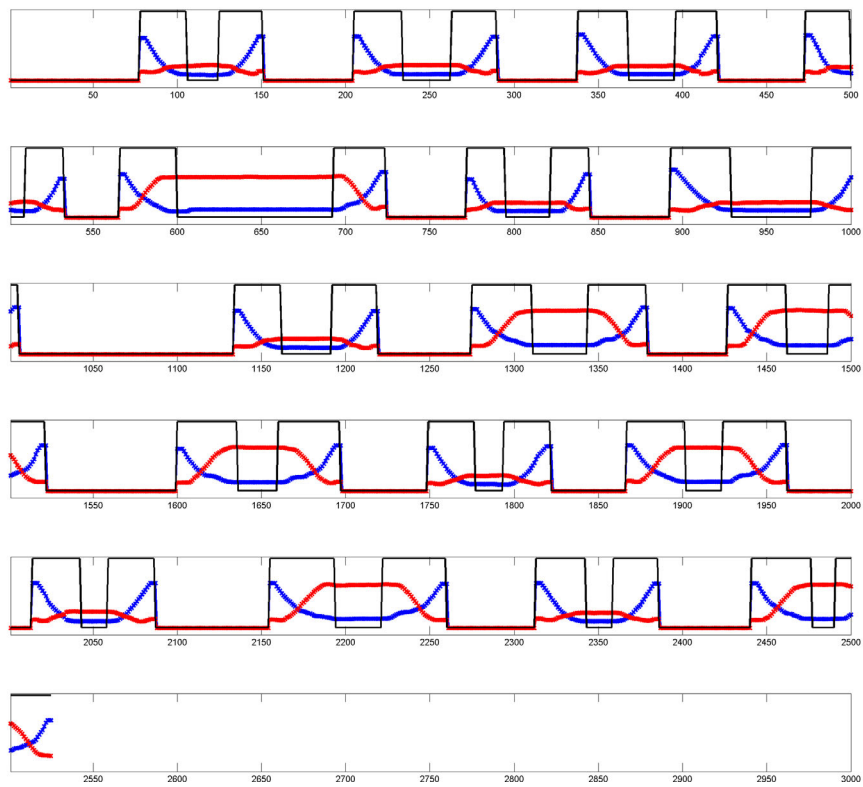
Figure 4: Segmented data from DATA SET 4 after pre-processing

5
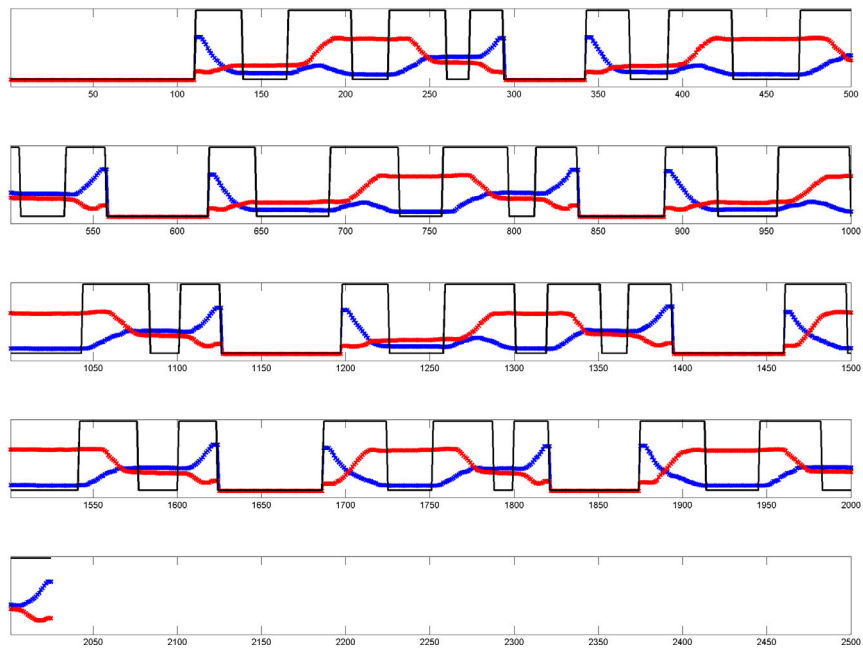
Figure 5: Segmented data from DATA SET 5 after pre-processing

6
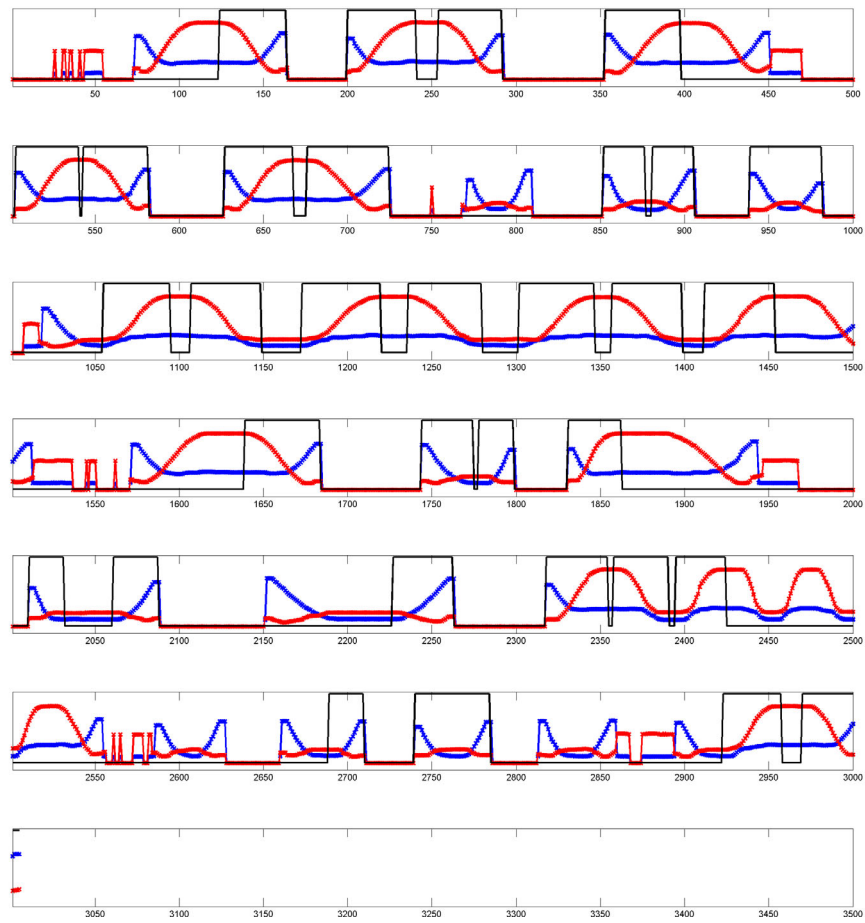
Figure 6: Segmented data from DATA SET 6 after pre-processing
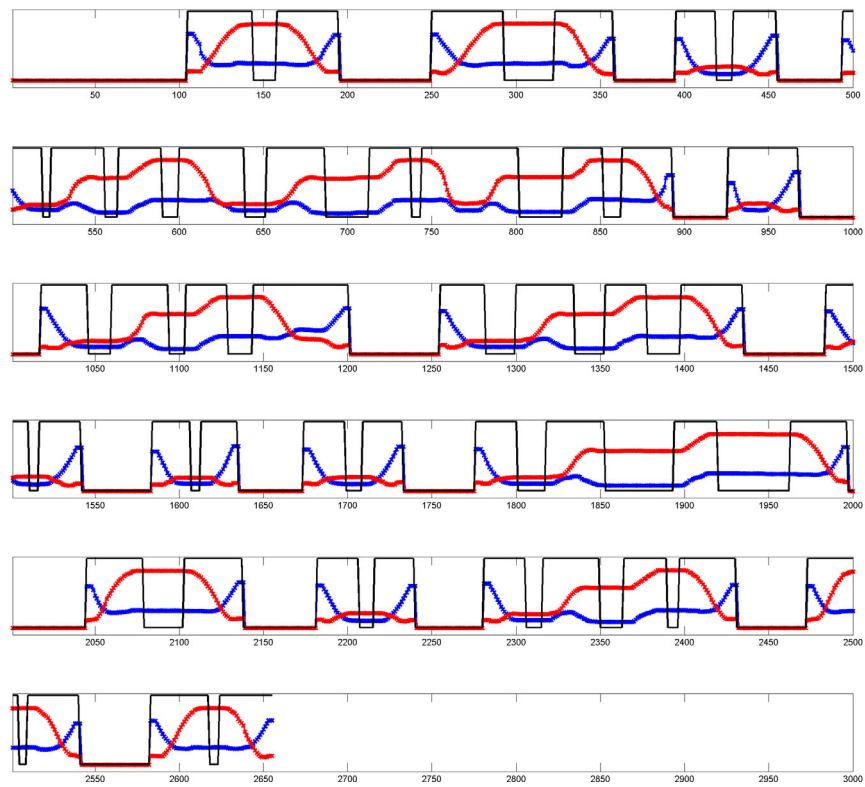
Figure 7: Segmented data from DATA SET 7 after pre-processing

8
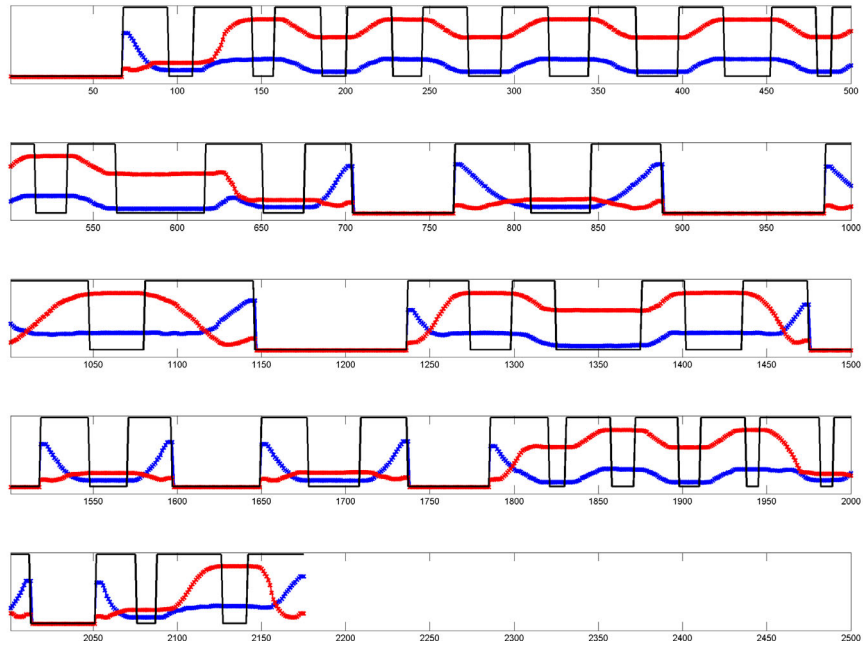
Figure 8: Segmented data from DATA SET 8 after pre-processing
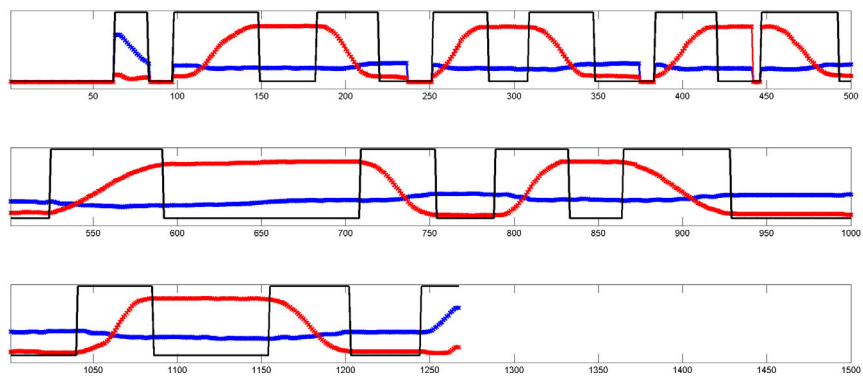
Figure 9: Segmented data from DATA SET 9 after pre-processing

9
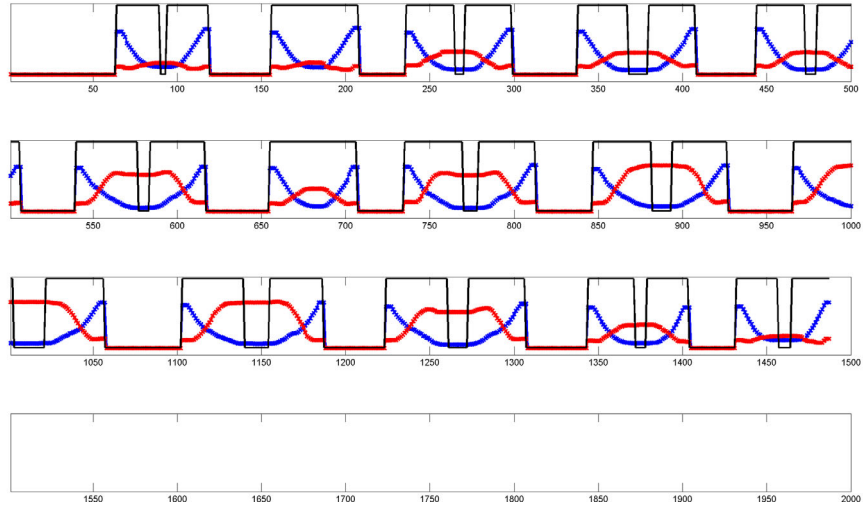
Figure 10: Segmented data from DATA SET 10 after pre-processing
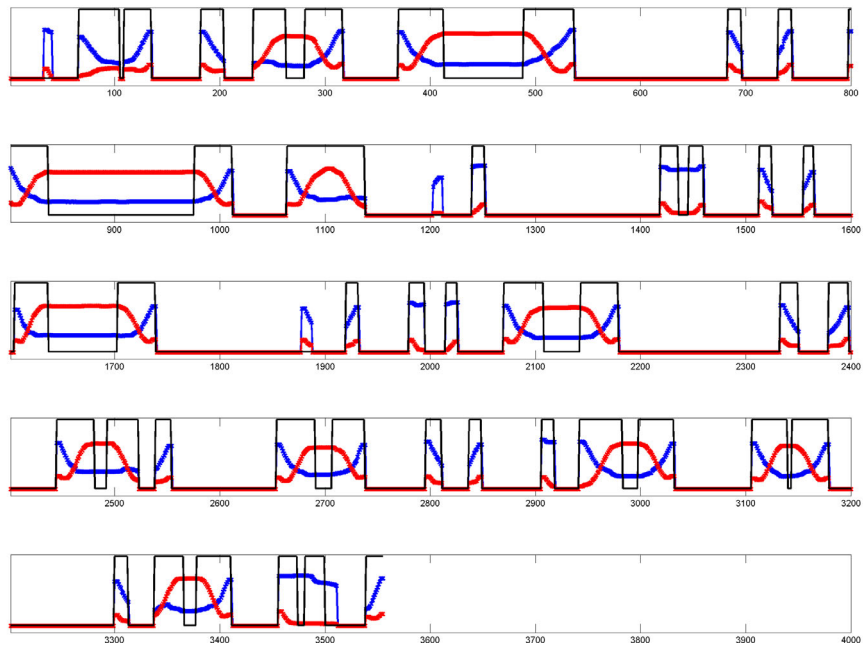
Figure 11: Segmented data from DATA SET 11 after pre-processing

10
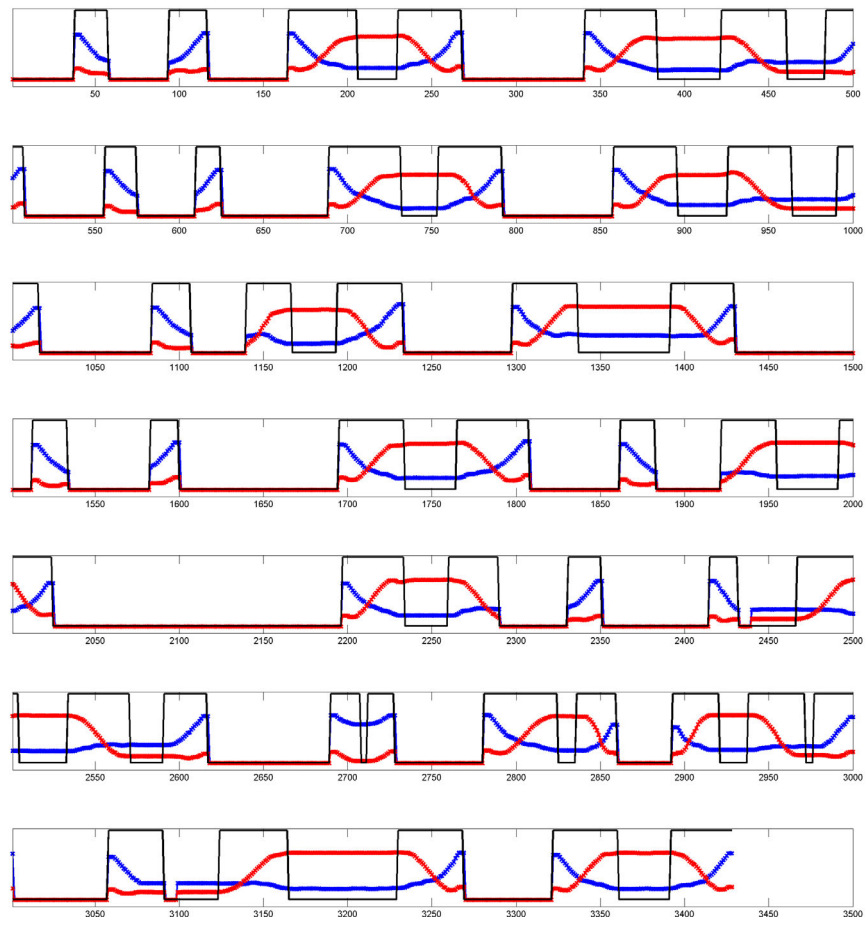
Figure 12: Segmented data from DATA SET 12 after pre-processing
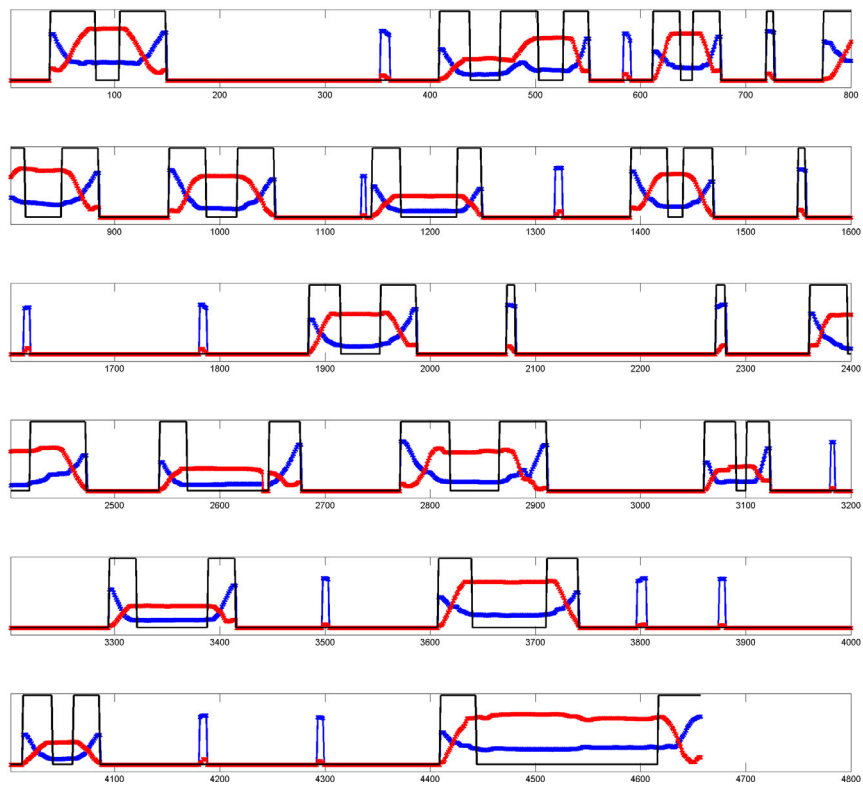
Figure 13: Segmented data from DATA SET 13 after pre-processing

12
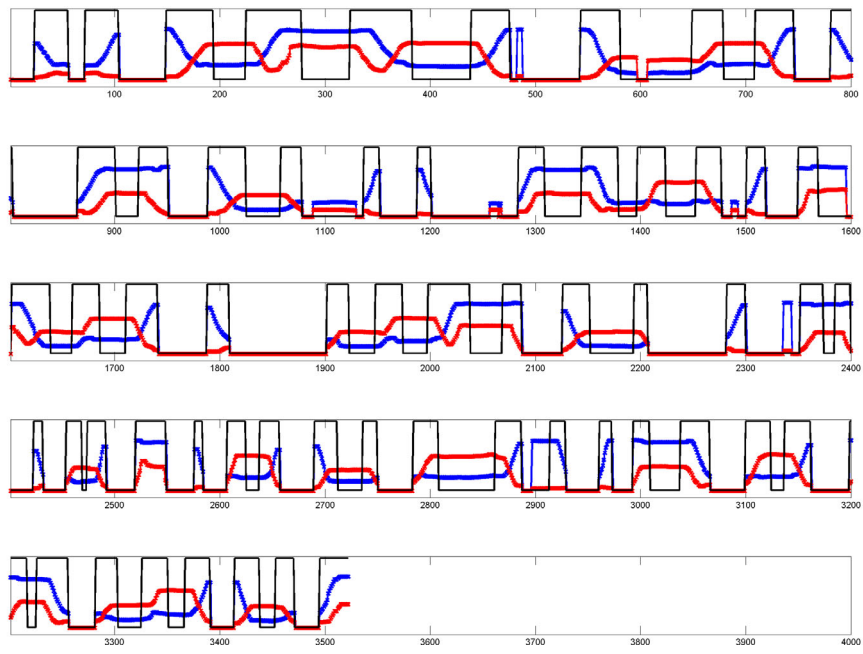
Figure 14: Segmented data from DATA SET 14 after pre-processing

13
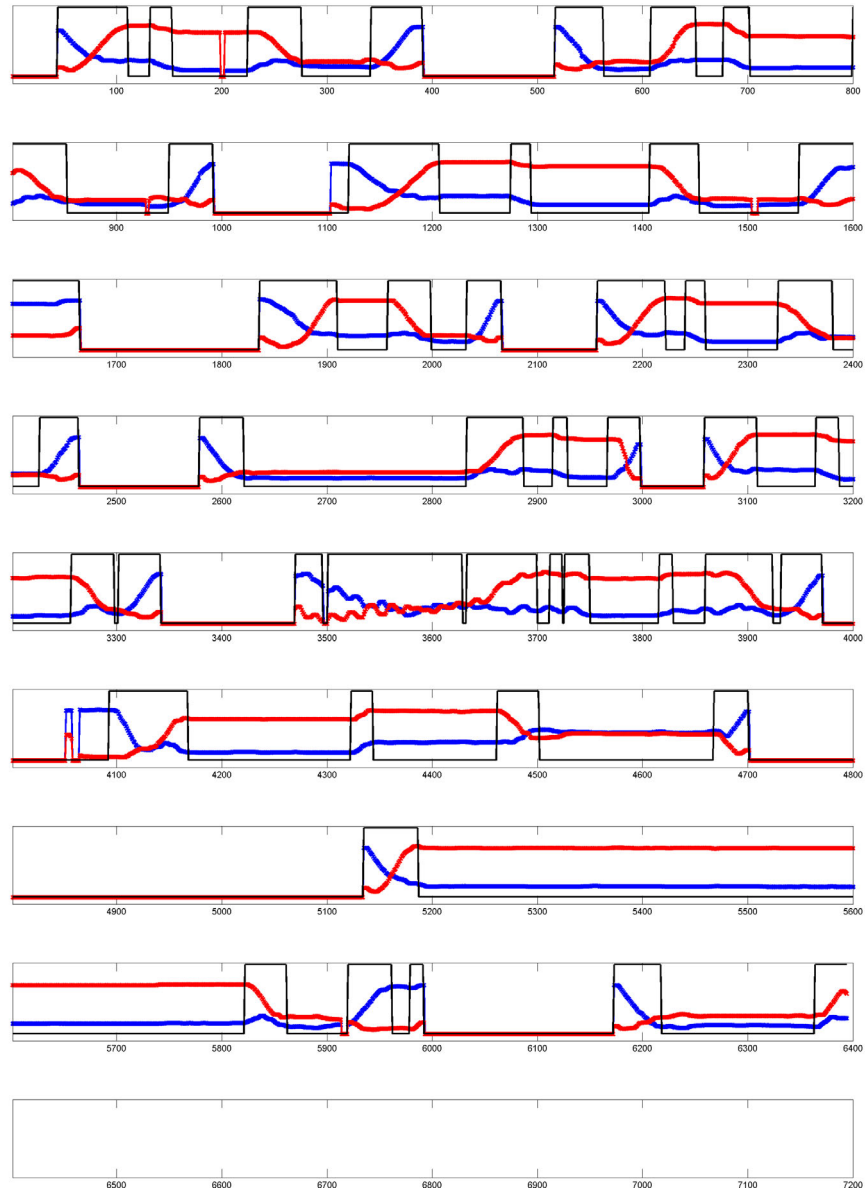
Figure 15: Segmented data from DATA SET 15 after pre-processing

14

Clustering

This document contains the various outputs from the clustering techniques used on the fifteen data sets. The benchmark data set is also present.
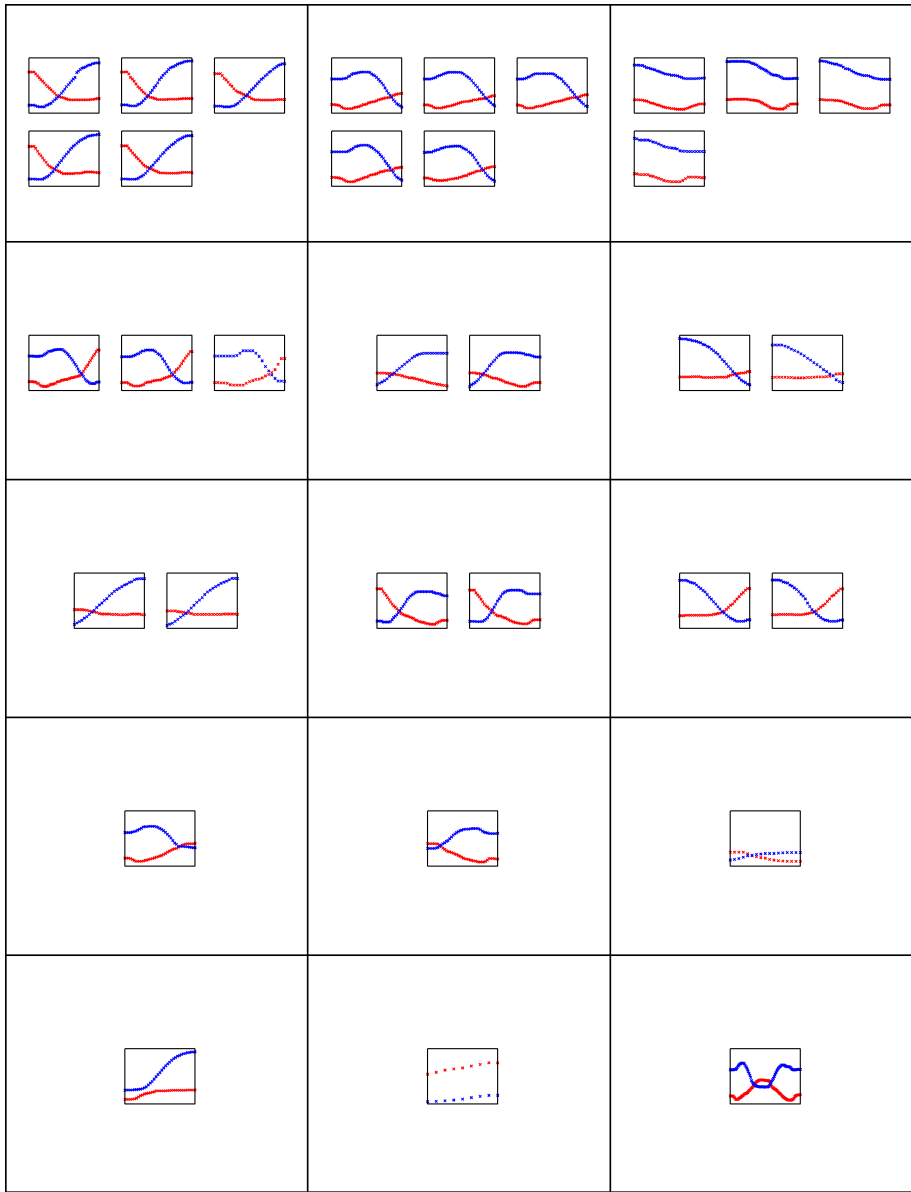
Figure 1: Benchmark: movement clusters from DATA SET 1
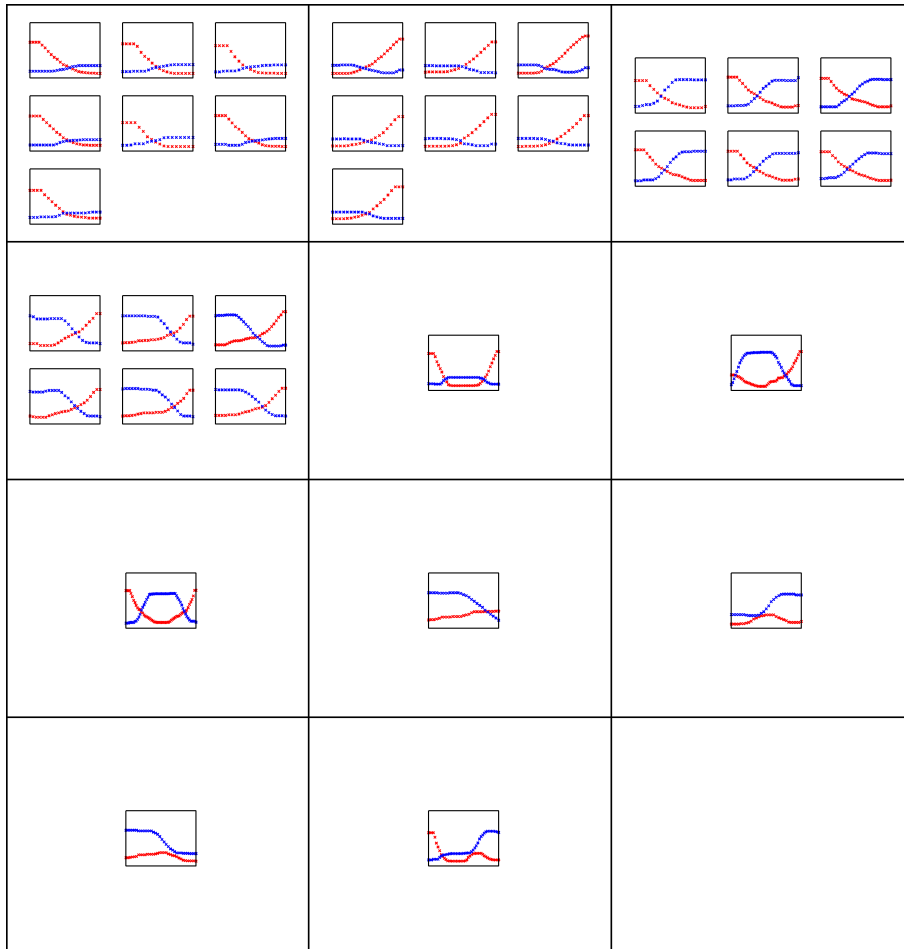
Figure 2: Benchmark: movement clusters from DATA SET 2
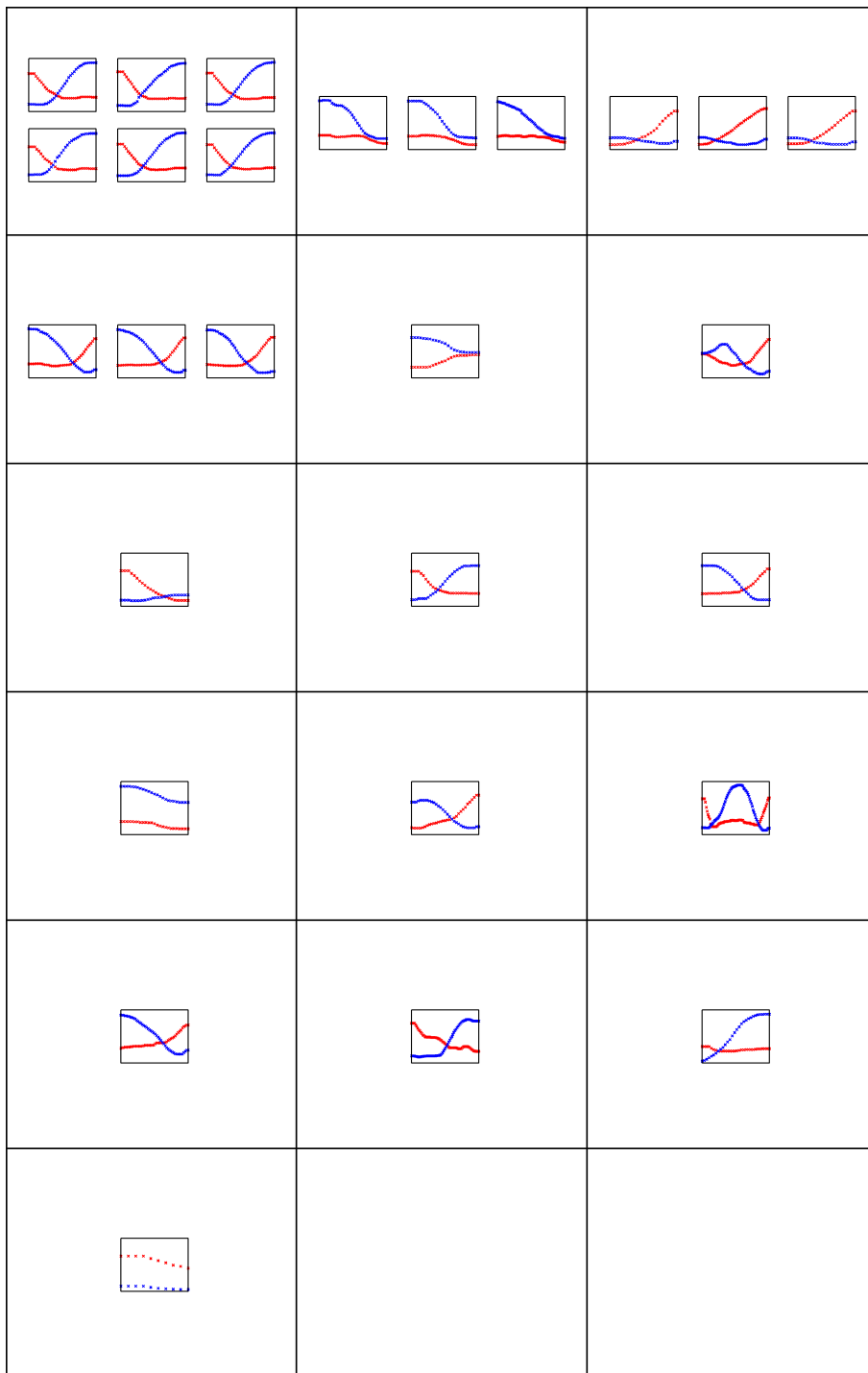
Figure 3: Benchmark: movement clusters from DATA SET 3
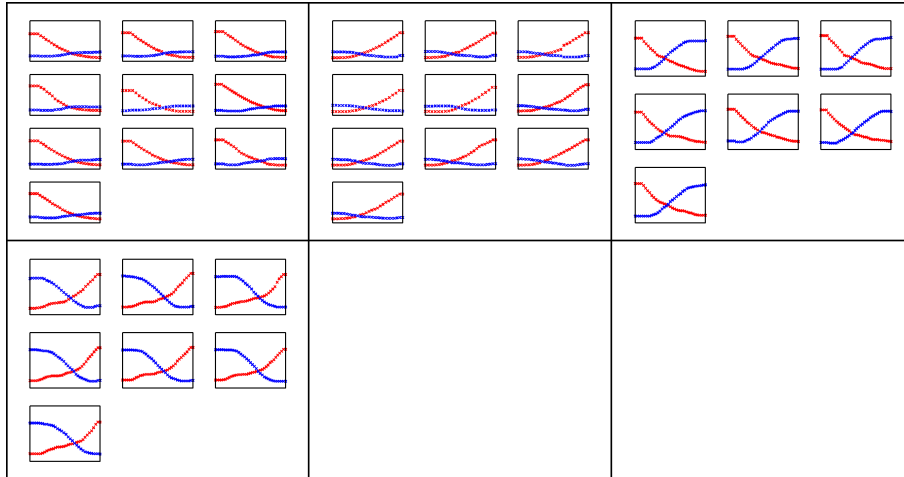
Figure 4: Benchmark: movement clusters from DATA SET 4
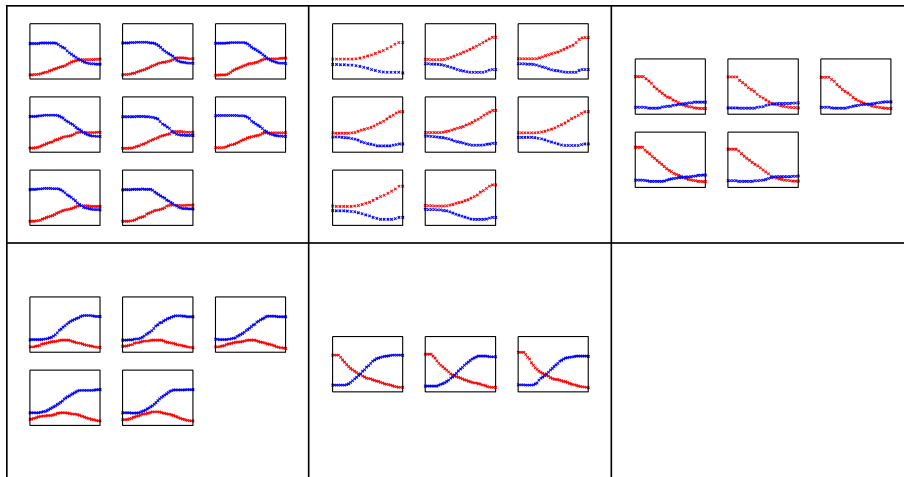
Figure 5: Benchmark: movement clusters from DATA SET 5

5
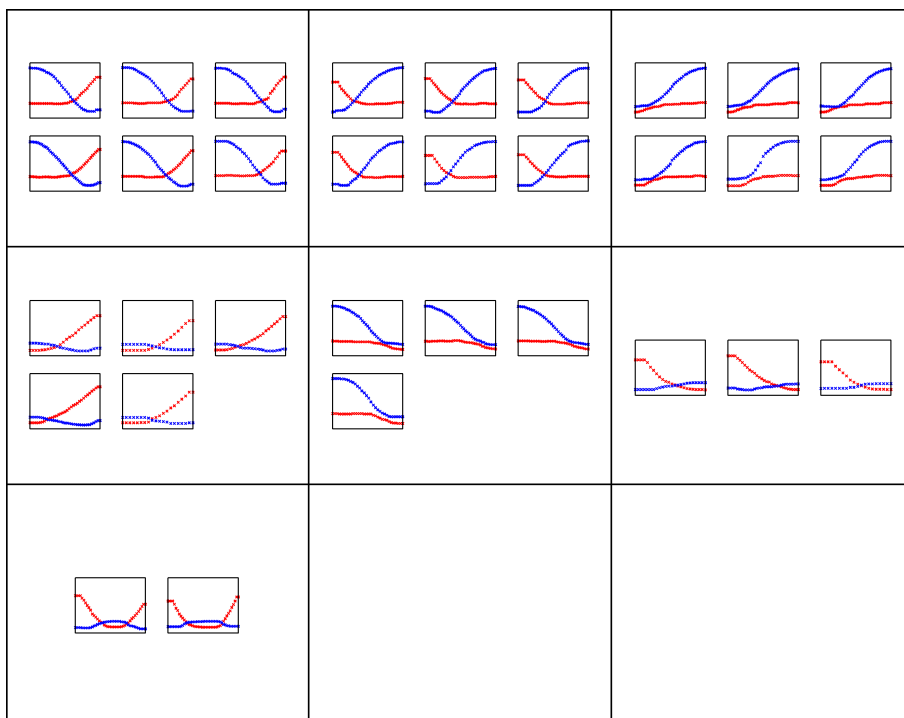
Figure 6: Benchmark: movement clusters from DATA SET 6
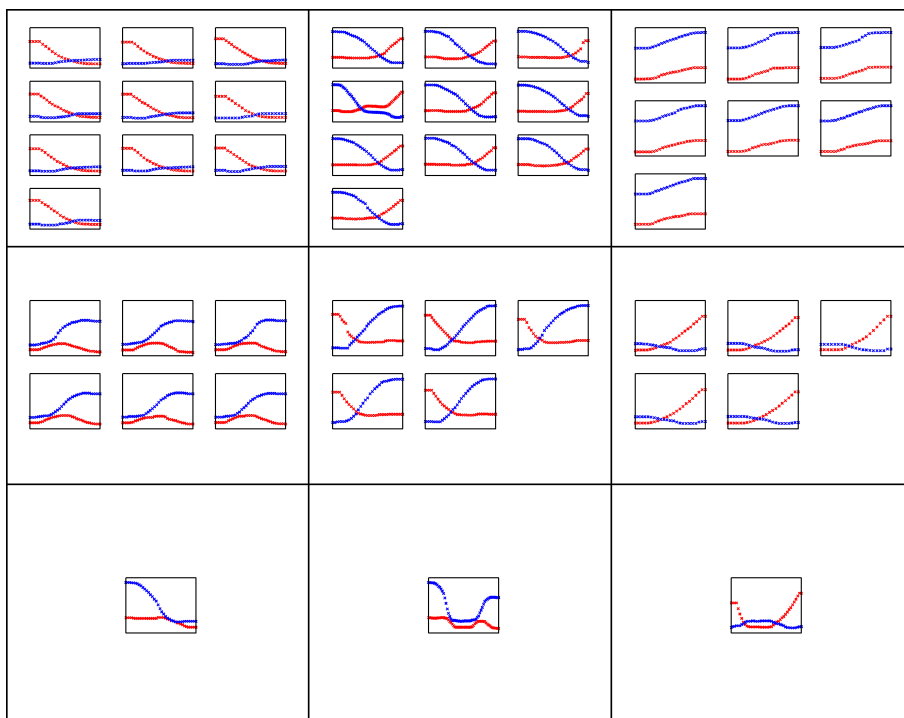
Figure 7: Benchmark: movement clusters from DATA SET 7
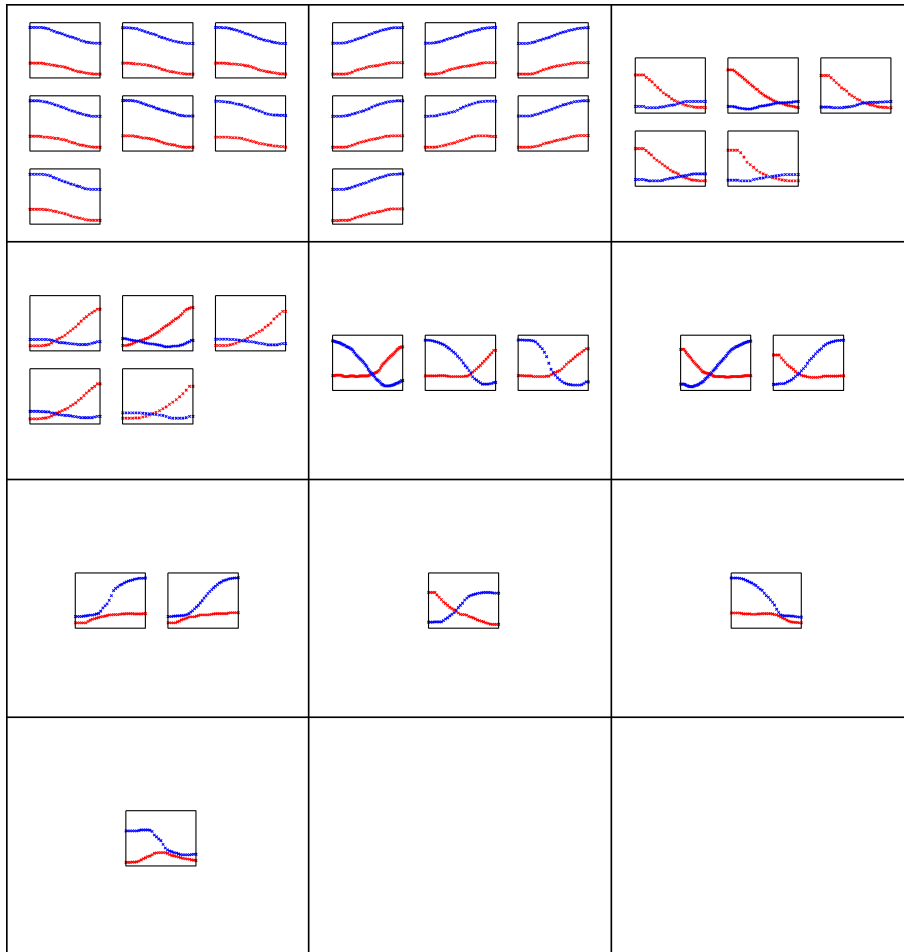
Figure 8: Benchmark: movement clusters from DATA SET 8
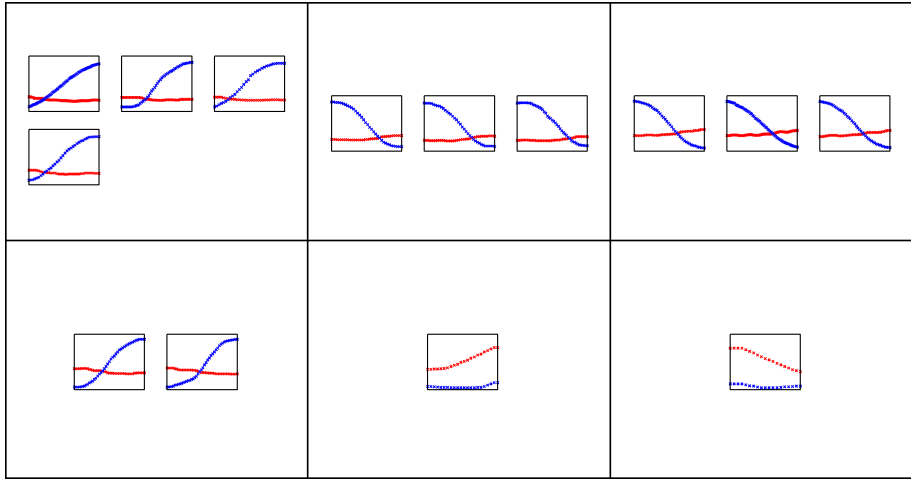
Figure 9: Benchmark: movement clusters from DATA SET 9
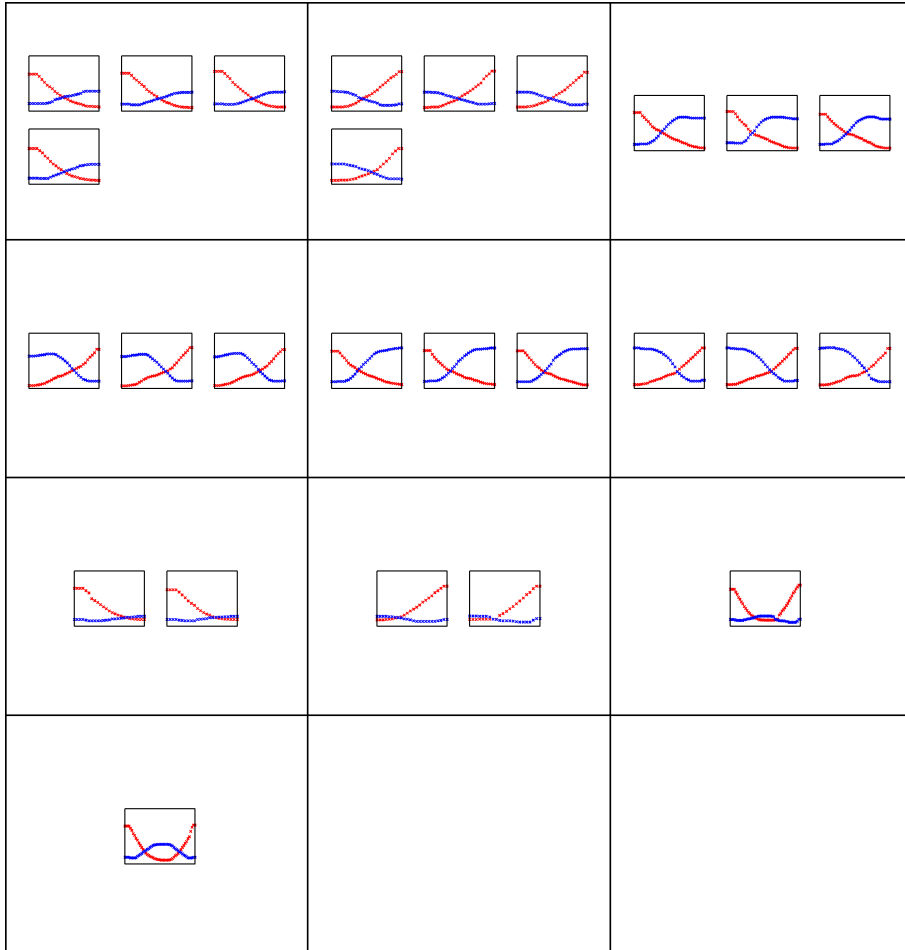
Figure 10: Benchmark: movement clusters from DATA SET 10

10
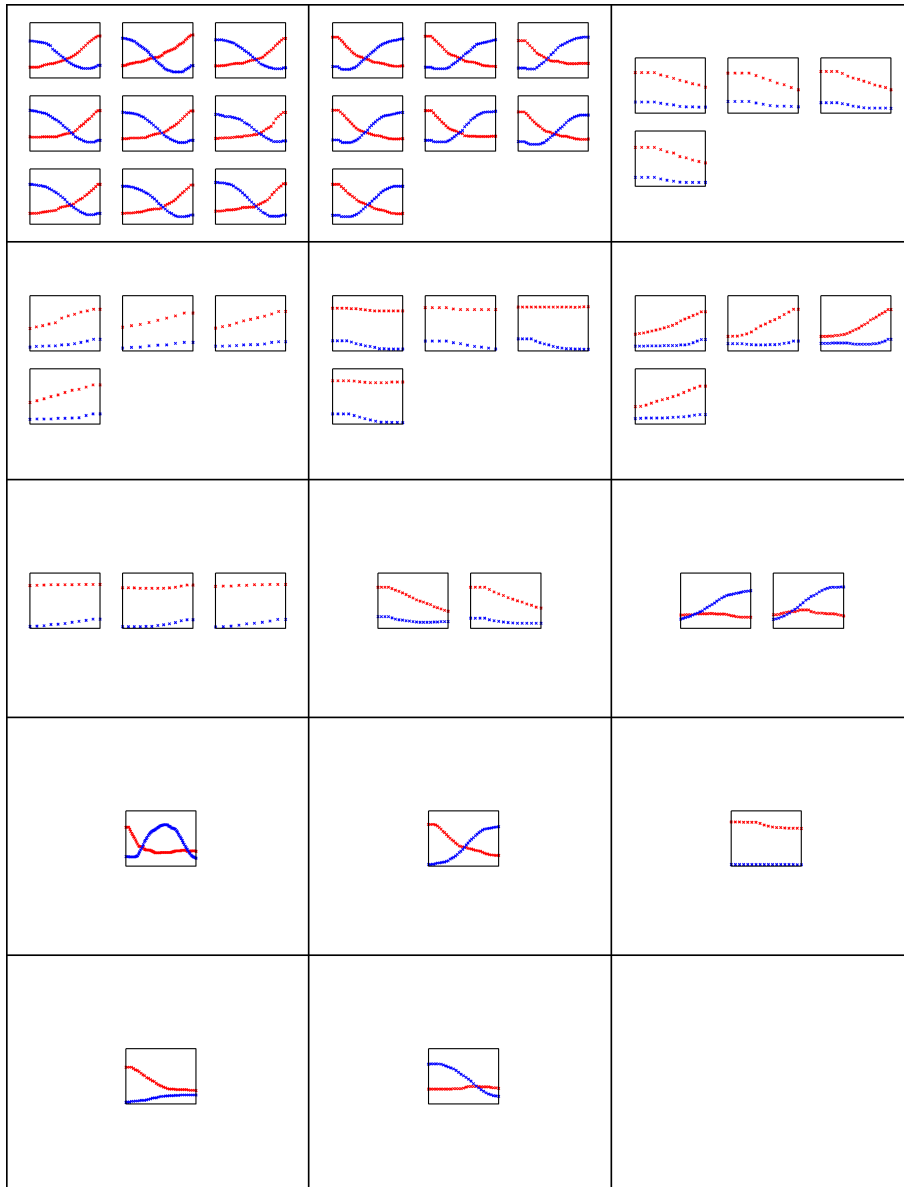
Figure 11: Benchmark: movement clusters from DATA SET 11
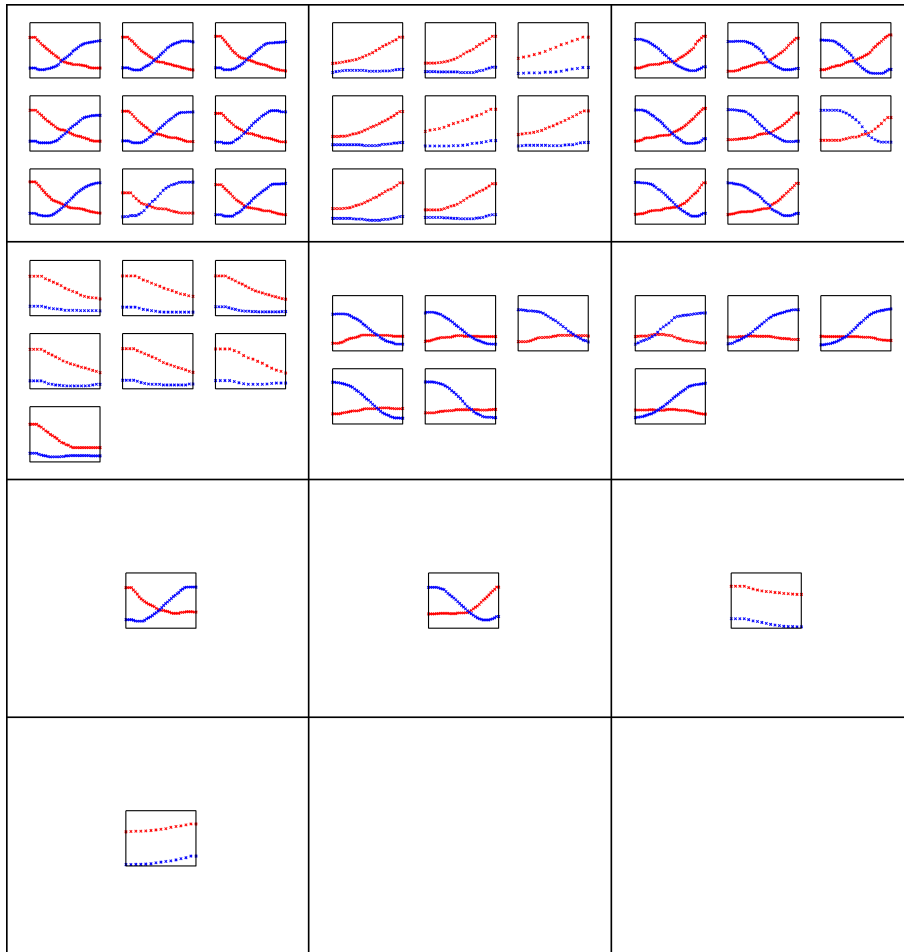
Figure 12: Benchmark: movement clusters from DATA SET 12
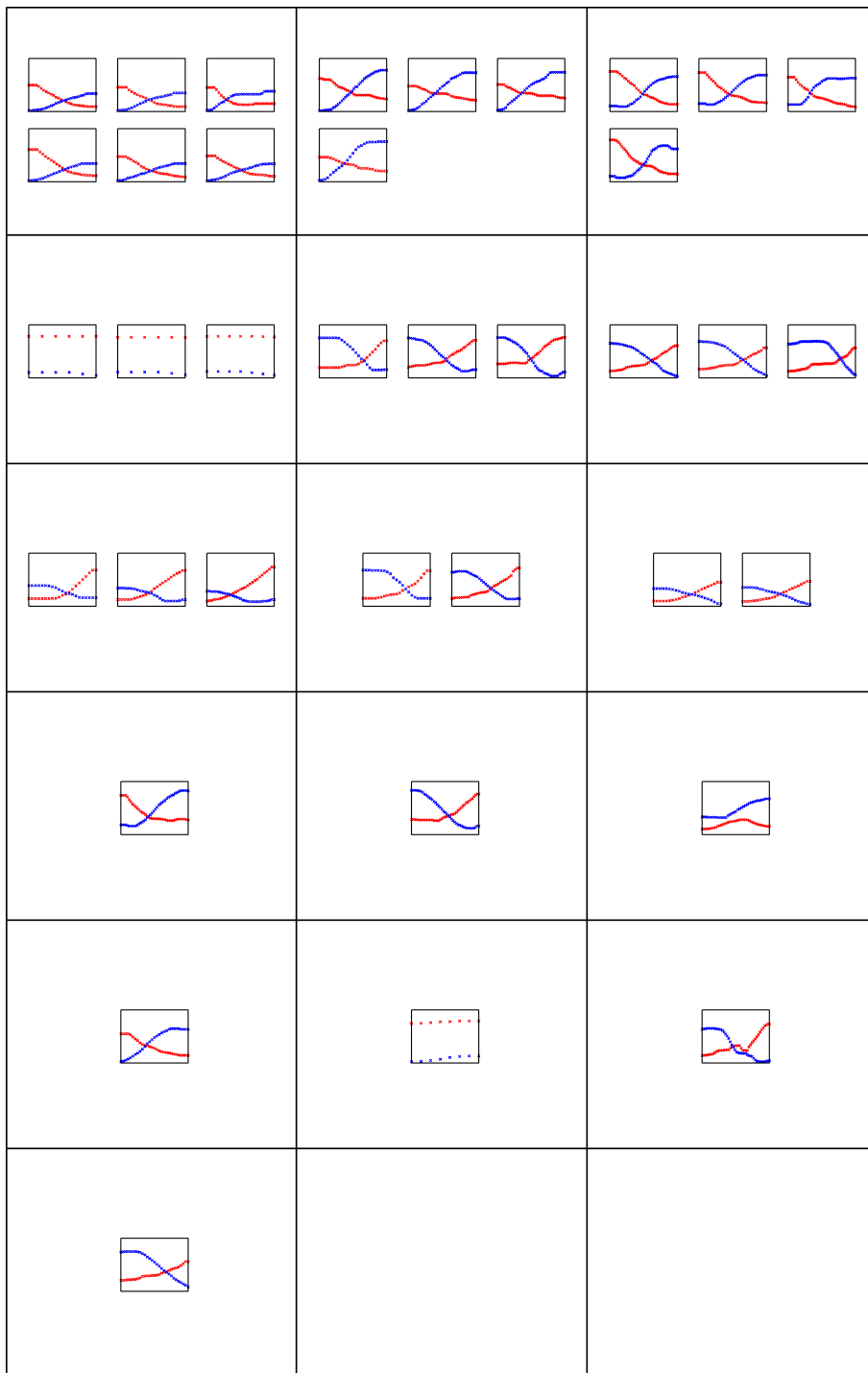
Figure 13: Benchmark: movement clusters from DATA SET 13
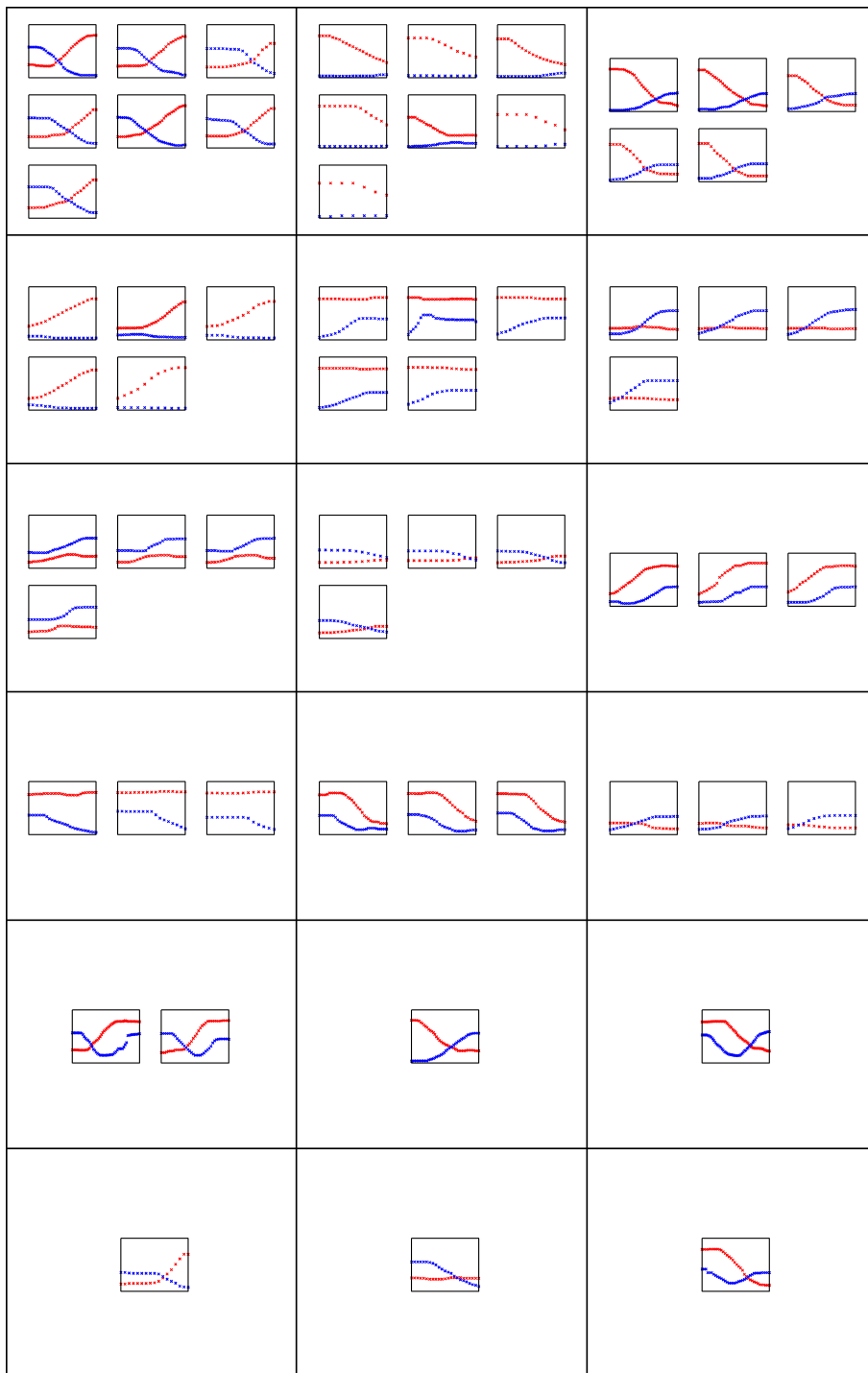
Figure 14: Benchmark: movement clusters from DATA SET 14

Figure 15: Benchmark: movement clusters from DATA SET 15
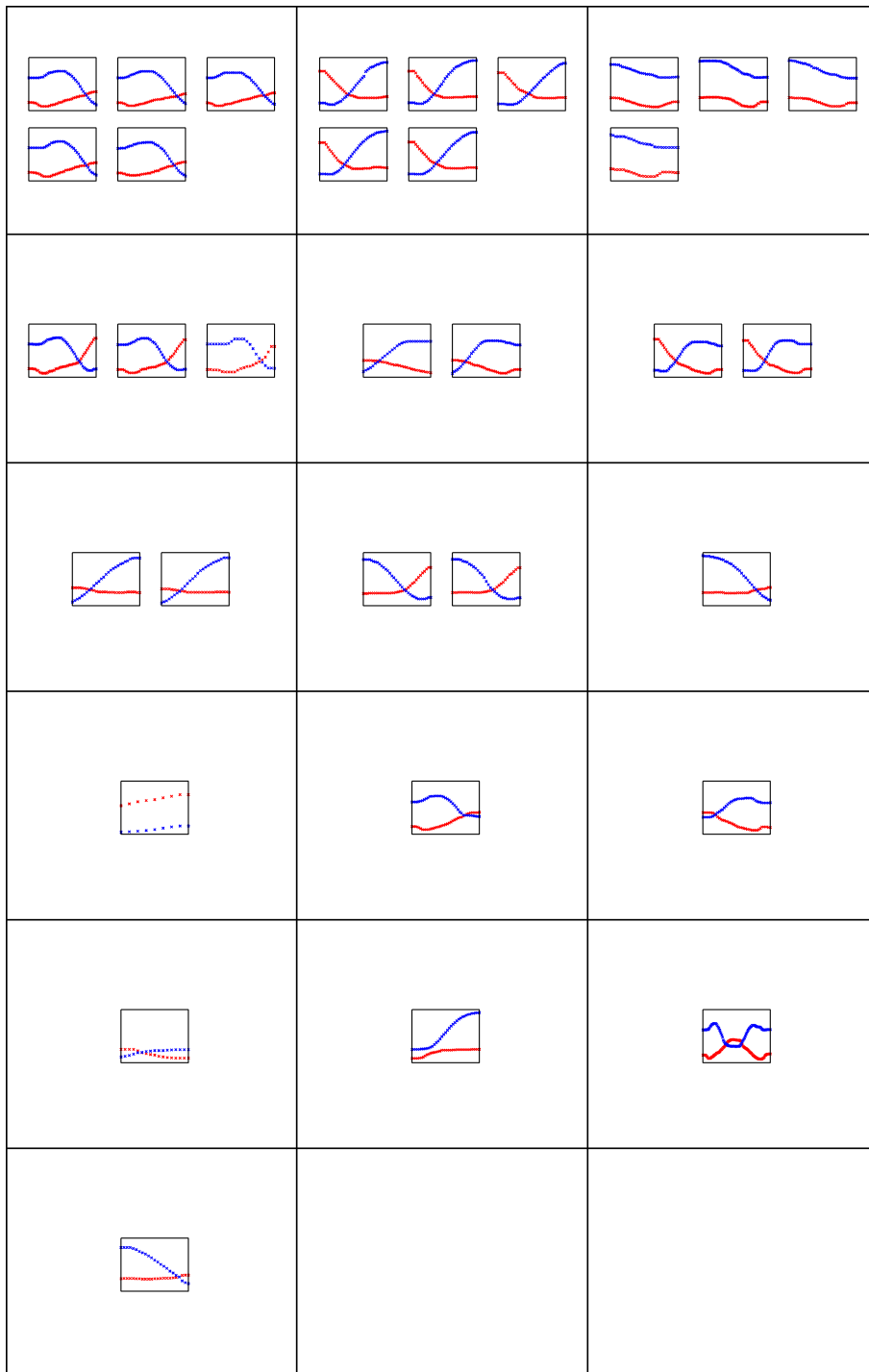
Figure 16: Graph Theoretic Clustering Output: movement clusters from DATA SET 1
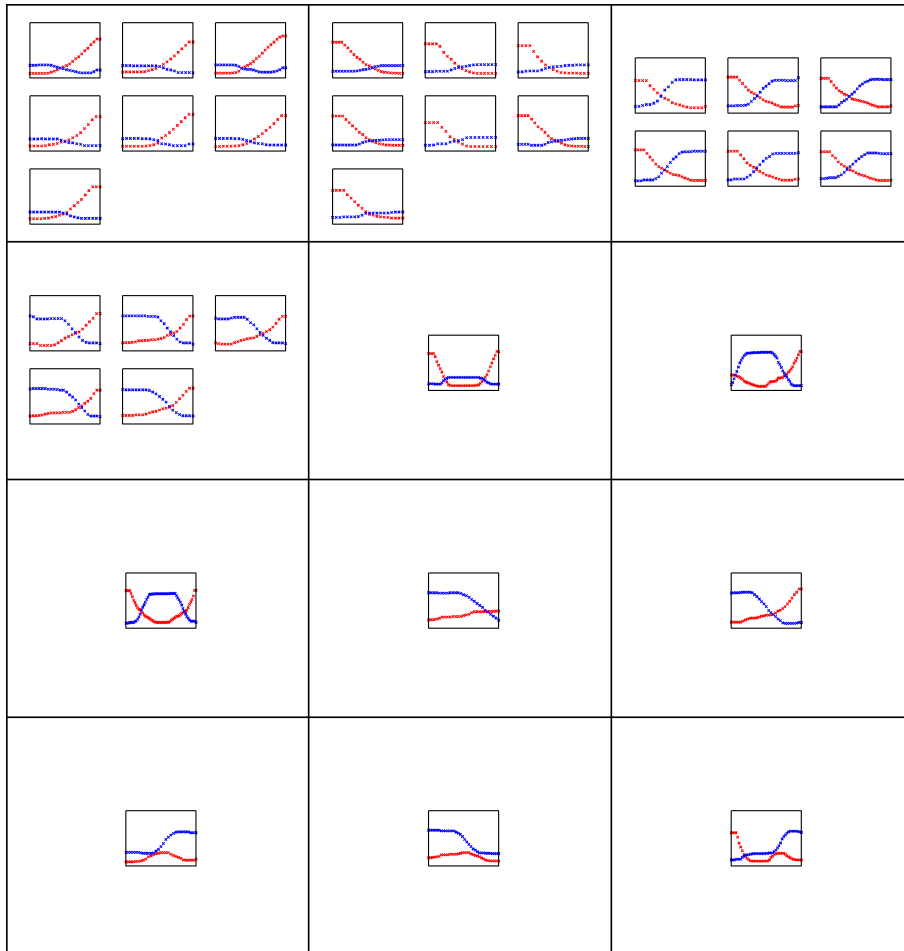
Figure 17: Graph Theoretic Clustering Output: movement clusters from DATA
SET 2
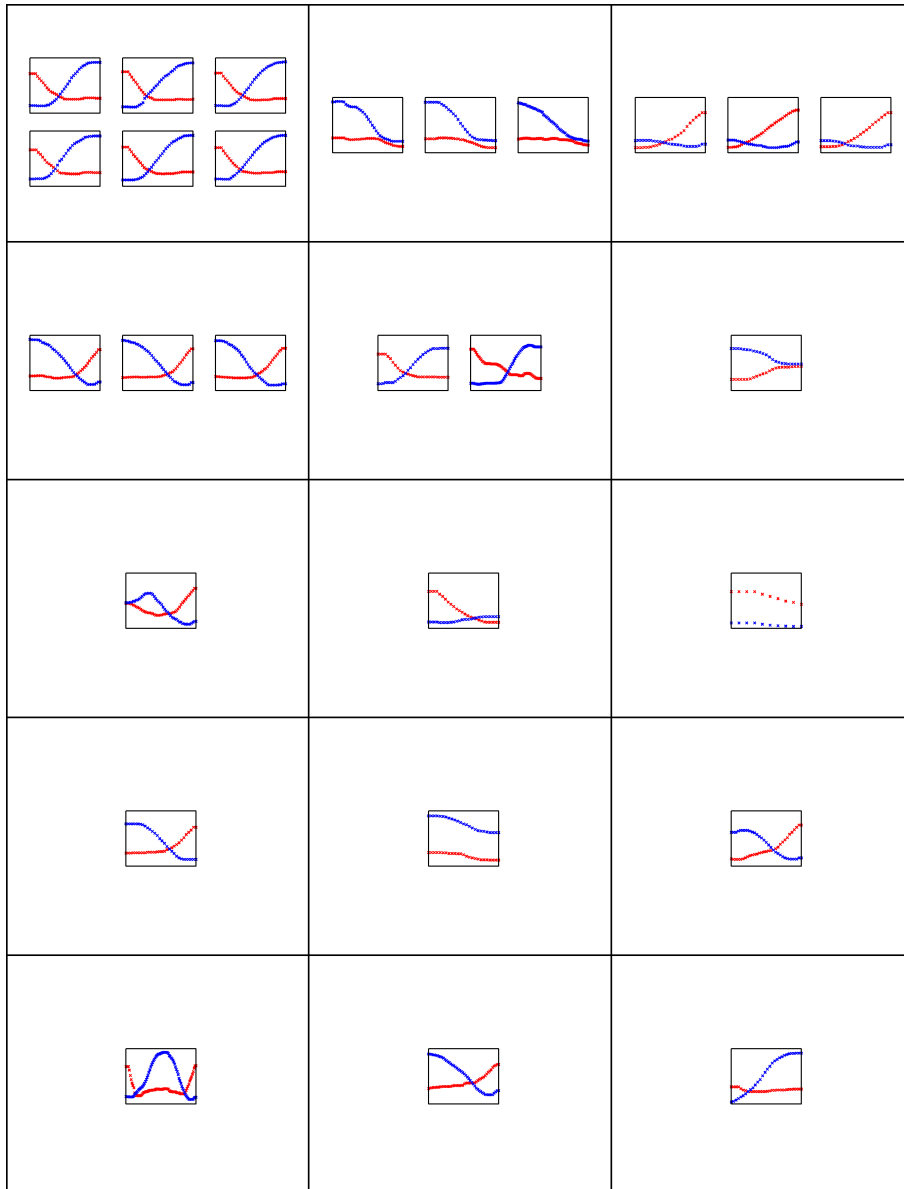
Figure 18: Graph Theoretic Clustering Output: movement clusters from DATA SET 3
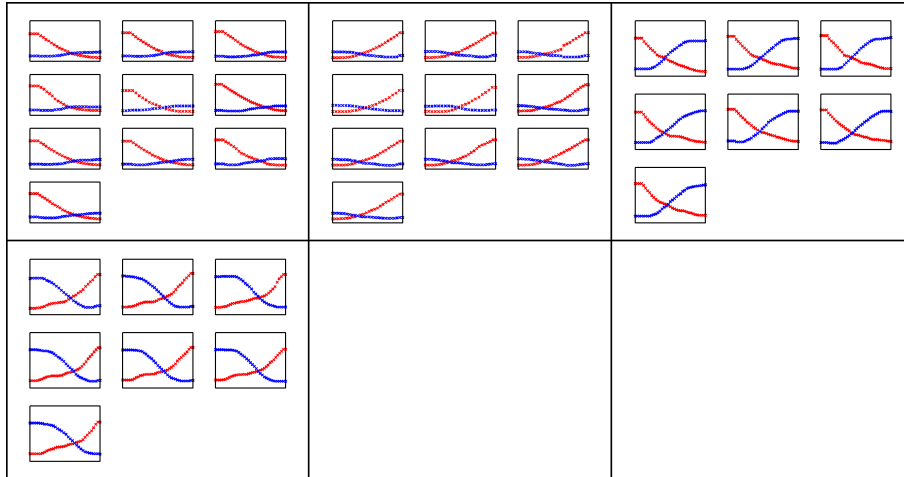
Figure 19: Graph Theoretic Clustering Output: movement clusters from DATA SET 4
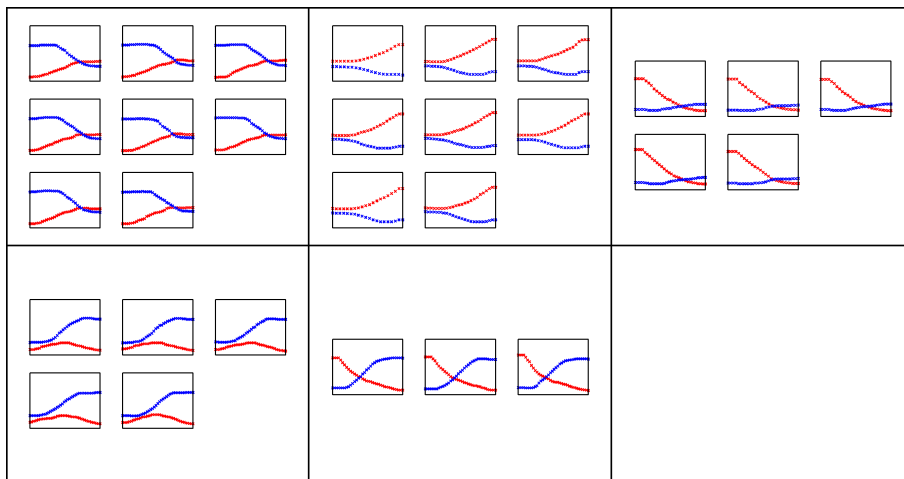
Figure 20: Graph Theoretic Clustering Output: movement clusters from DATA SET 5
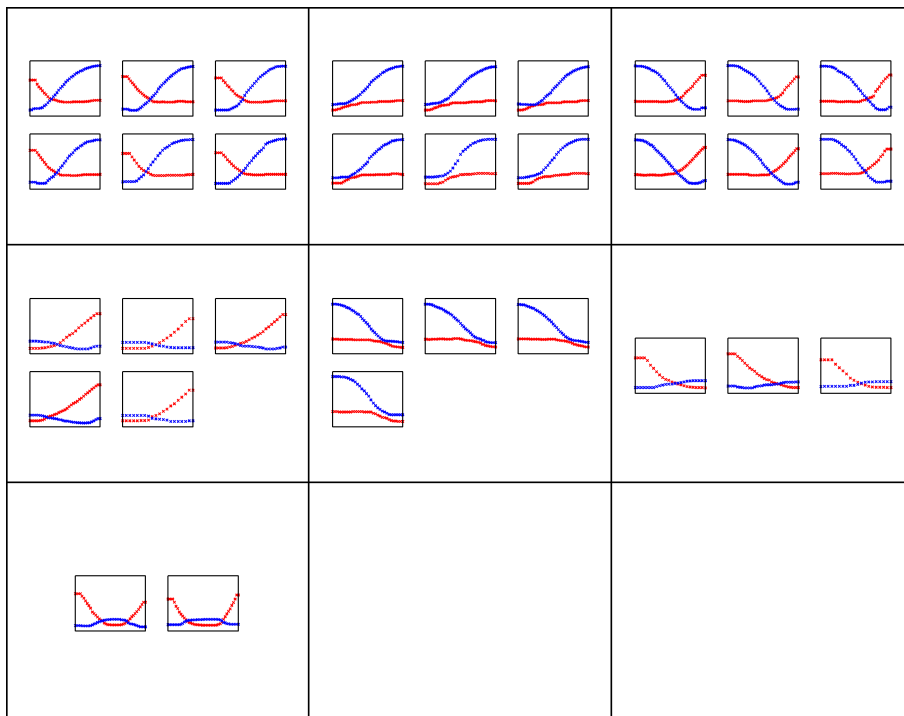
Figure 21: Graph Theoretic Clustering Output: movement clusters from DATA SET 6
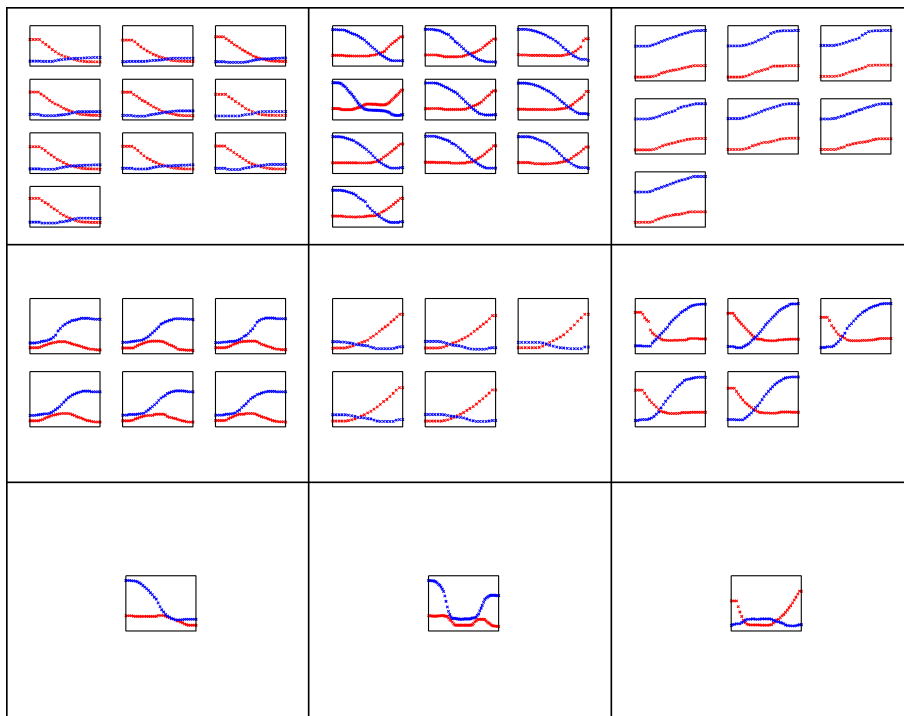
Figure 22: Graph Theoretic Clustering Output: movement clusters from DATA SET 7
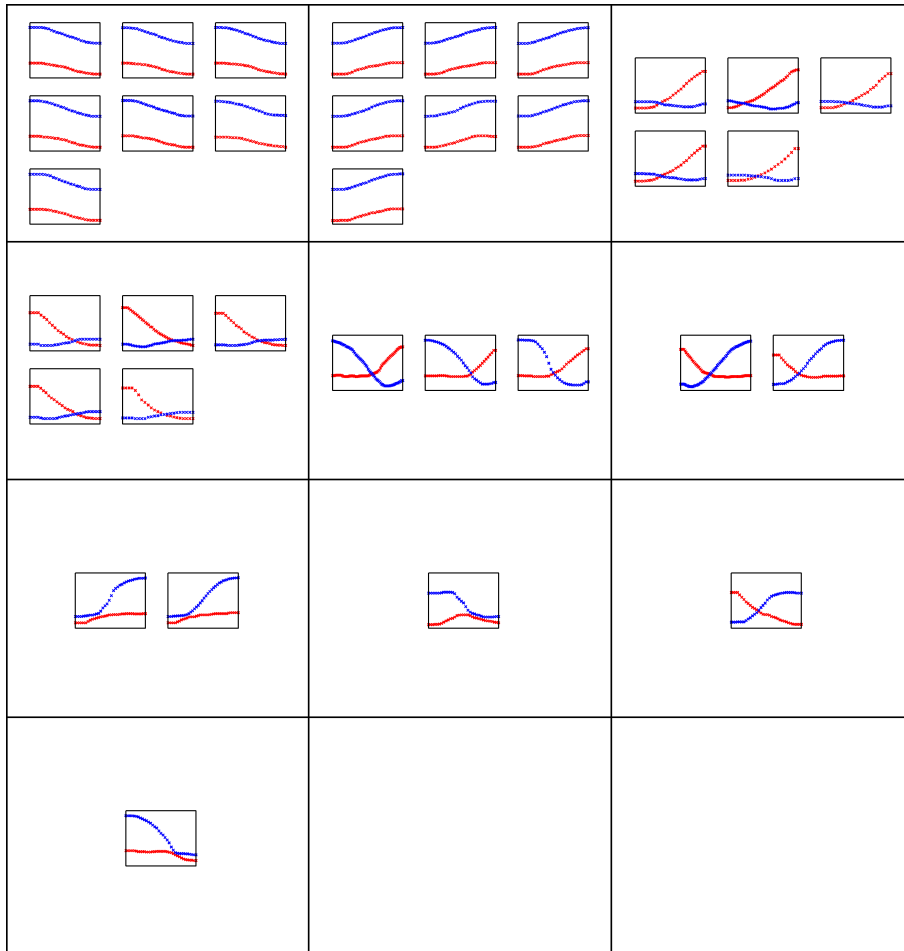
Figure 23: Graph Theoretic Clustering Output: movement clusters from DATA
SET 8
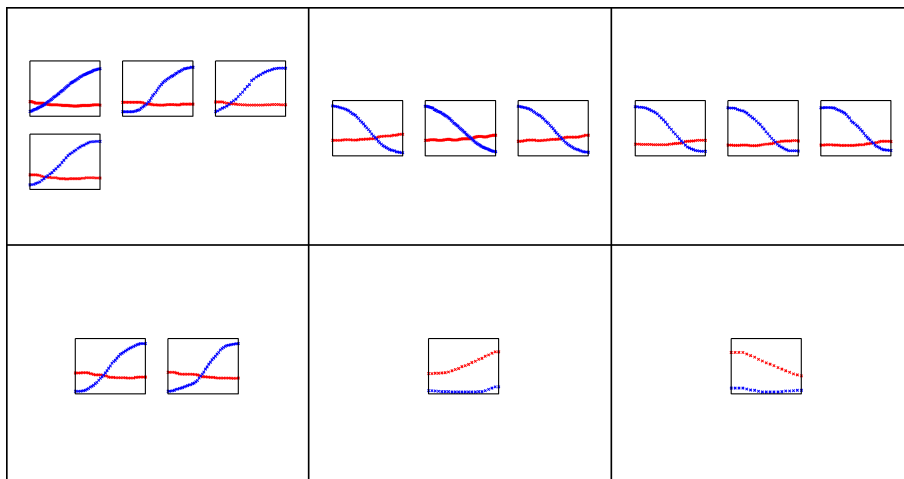
Figure 24: Graph Theoretic Clustering Output: movement clusters from DATA
SET 9
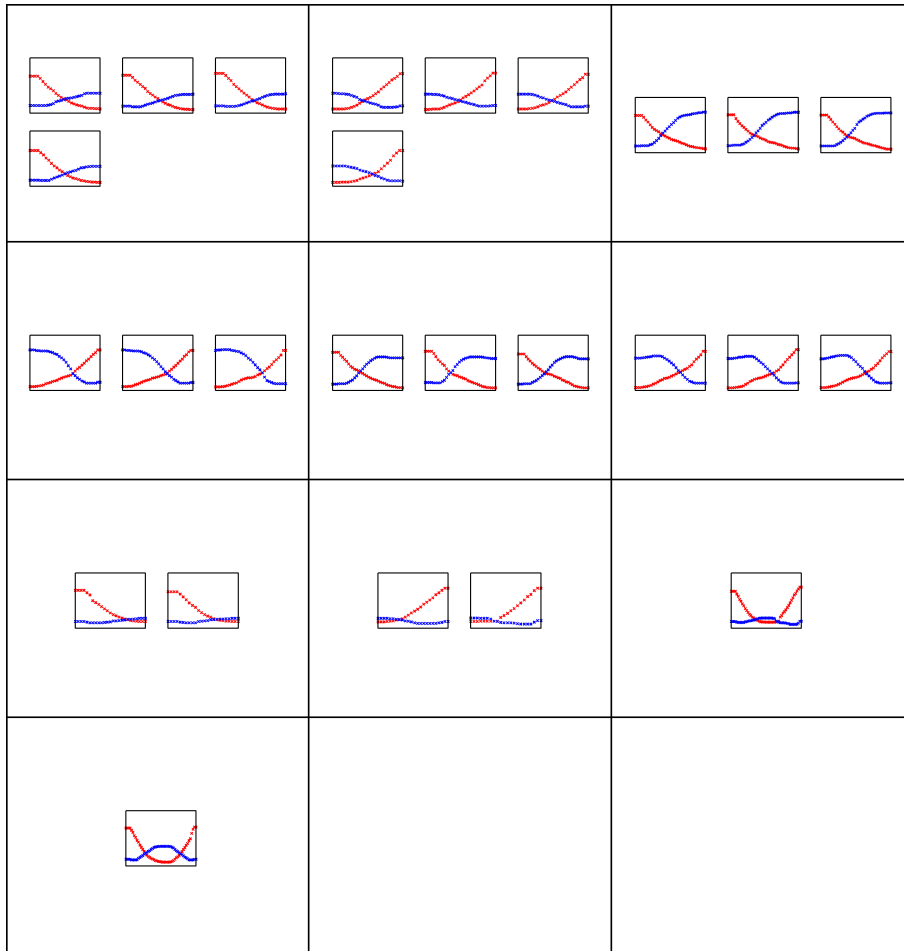
Figure 25: Graph Theoretic Clustering Output: movement clusters from DATA SET 10
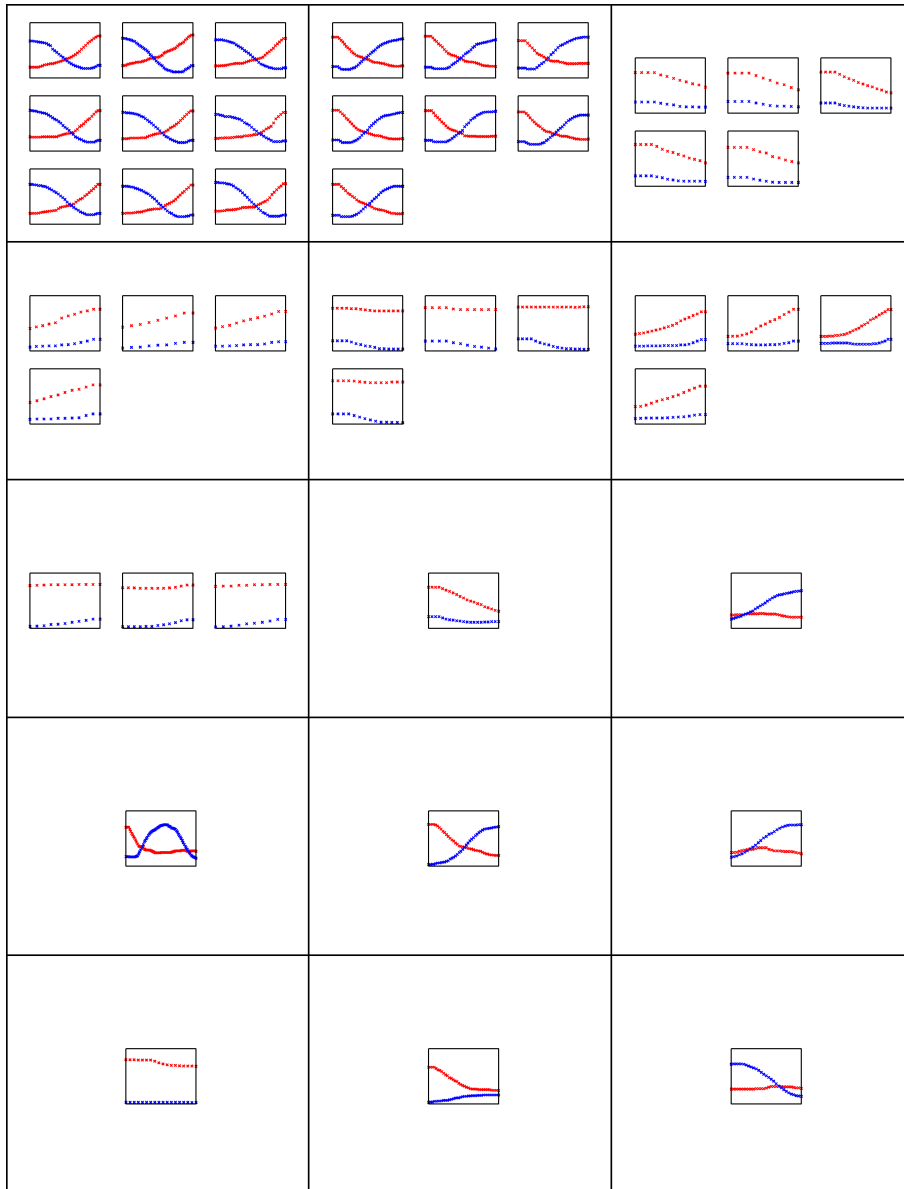
Figure 26: Graph Theoretic Clustering Output: movement clusters from DATA SET 11
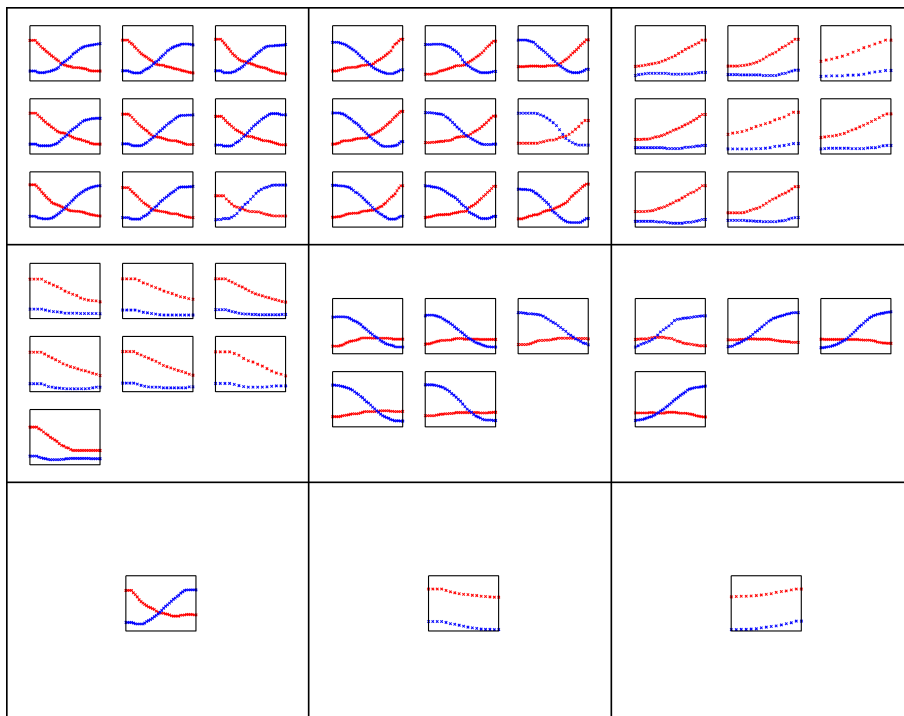
Figure 27: Graph Theoretic Clustering Output: movement clusters from DATA SET 12
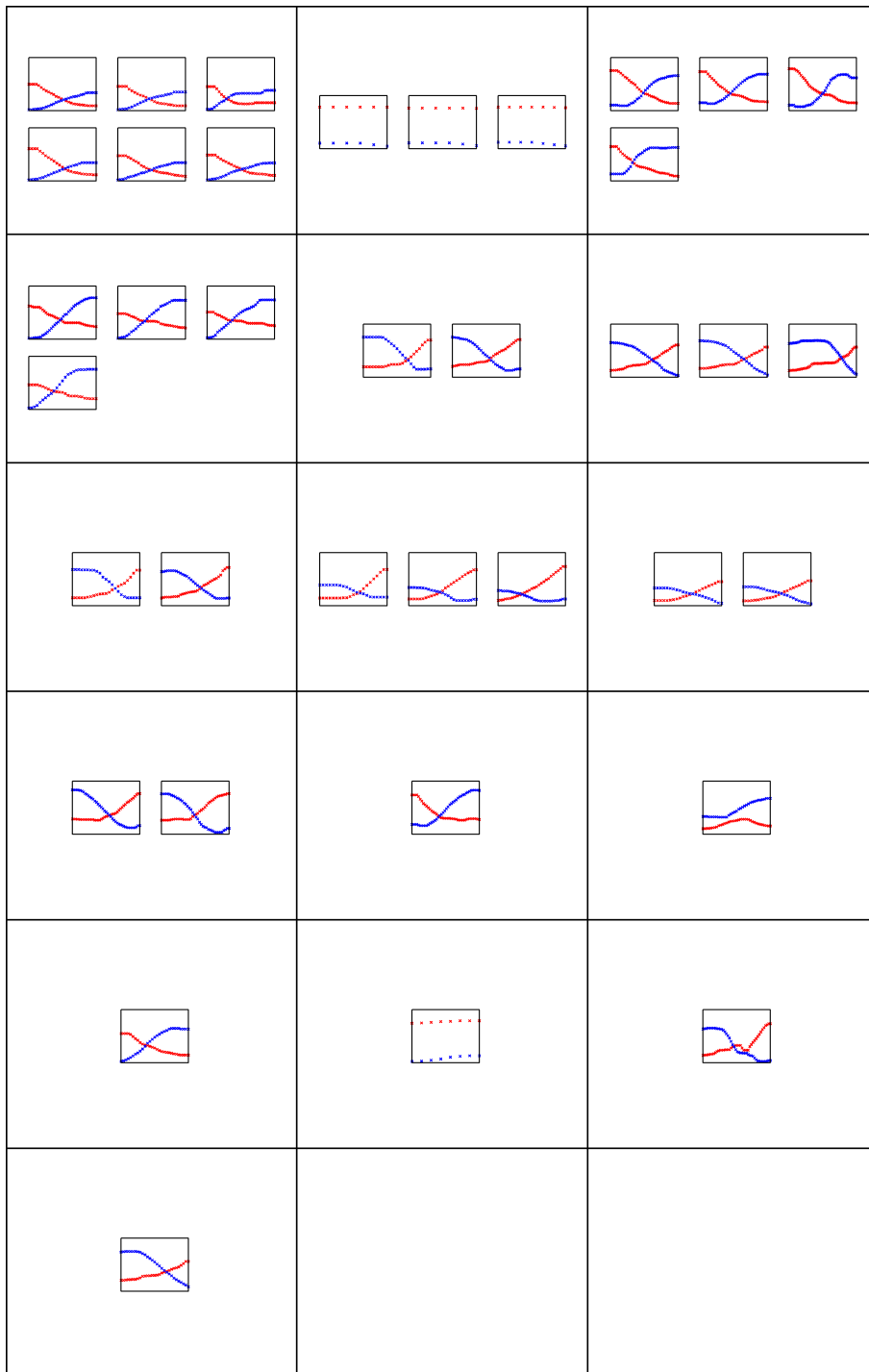
Figure 28: Graph Theoretic Clustering Output: movement clusters from DATA SET 13
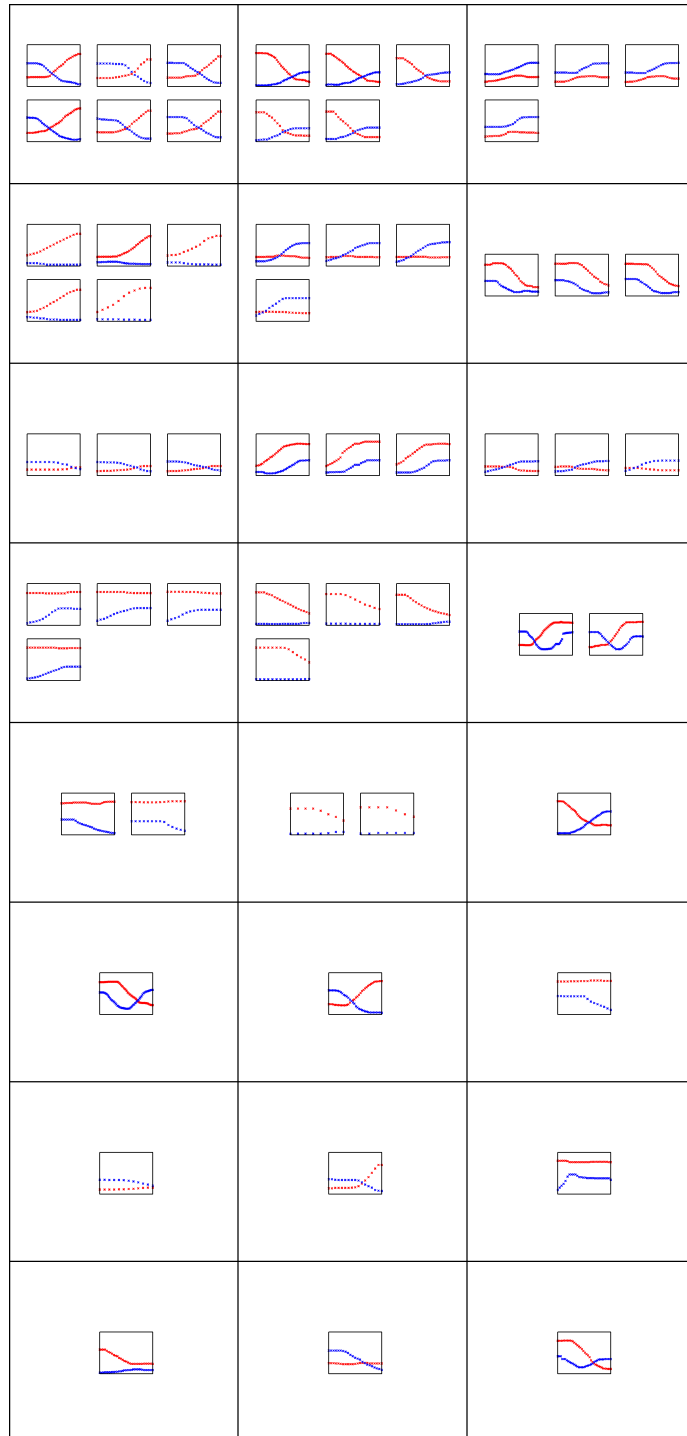
Figure 29: Graph Theoretic Clustering Output: movement clusters from DATA
SET 14
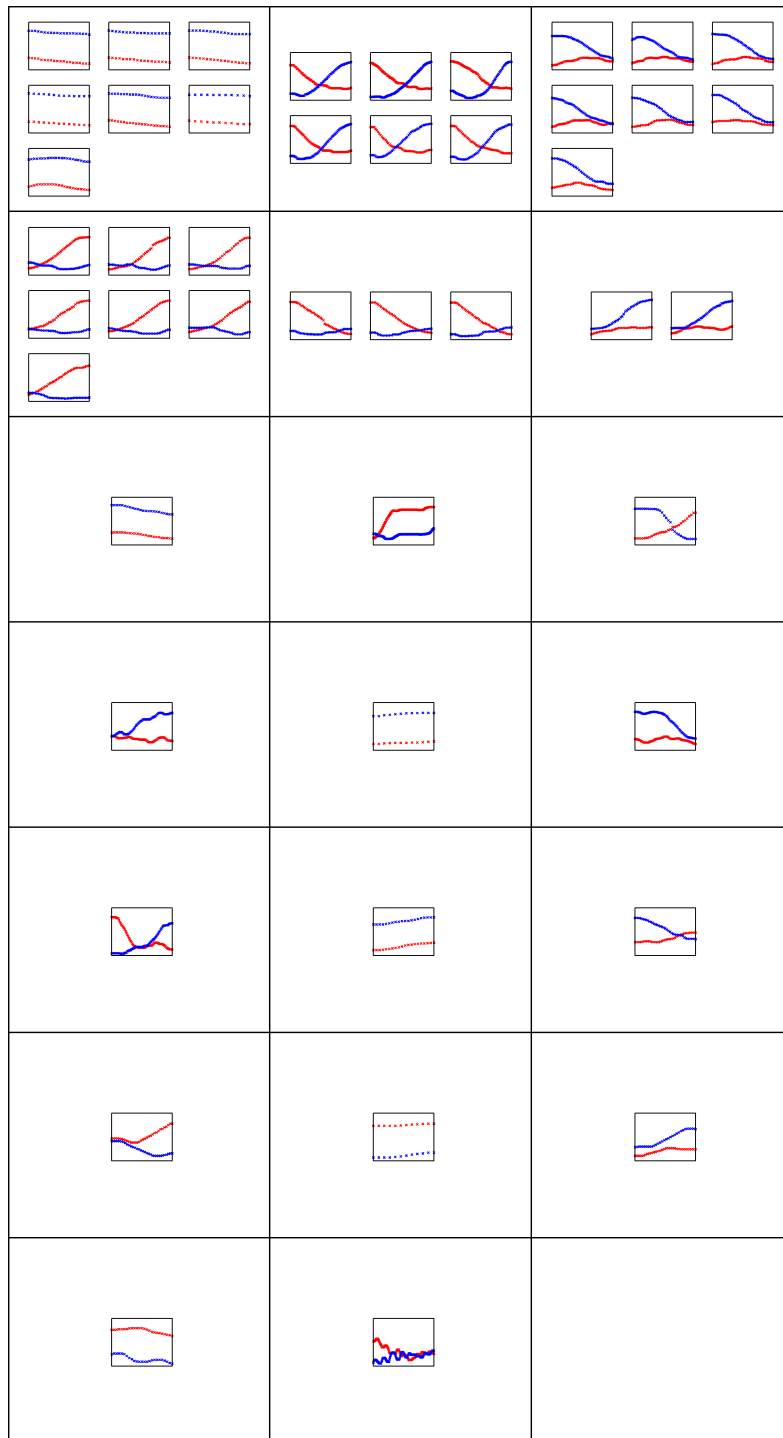
Figure 30: Graph Theoretic Clustering Output: movement clusters from DATA SET 15
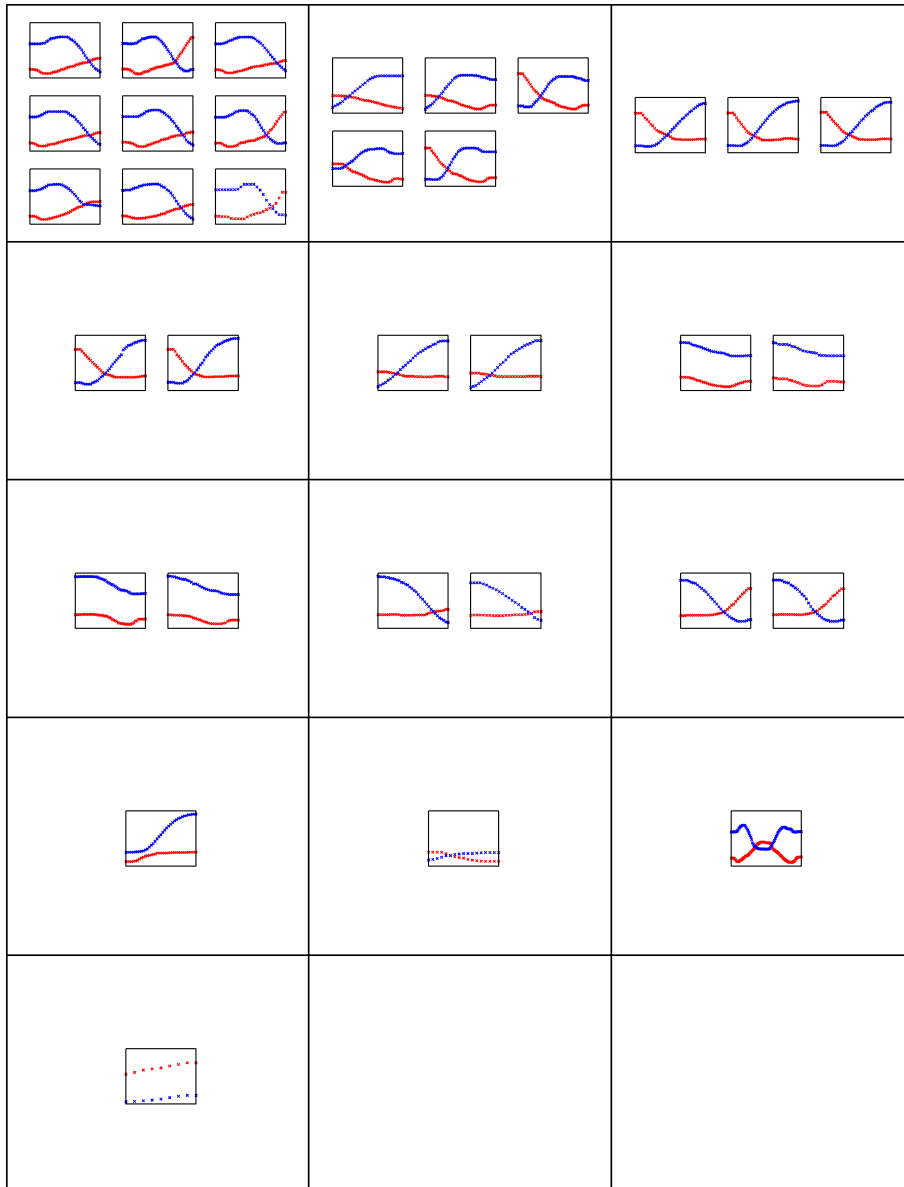
Figure 31: Hierarchical Clustering Output: movement clusters from DATA SET 1
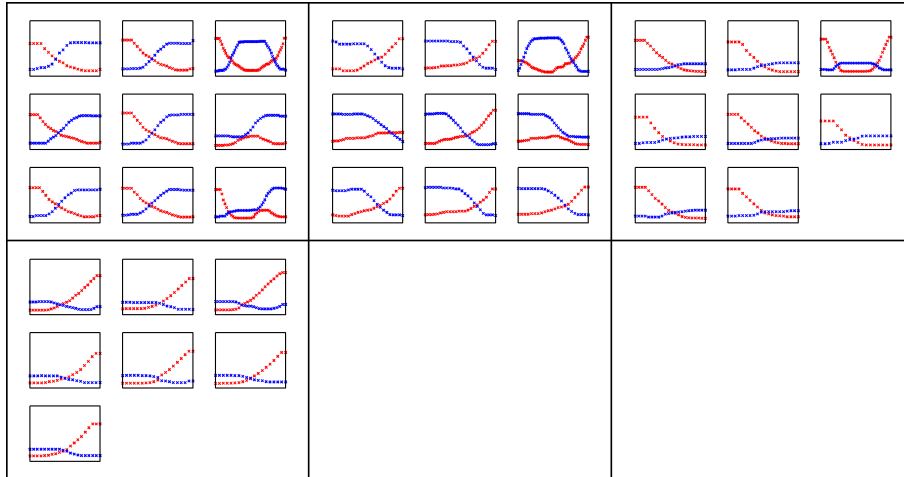
Figure 32: Hierarchical Clustering Output: movement clusters from DATA SET 2
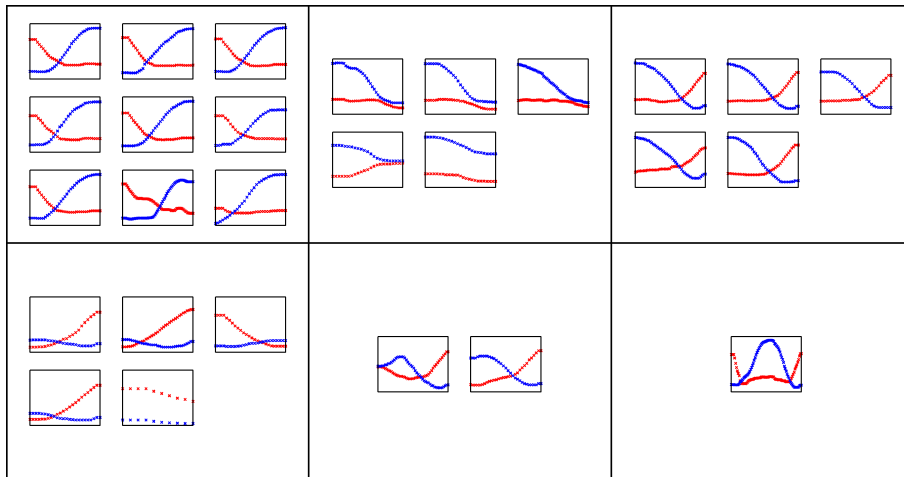
Figure 33: Hierarchical Clustering Output: movement clusters from DATA SET 3
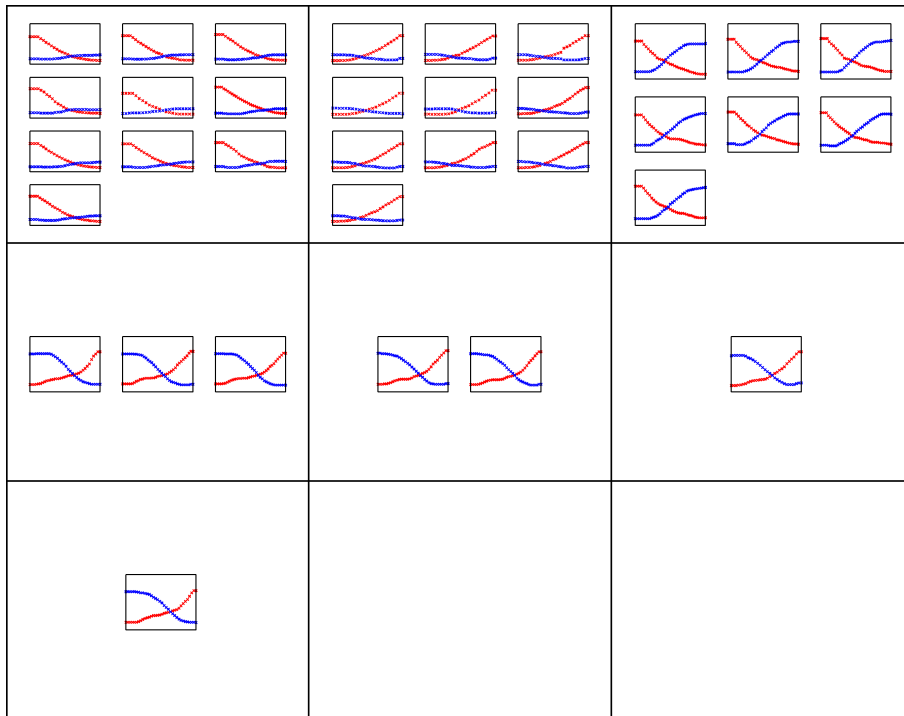
Figure 34: Hierarchical Clustering Output: movement clusters from DATA SET 4
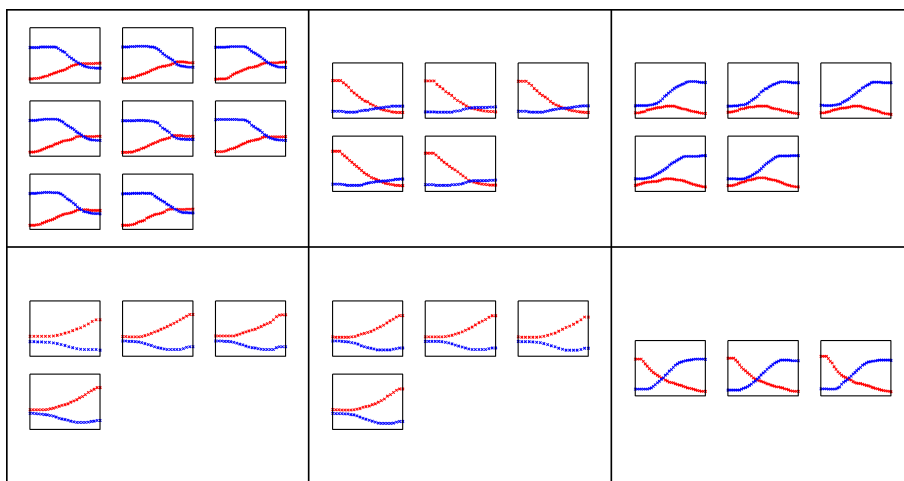
Figure 35: Hierarchical Clustering Output: movement clusters from DATA SET 5
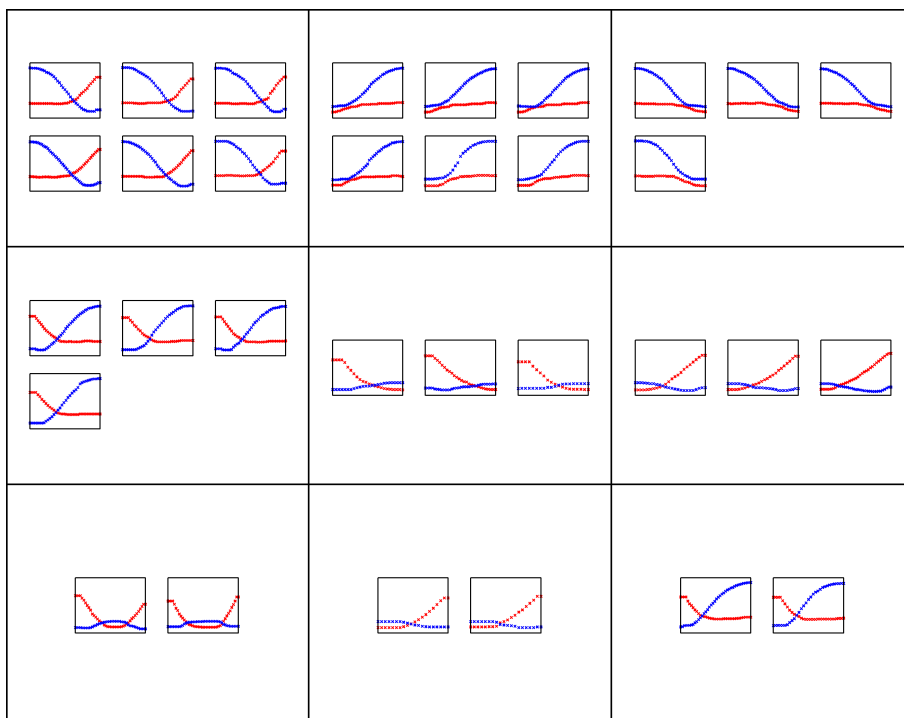
Figure 36: Hierarchical Clustering Output: movement clusters from DATA SET 6
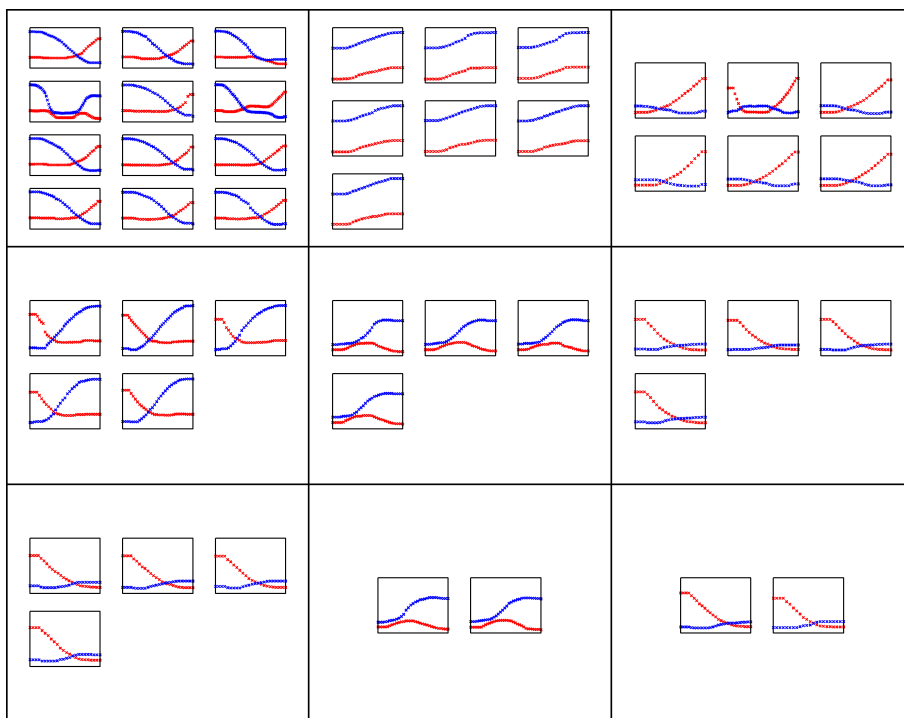
Figure 37: Hierarchical Clustering Output: movement clusters from DATA SET 7

34
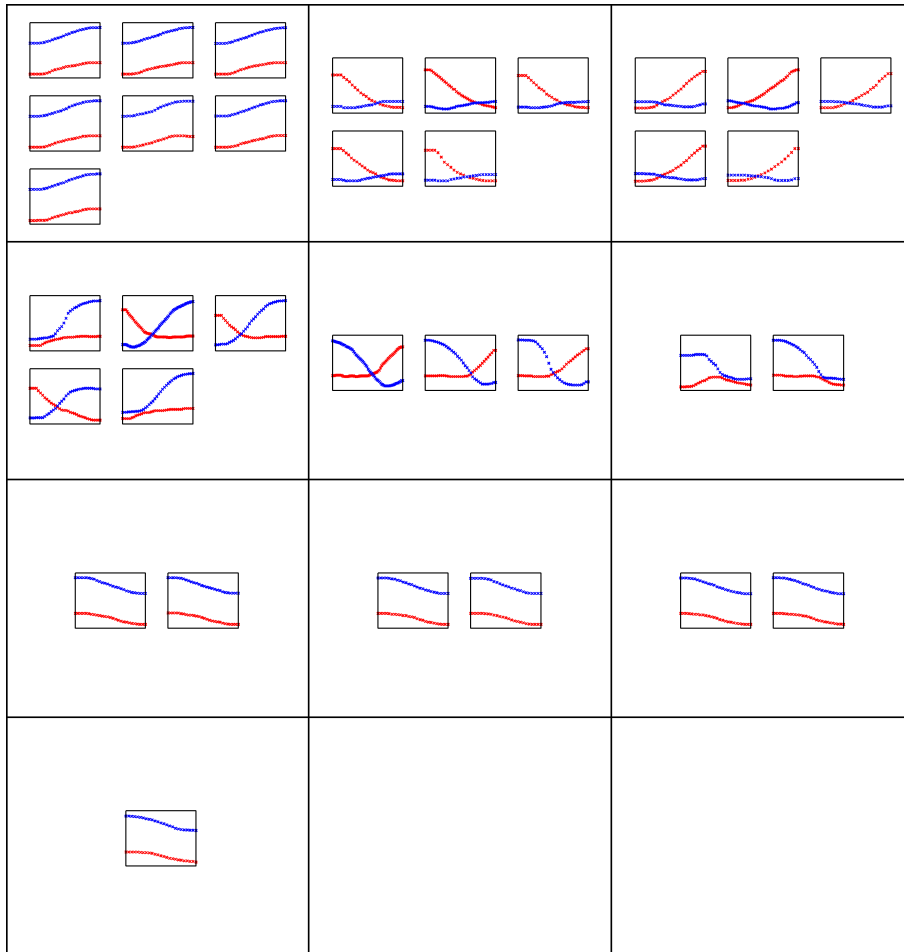
Figure 38: Hierarchical Clustering Output: movement clusters from DATA SET 8
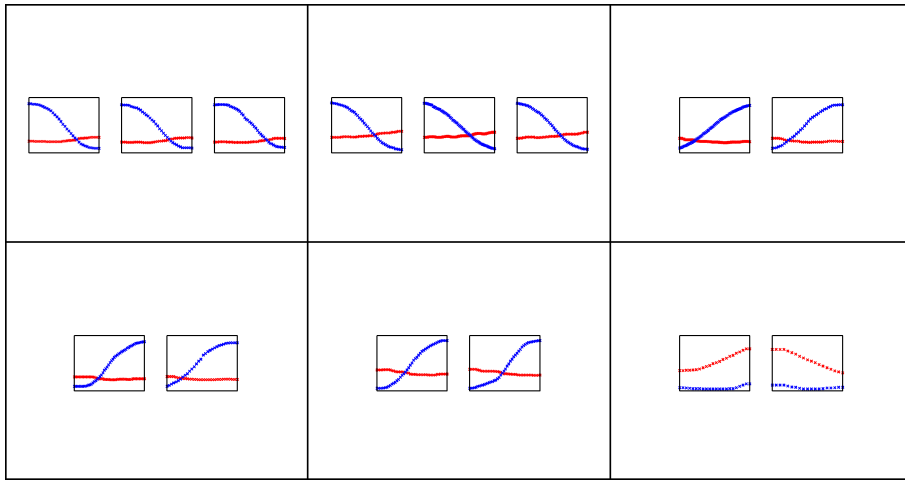
Figure 39: Hierarchical Clustering Output: movement clusters from DATA SET 9
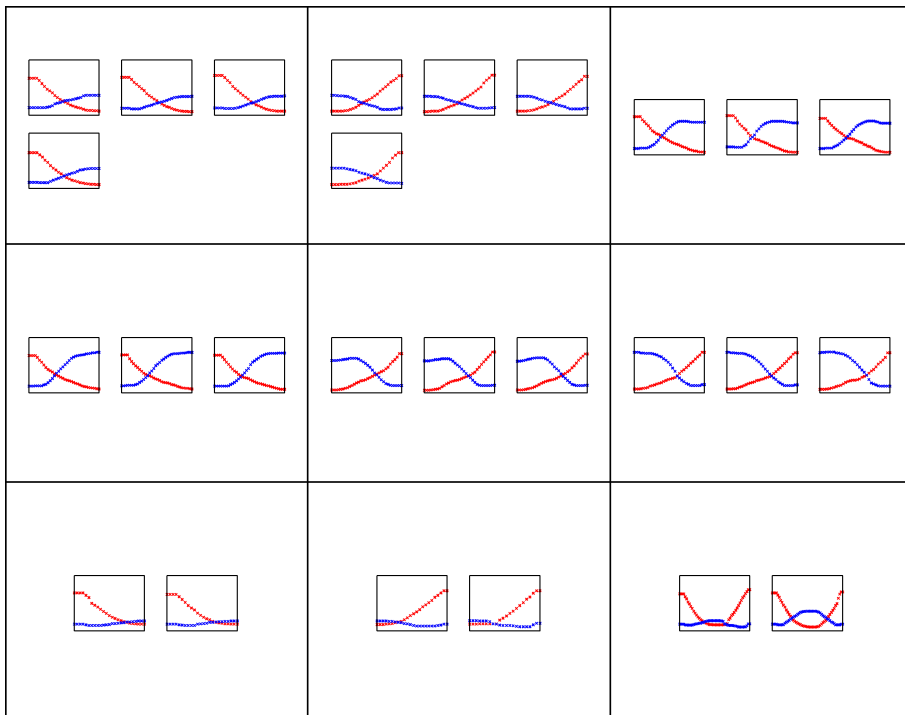
Figure 40: Hierarchical Clustering Output: movement clusters from DATA SET 10
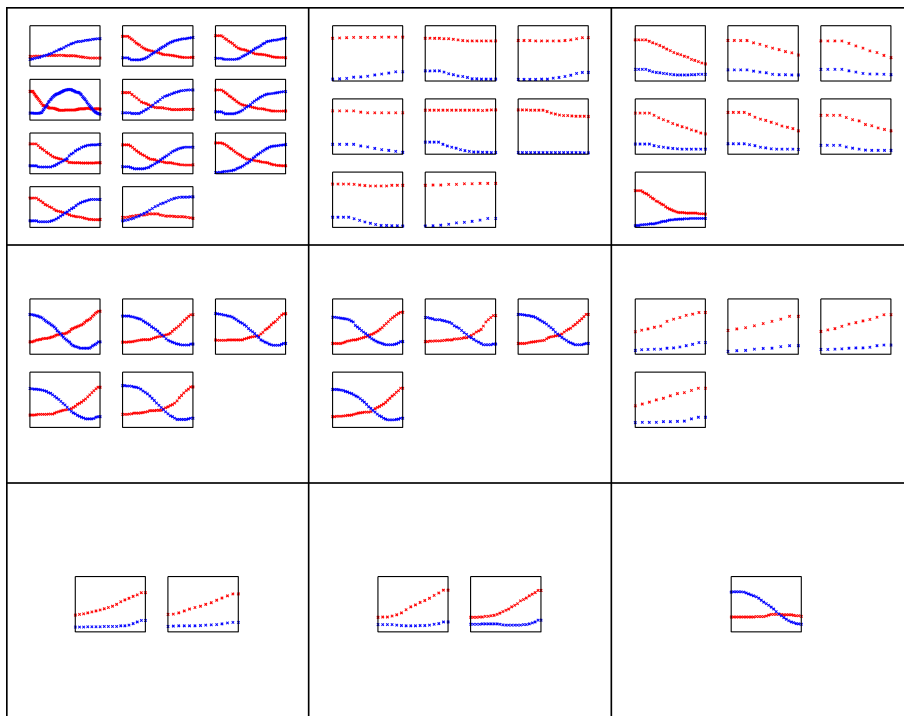
Figure 41: Hierarchical Clustering Output: movement clusters from DATA SET 11

38
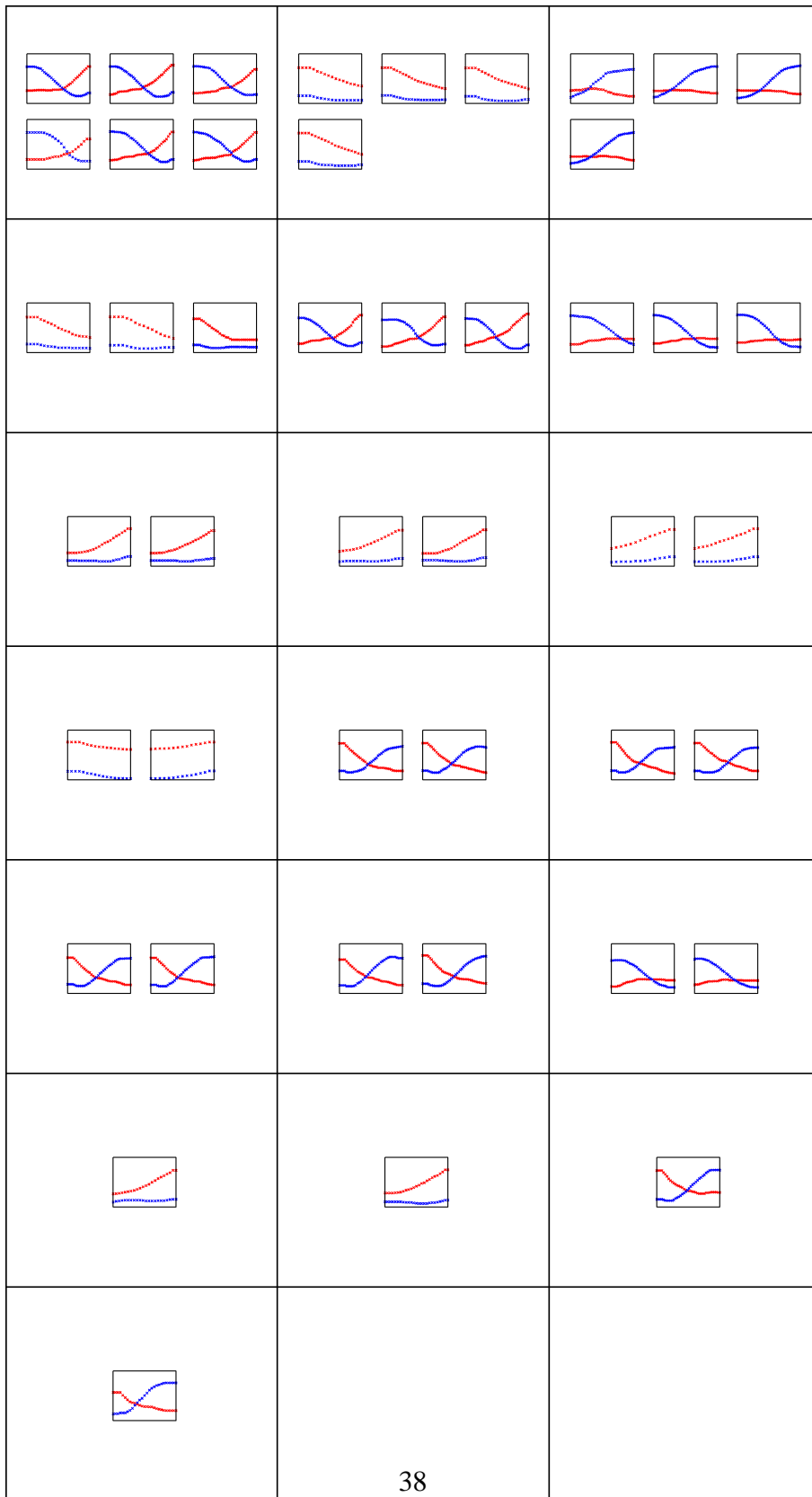
Figure 42: Hierarchical Clustering Output: movement clusters from DATA SET 12
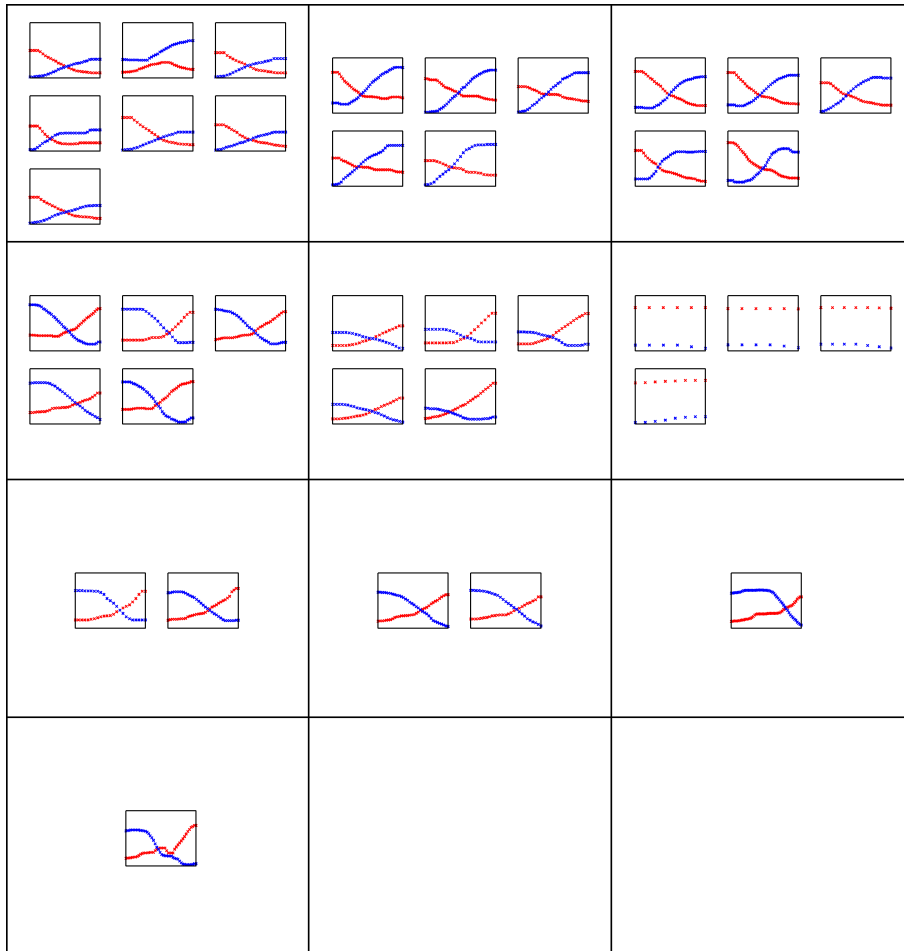
Figure 43: Hierarchical Clustering Output: movement clusters from DATA SET 13
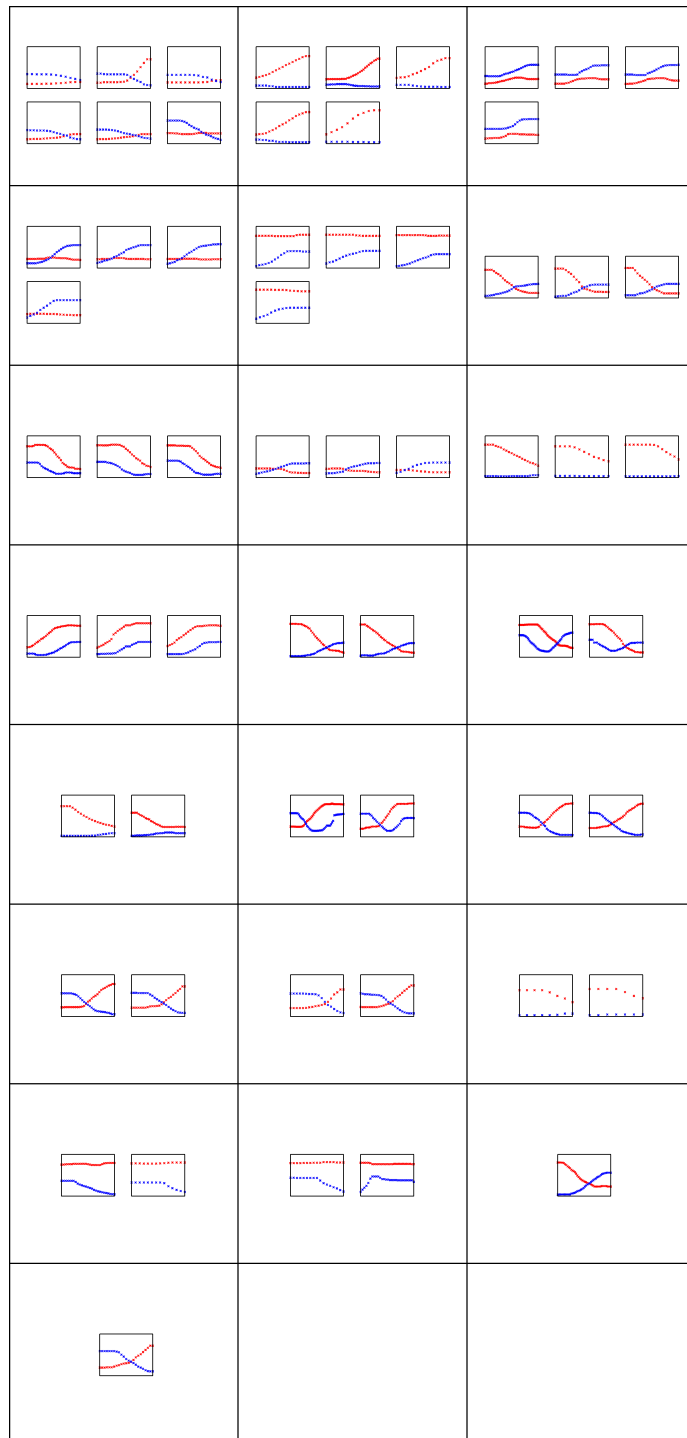
Figure 44: Hierarchical Clustering Output: movement clusters from DATA SET 14
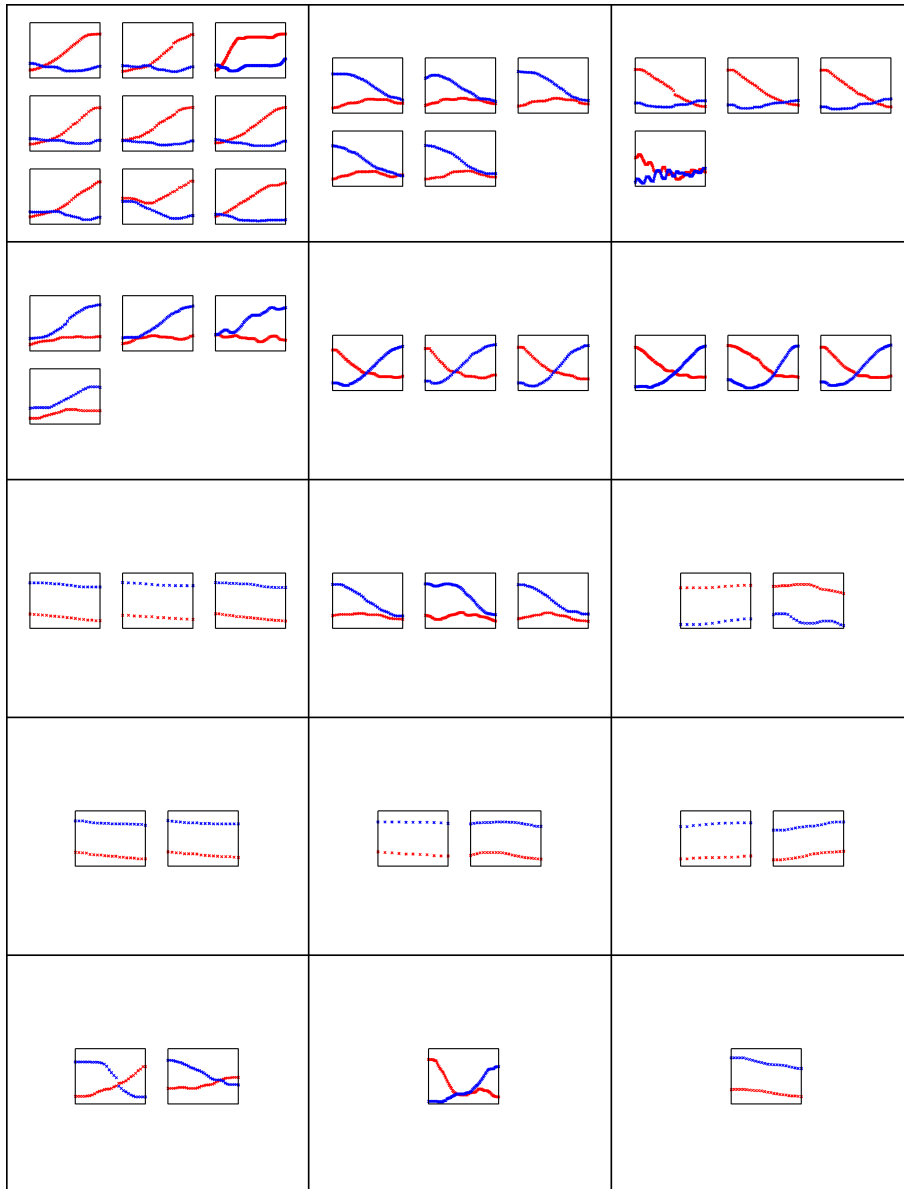
Figure 45: Hierarchical Clustering Output: movement clusters from DATA SET 15
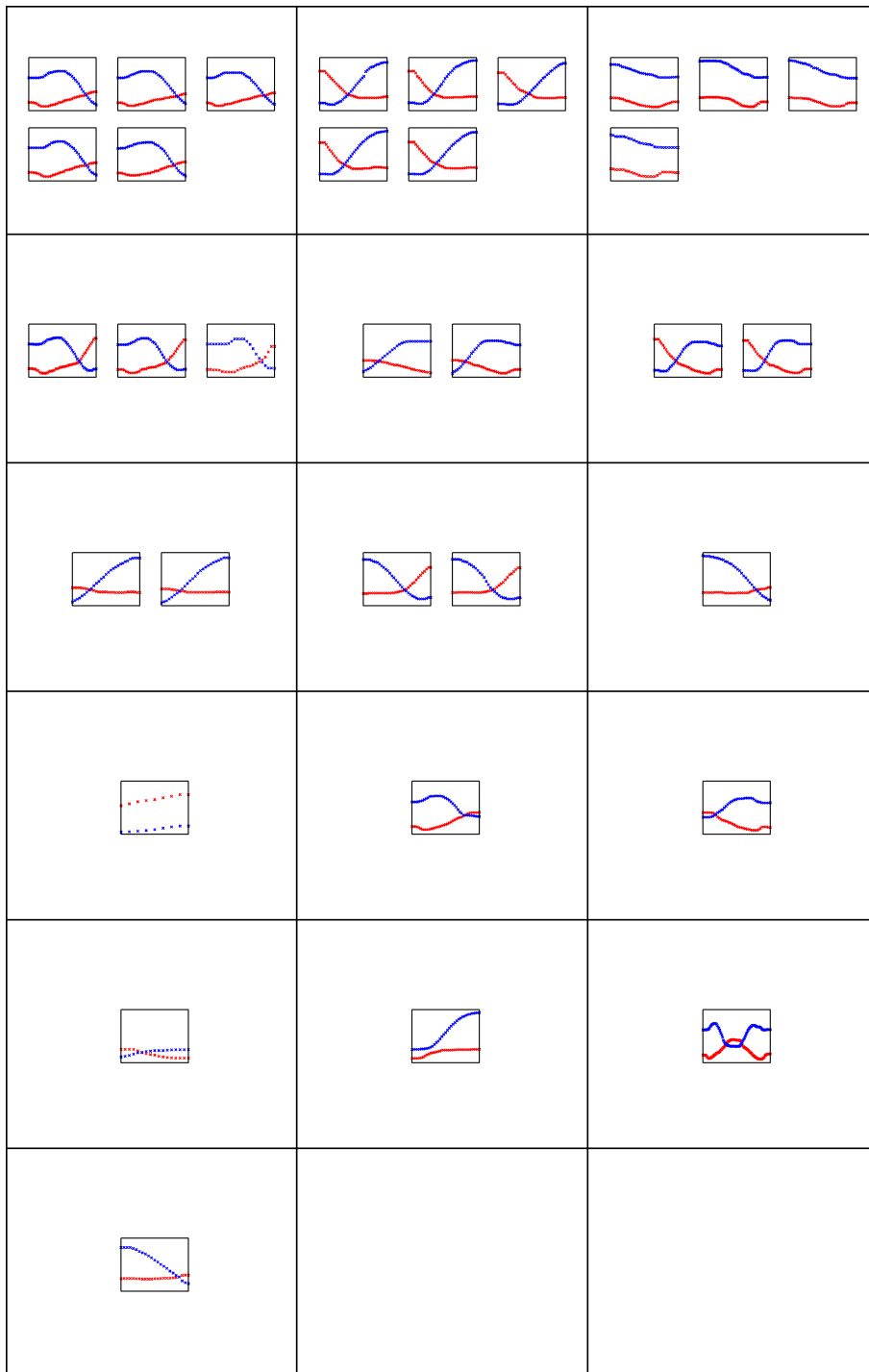
Figure 46: Graph Theoretic Clustering Output: movement clusters from DATA SET 1
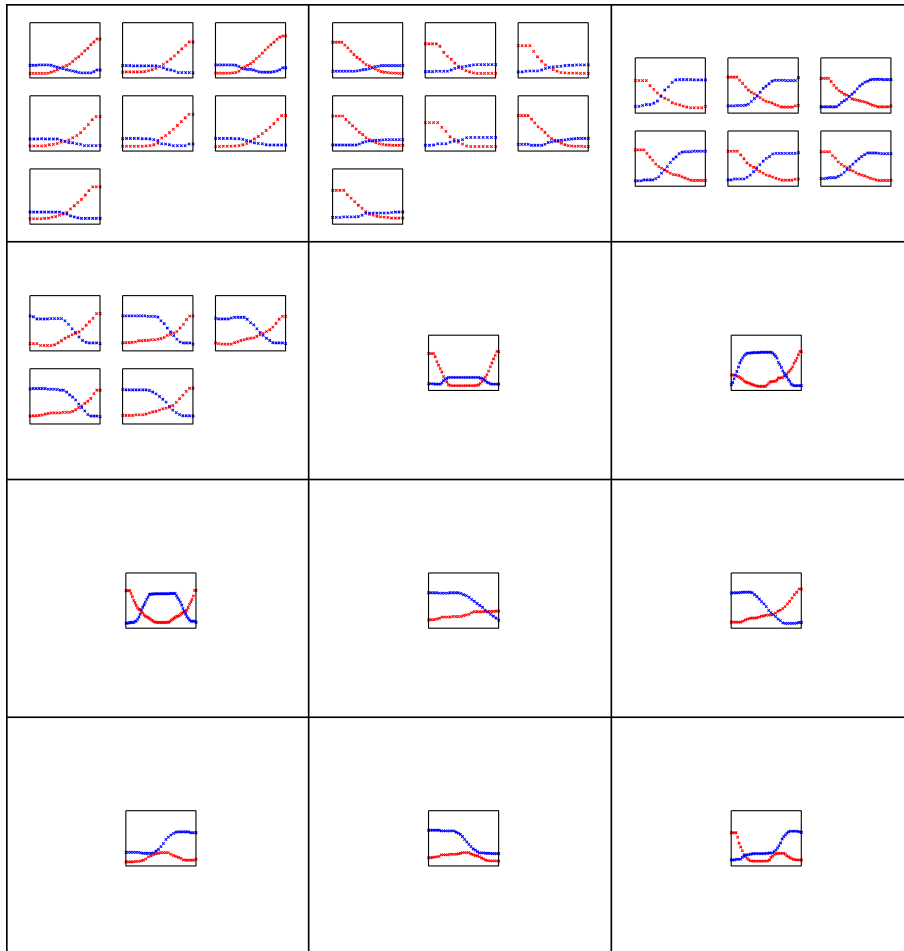
Figure 47: Graph Theoretic Clustering Output: movement clusters from DATA SET 2
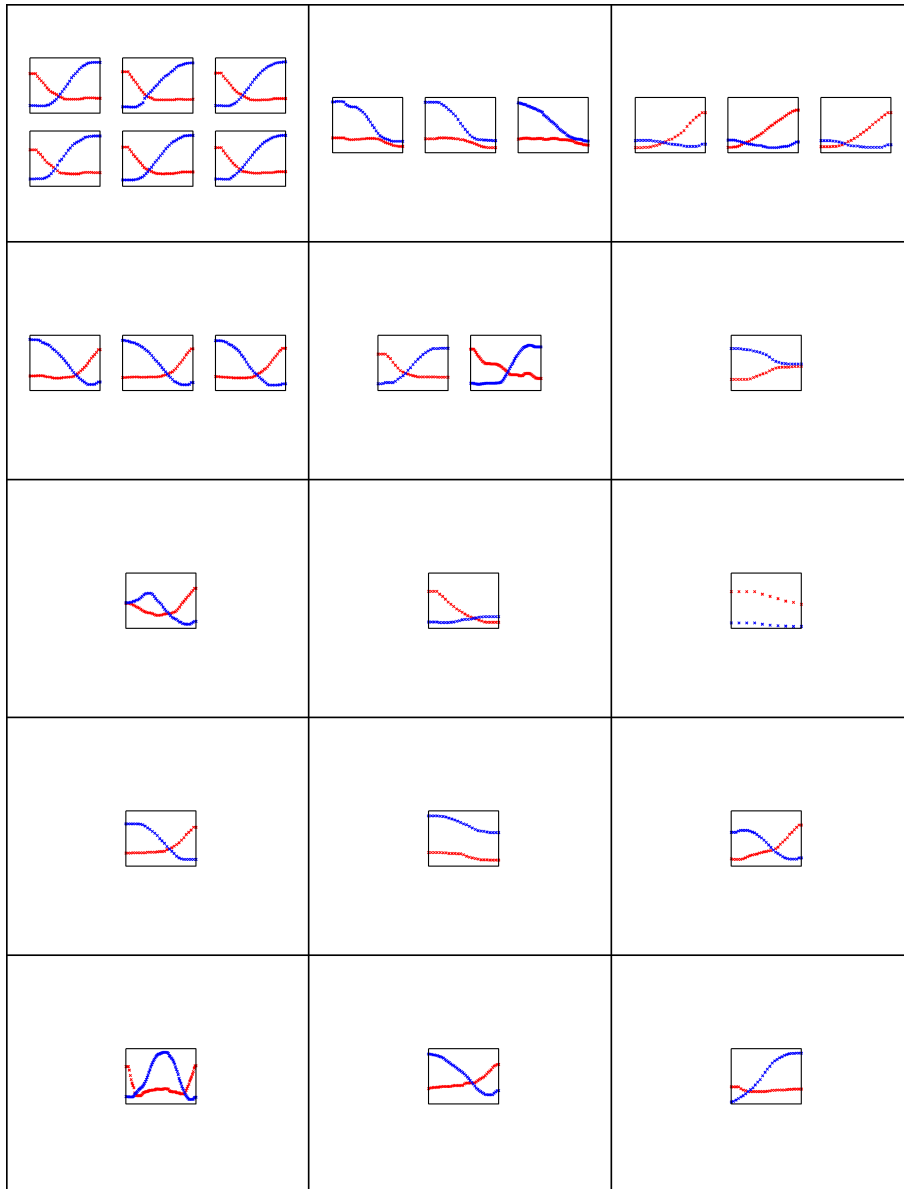
Figure 48: Graph Theoretic Clustering Output: movement clusters from DATA SET 3

Figure 49: Graph Theoretic Clustering Output: movement clusters from DATA
SET 4
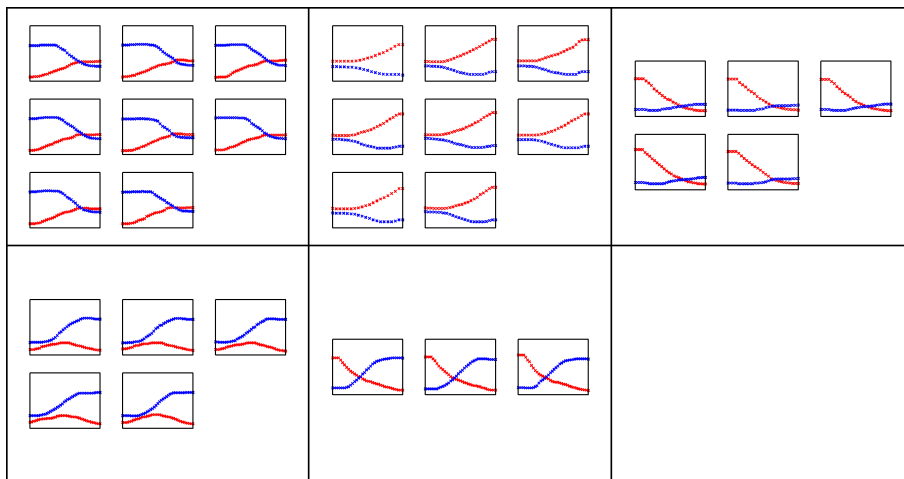
Figure 50: Graph Theoretic Clustering Output: movement clusters from DATA
SET 5
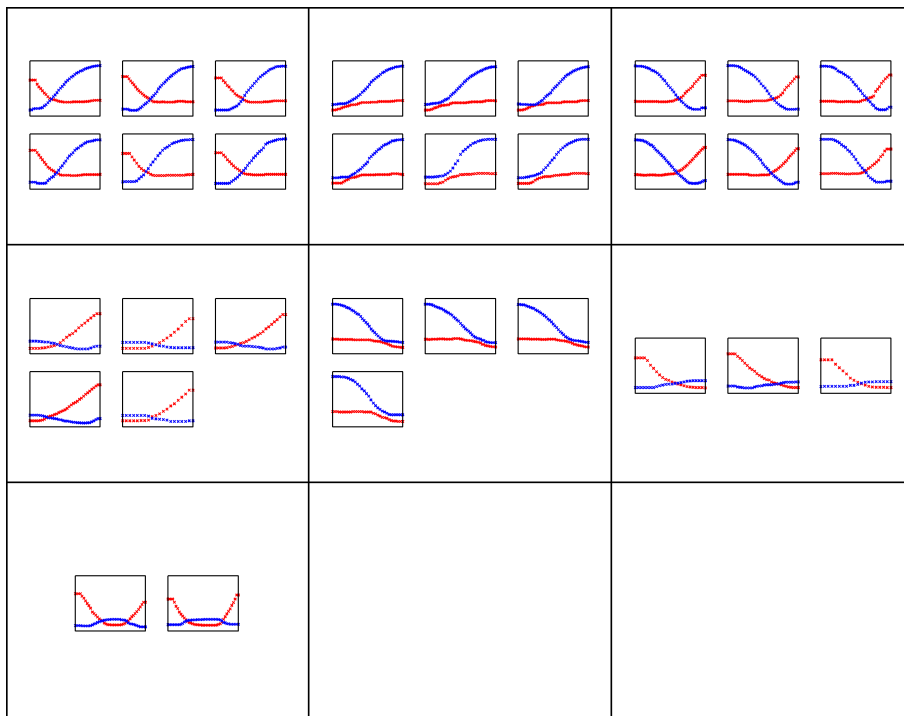
Figure 51: Graph Theoretic Clustering Output: movement clusters from DATA SET 6
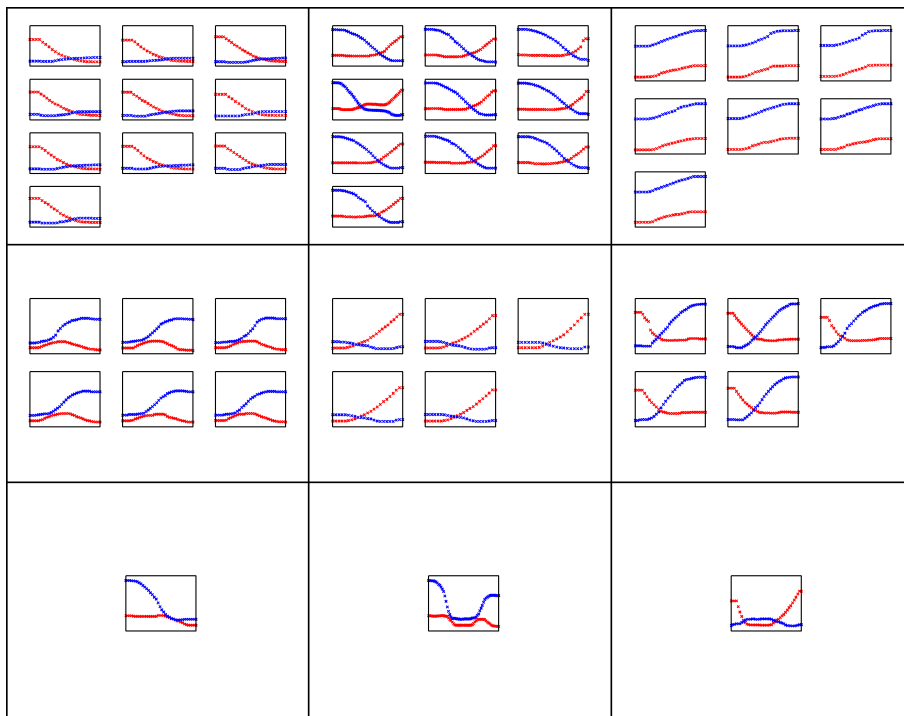
Figure 52: Graph Theoretic Clustering Output: movement clusters from DATA SET 7
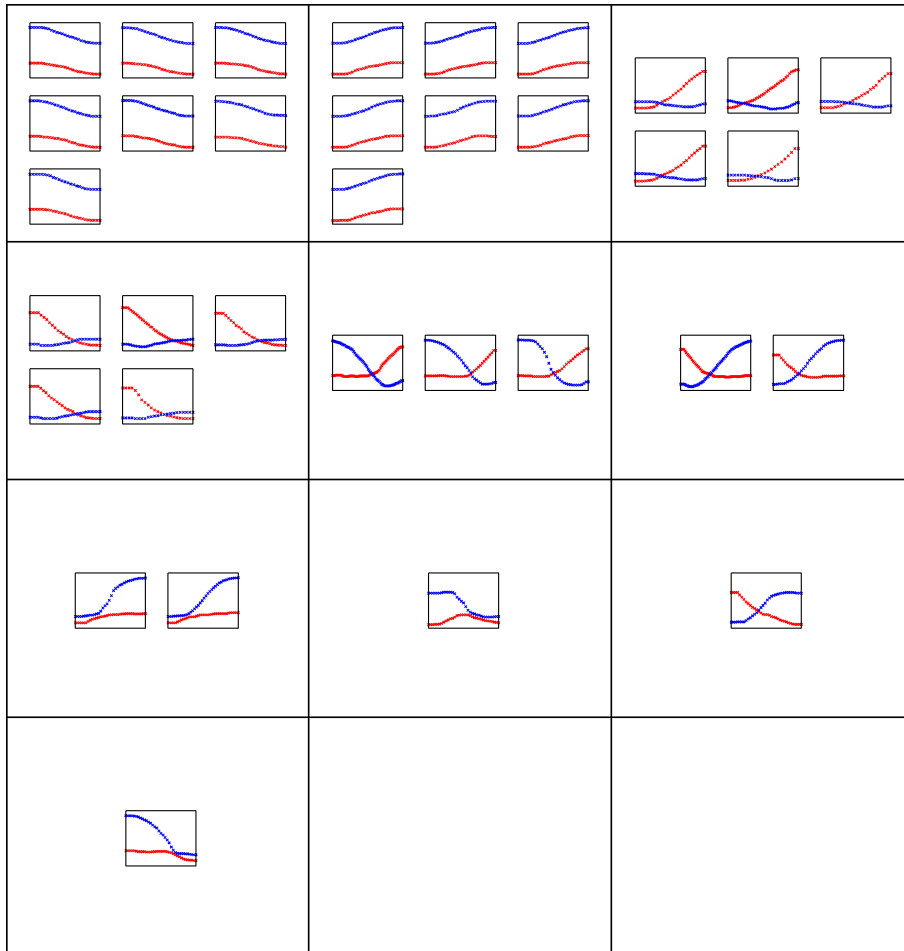
Figure 53: Graph Theoretic Clustering Output: movement clusters from DATA SET 8
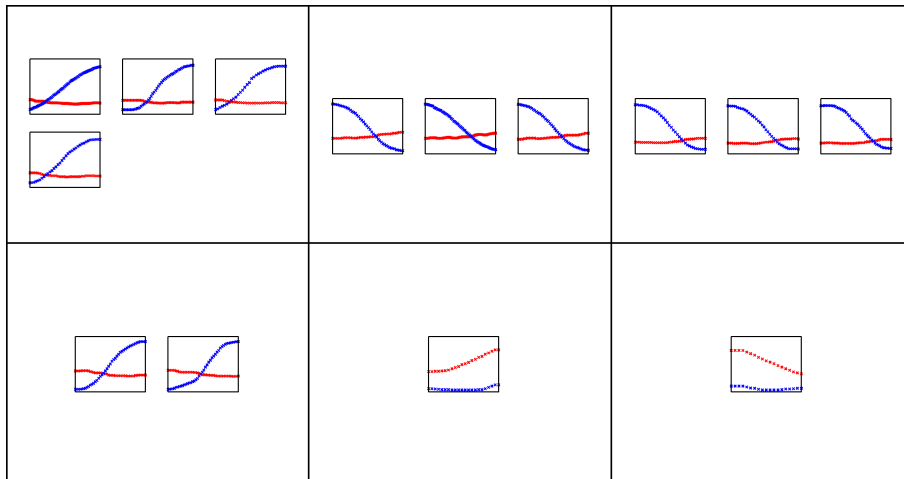
Figure 54: Graph Theoretic Clustering Output: movement clusters from DATA SET 9
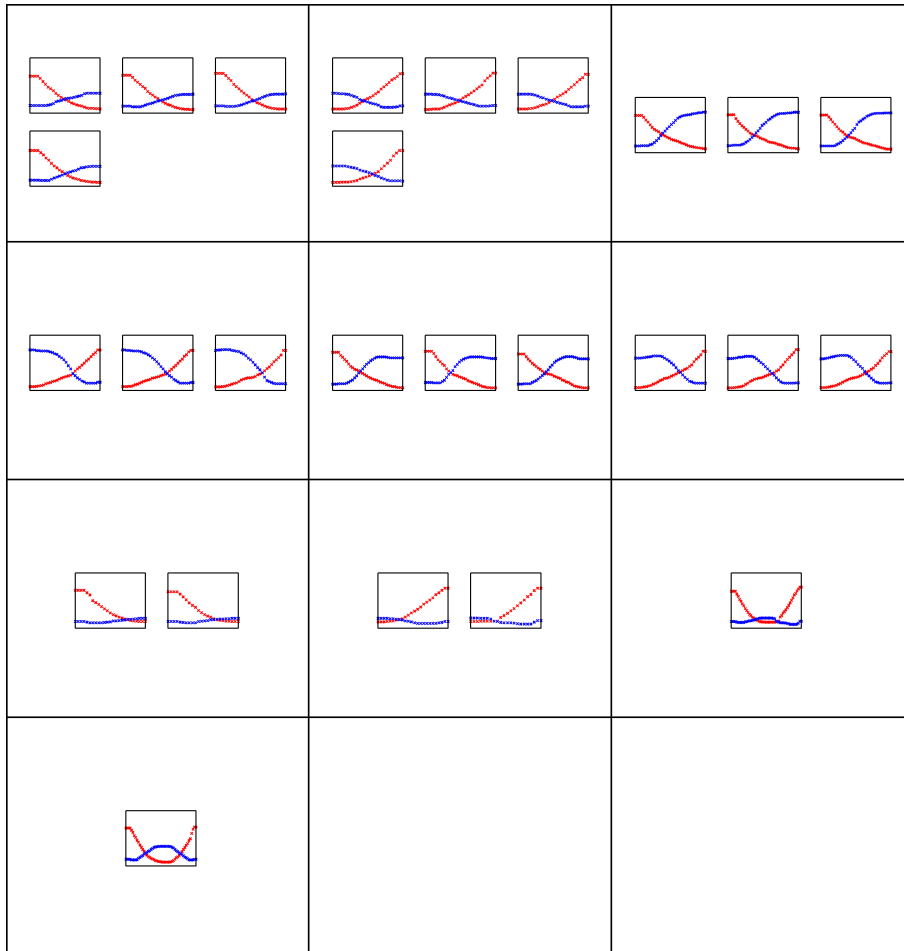
Figure 55: Graph Theoretic Clustering Output: movement clusters from DATA
SET 10
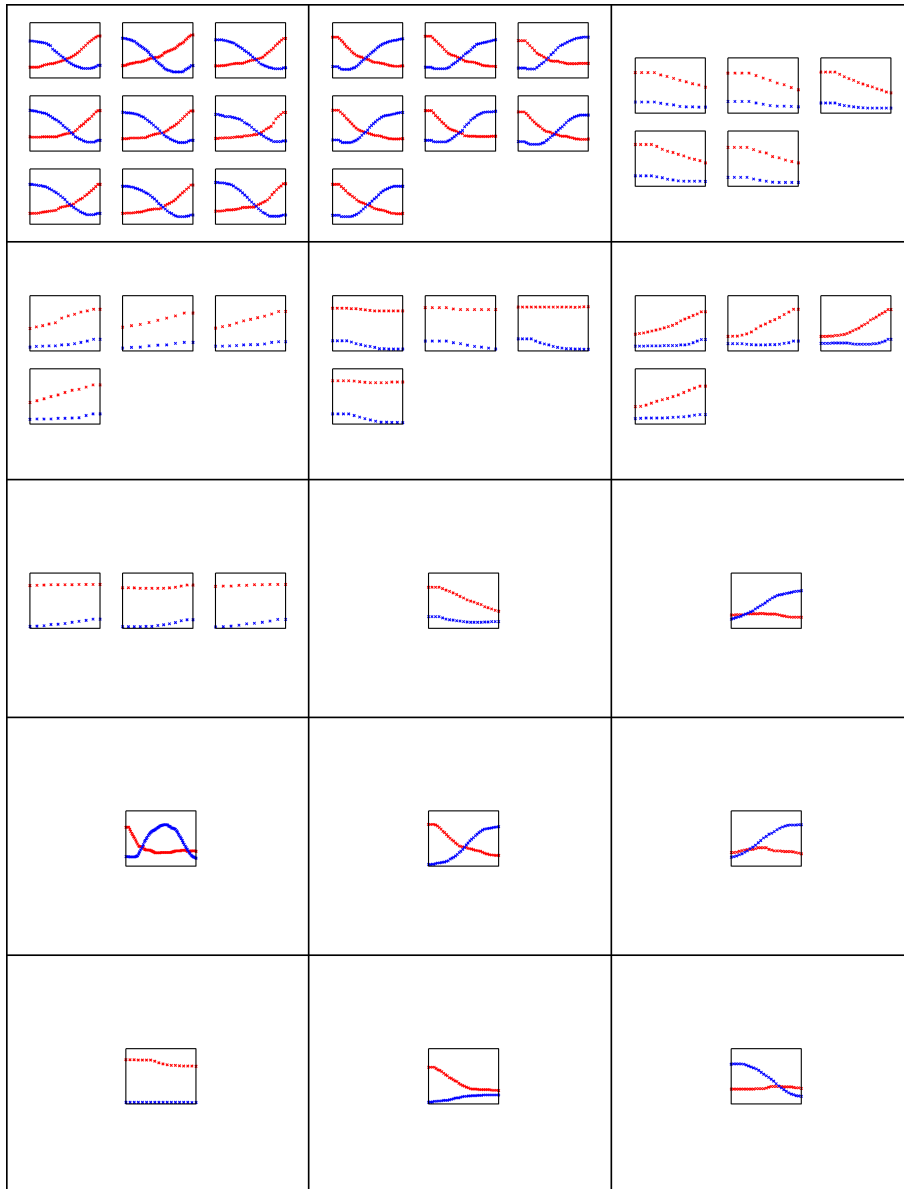
Figure 56: Graph Theoretic Clustering Output: movement clusters from DATA
SET 11
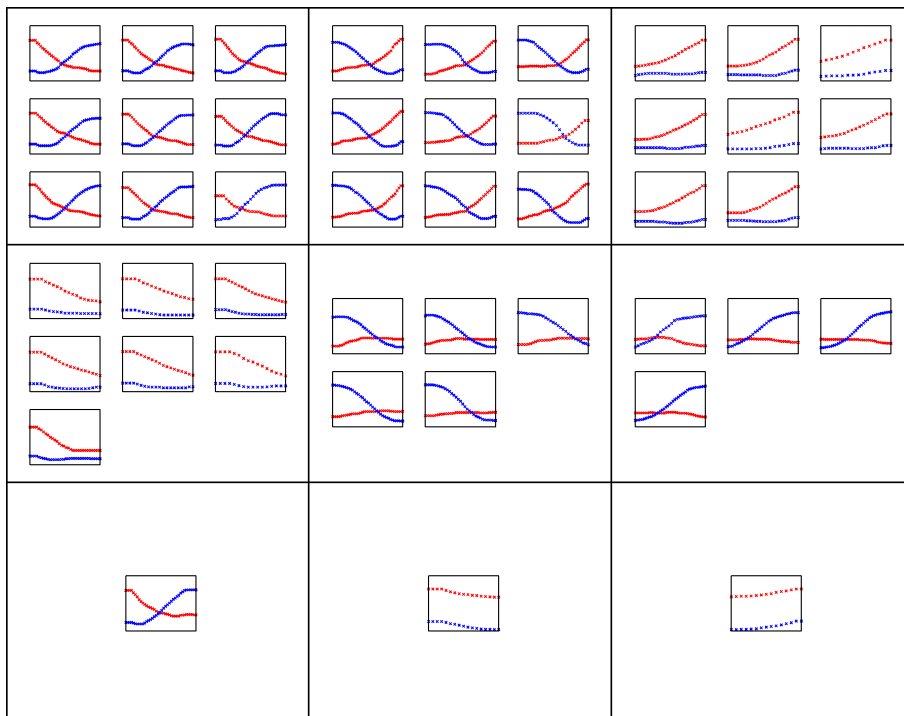
Figure 57: Graph Theoretic Clustering Output: movement clusters from DATA SET 12
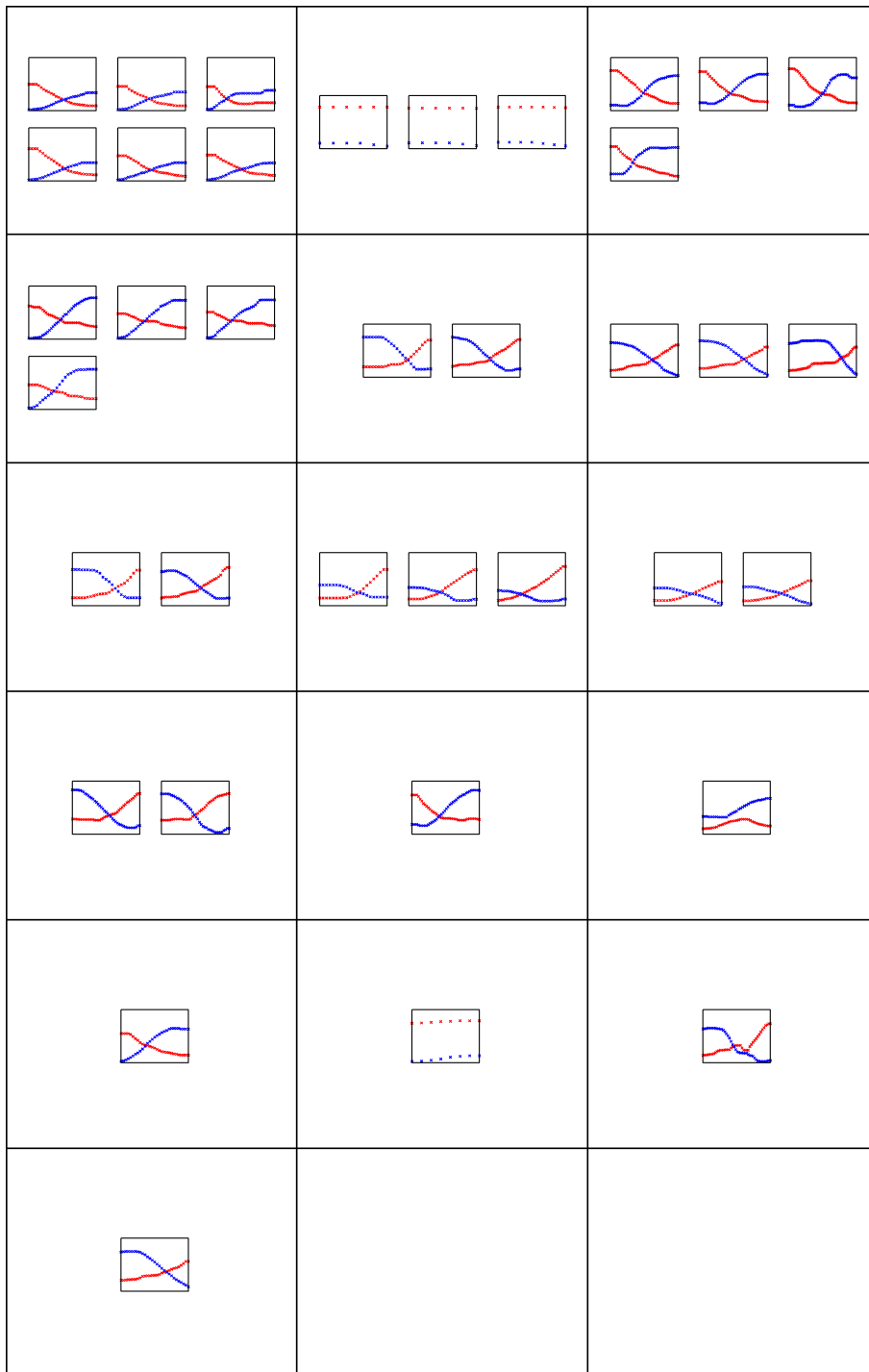
Figure 58: Graph Theoretic Clustering Output: movement clusters from DATA SET 13
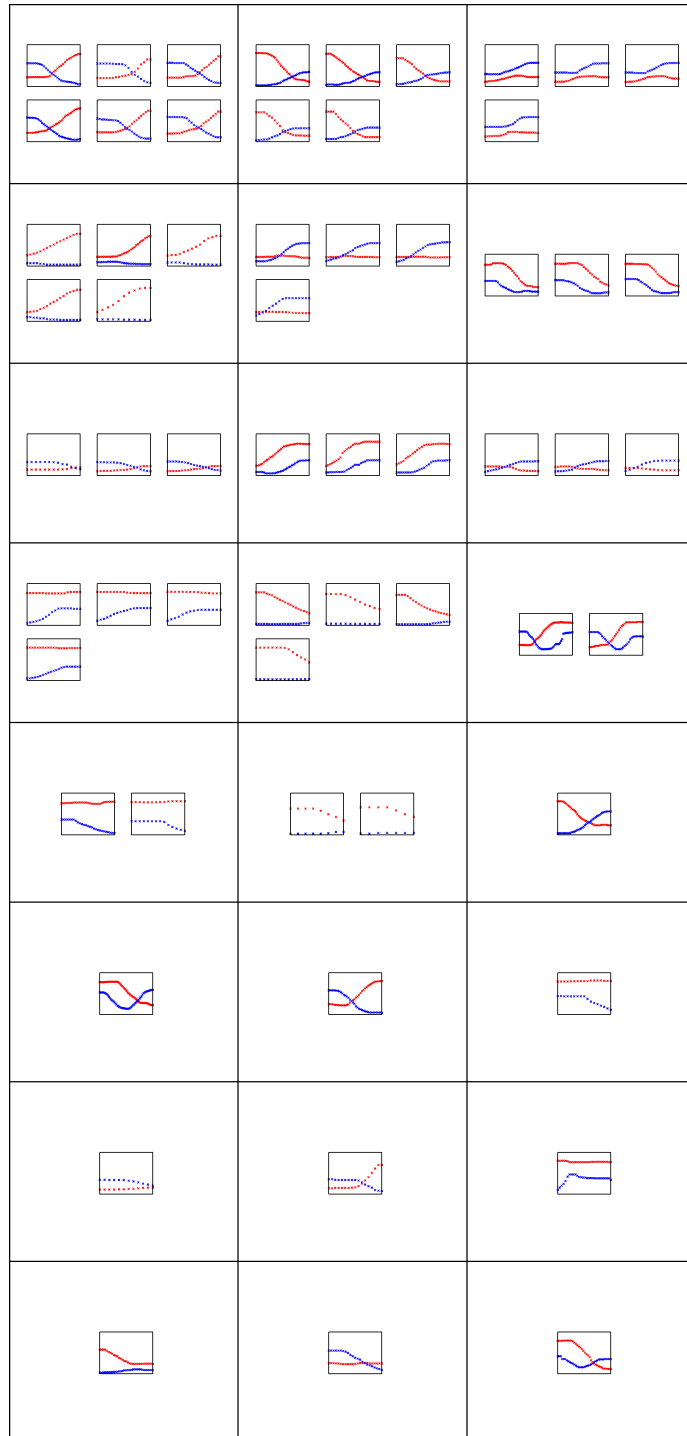
Figure 59: Graph Theoretic Clustering Output: movement clusters from DATA SET 14
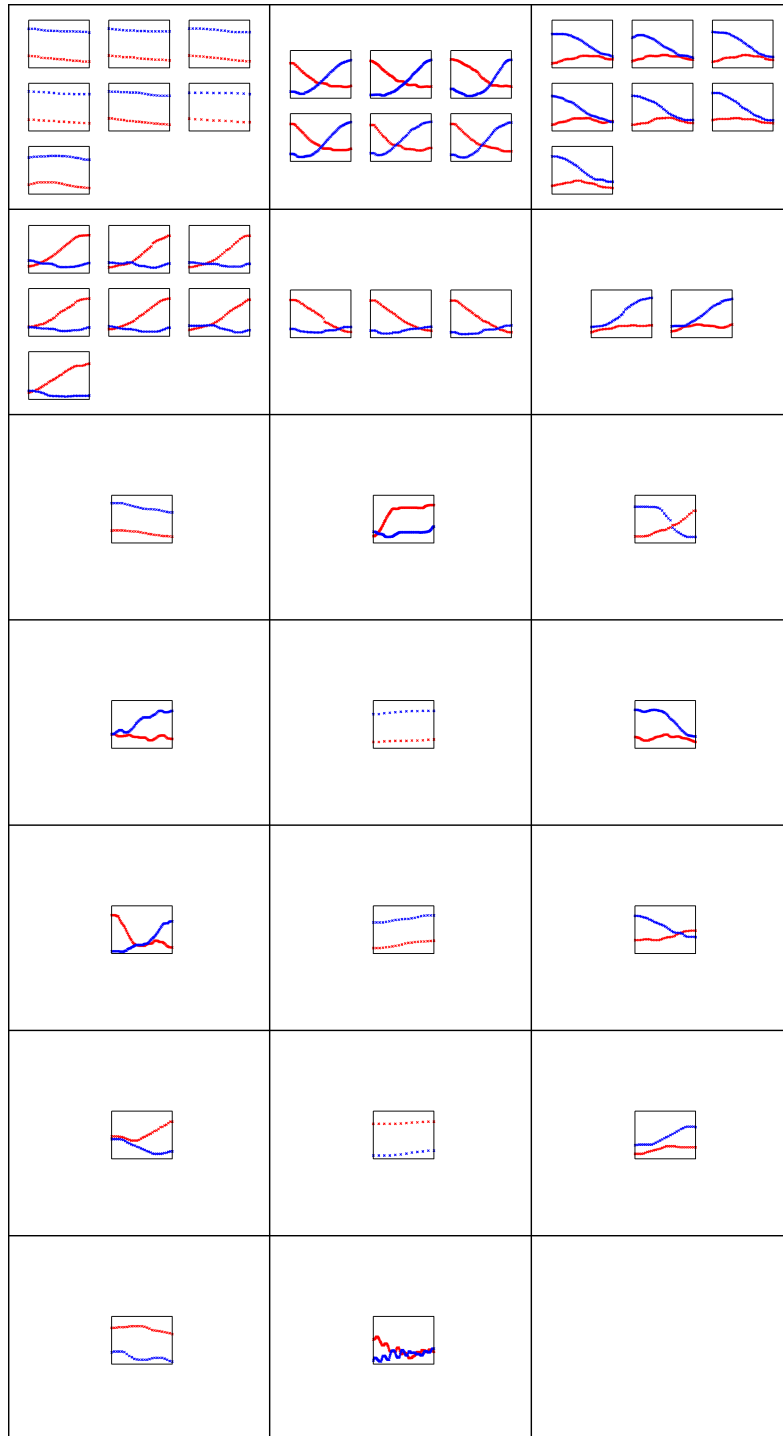
Figure 60: Graph Theoretic Clustering Output: movement clusters from DATA SET 15
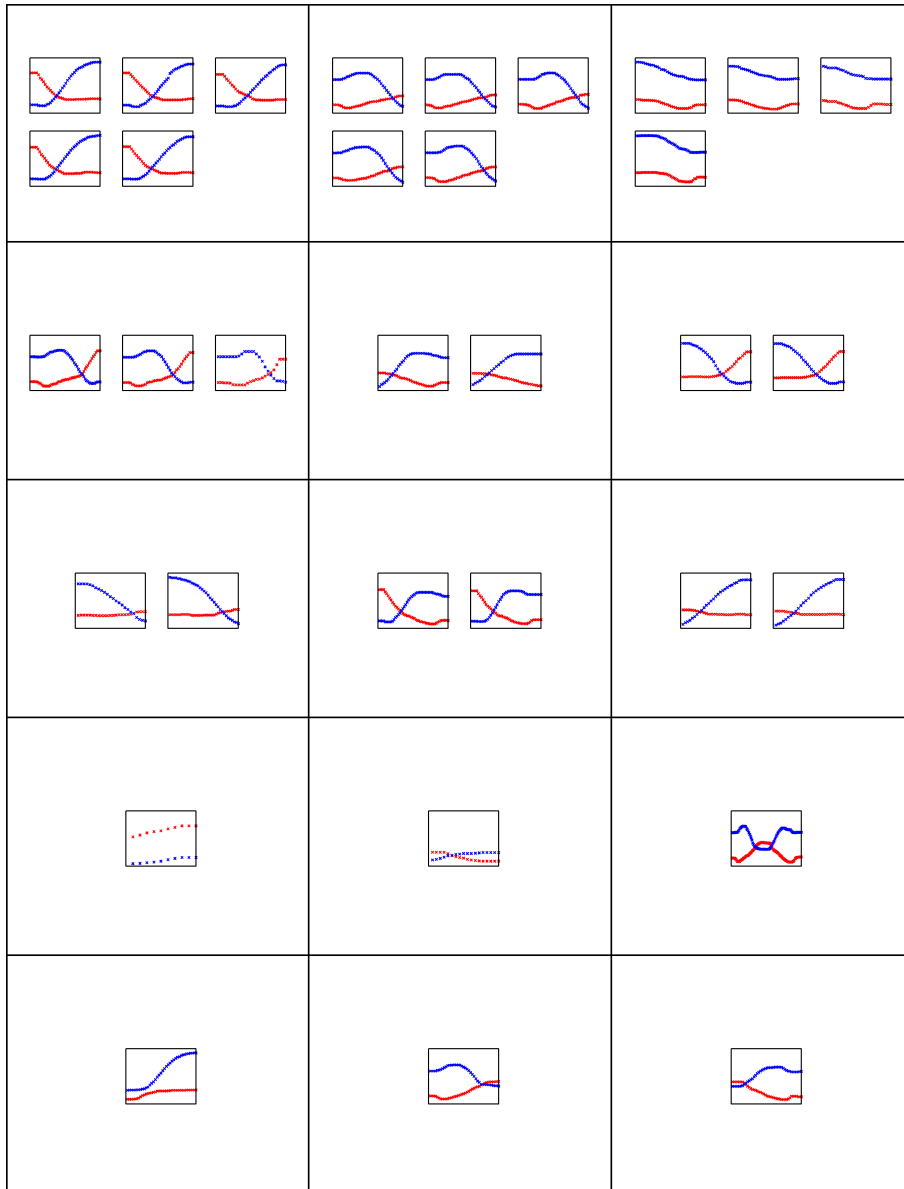
Figure 61: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 1
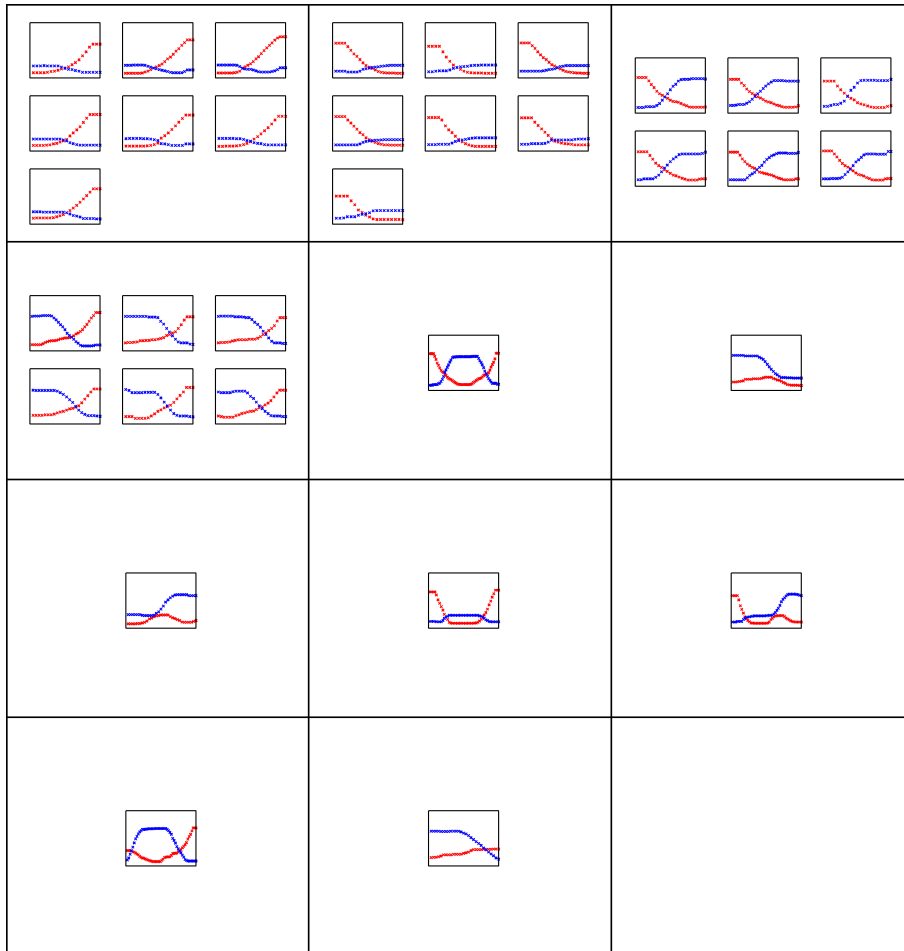
Figure 62: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 2

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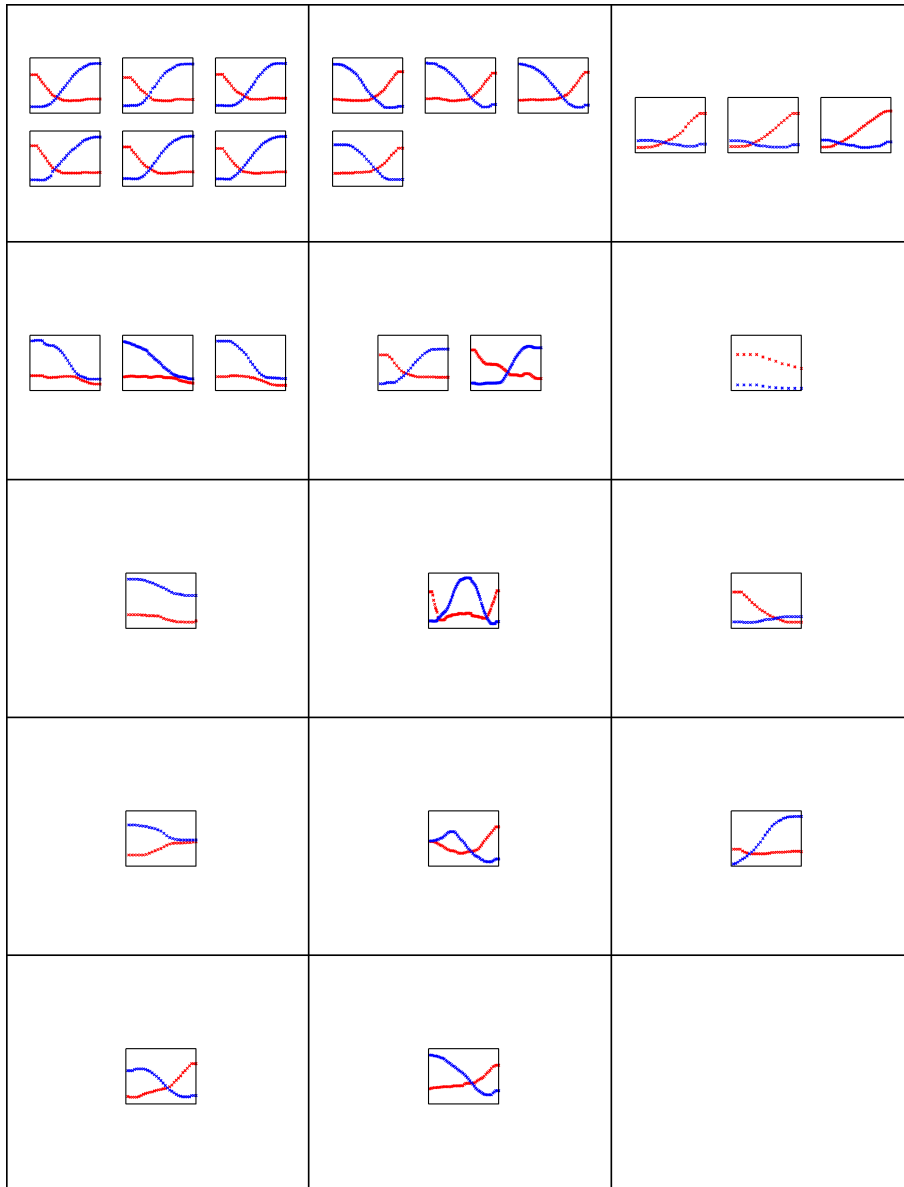
Figure 63: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 3
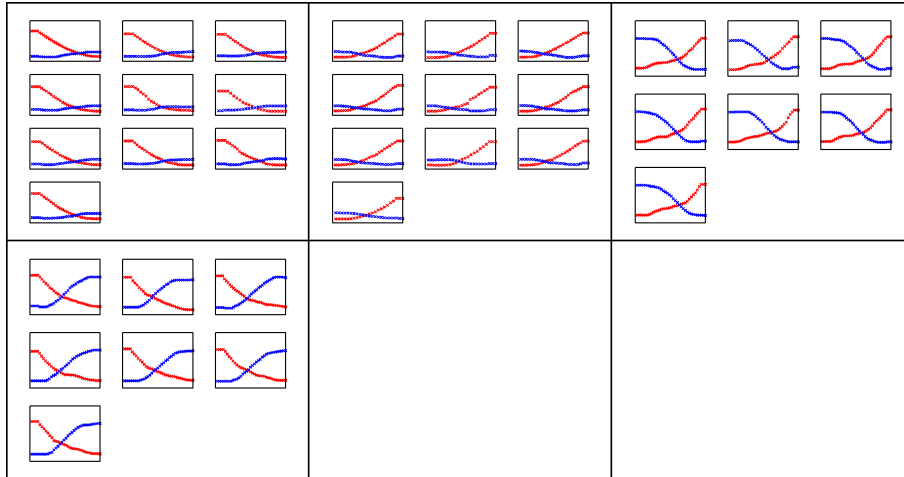
Figure 64: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 4
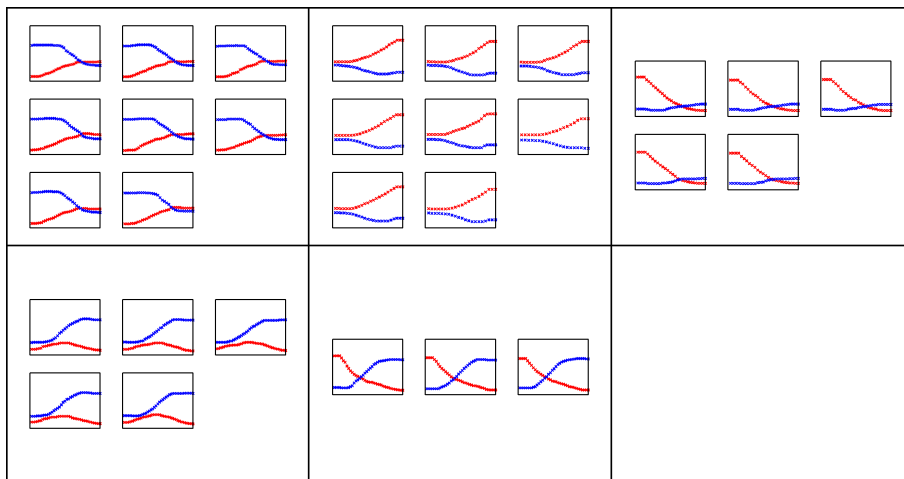
Figure 65: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 5
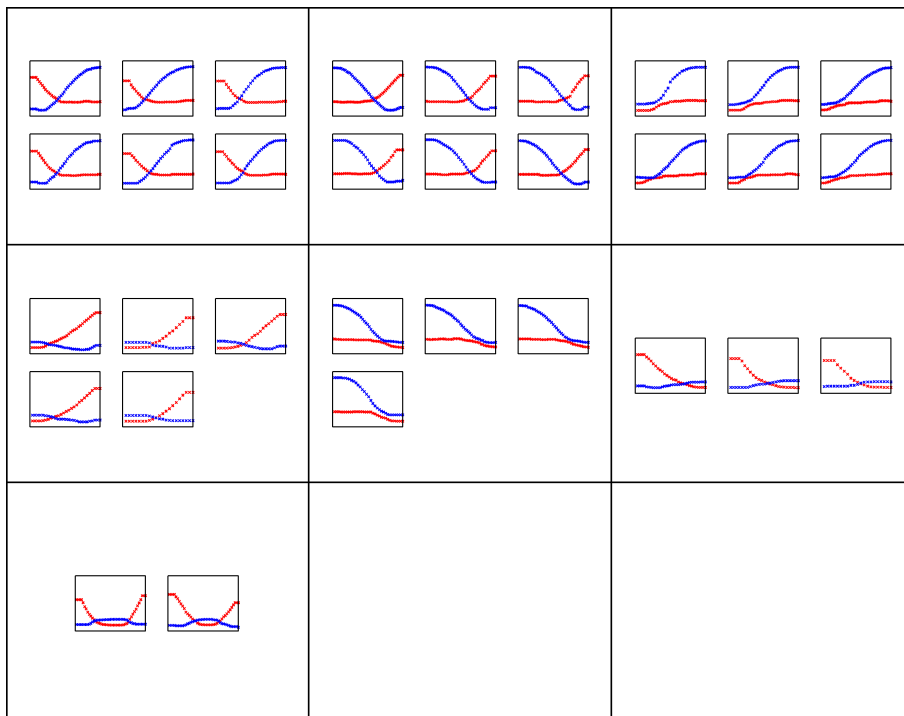
Figure 66: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 6
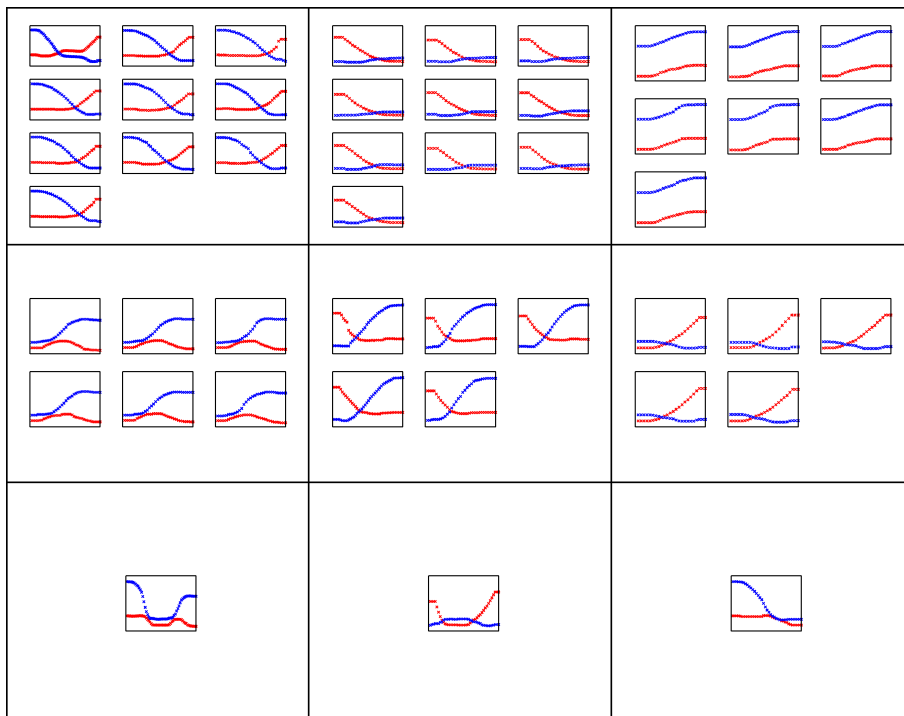
Figure 67: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 7
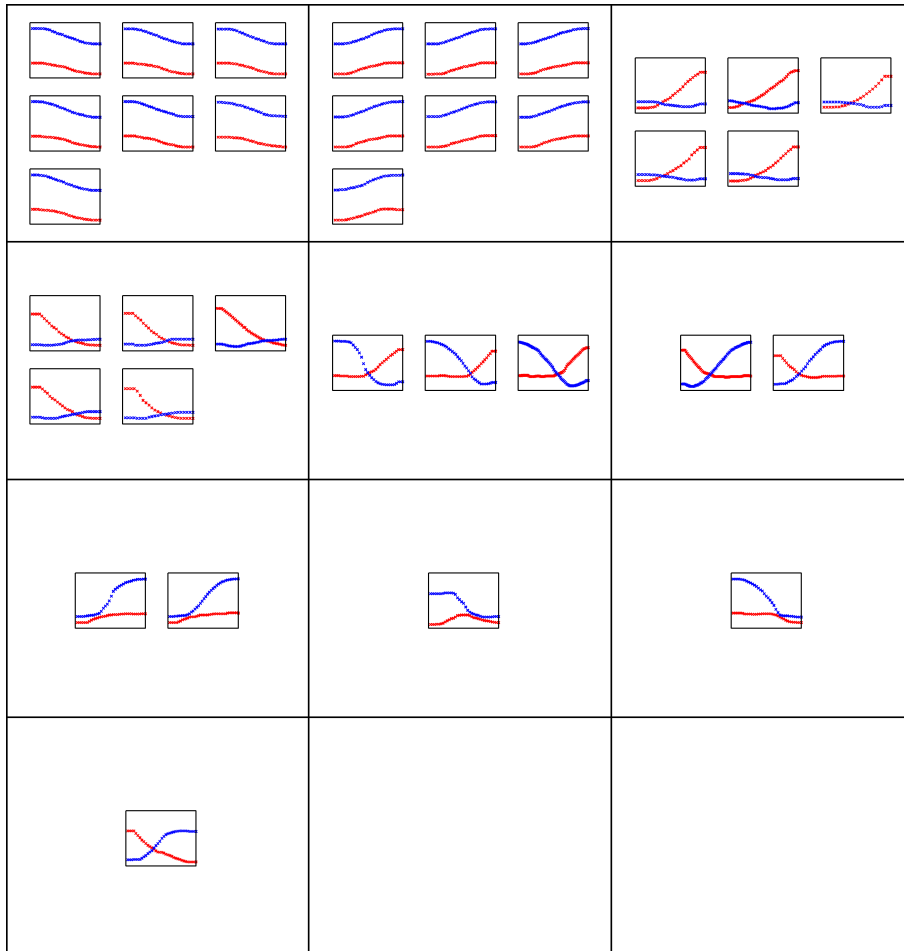
Figure 68: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 8
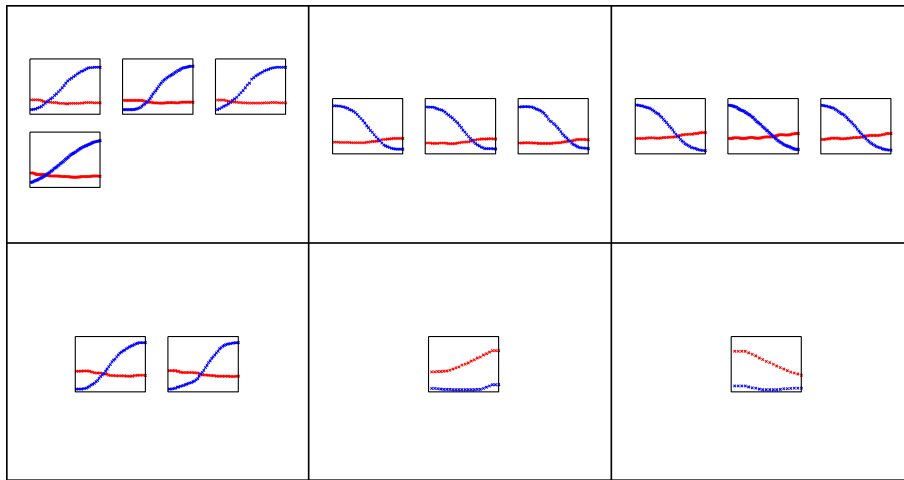
Figure 69: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 9
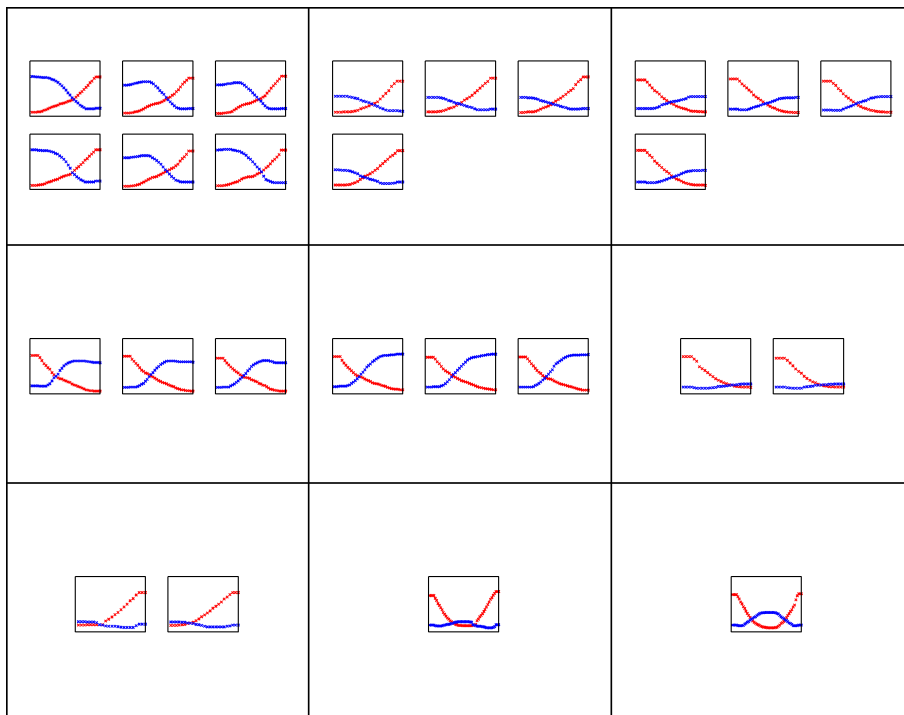
Figure 70: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 10

Figure 71: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 11
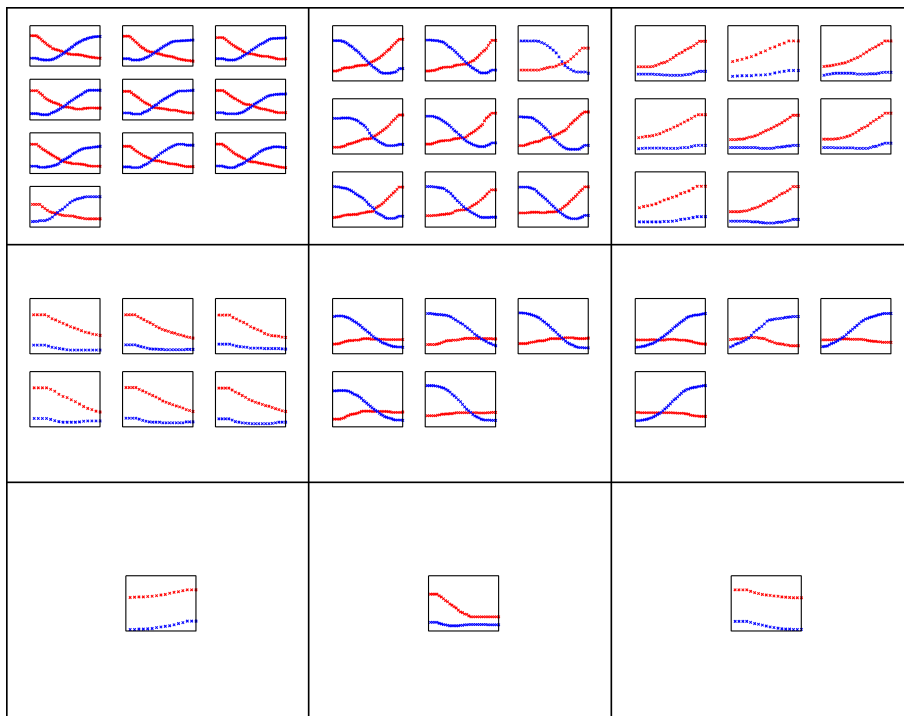
Figure 72: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 12
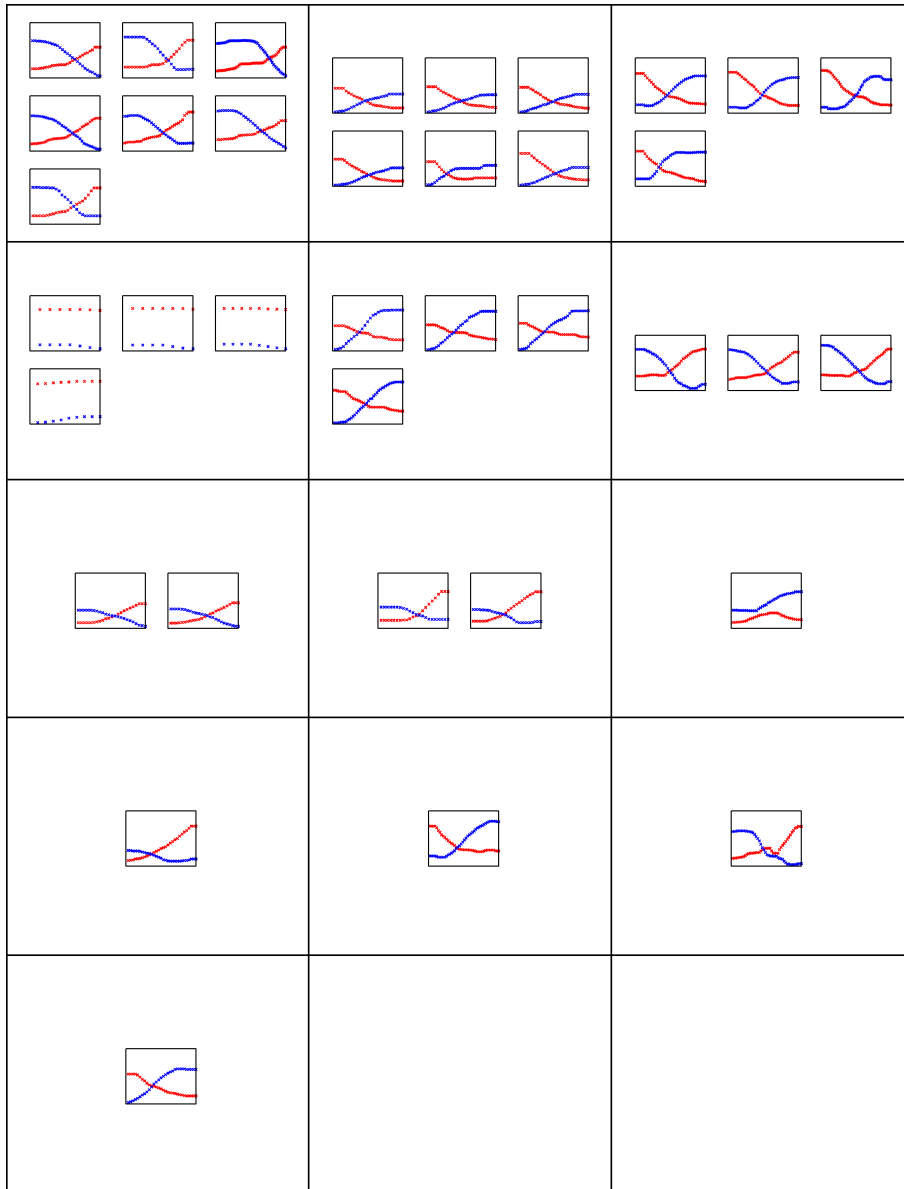
Figure 73: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 13
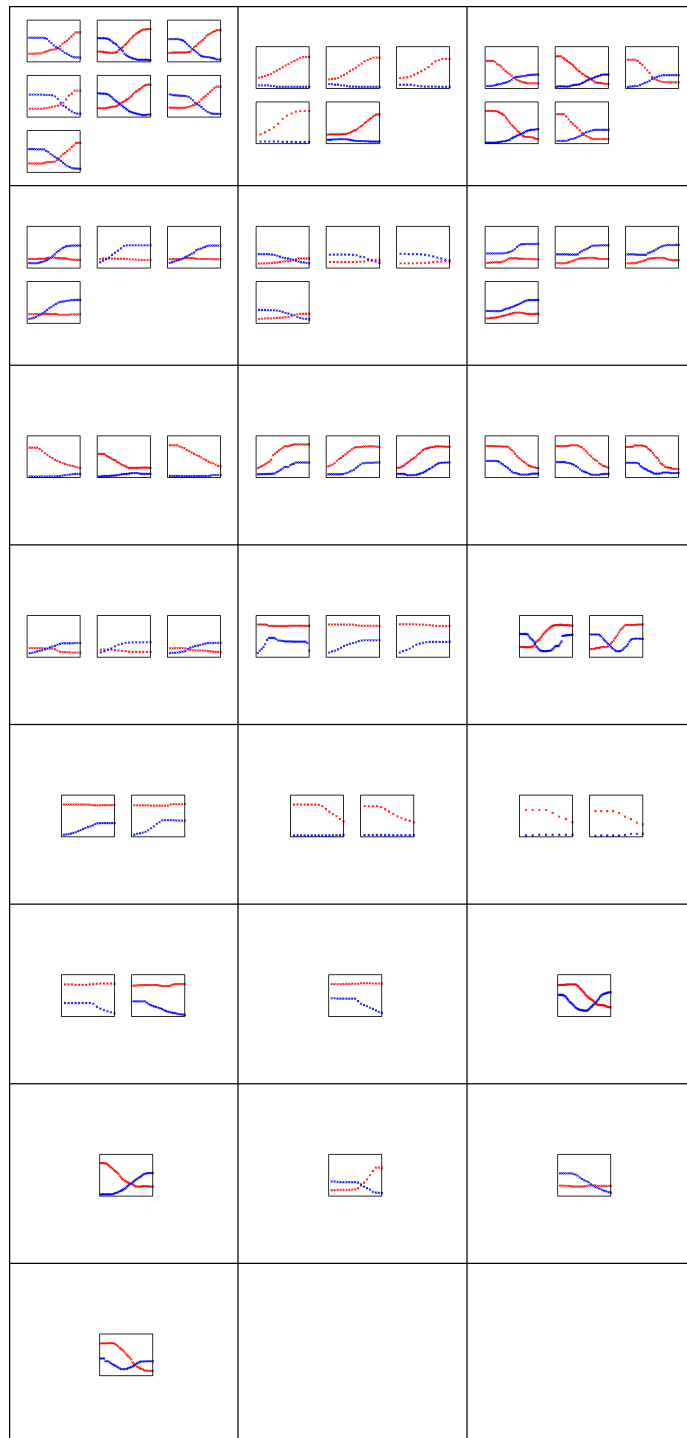
Figure 74: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 14

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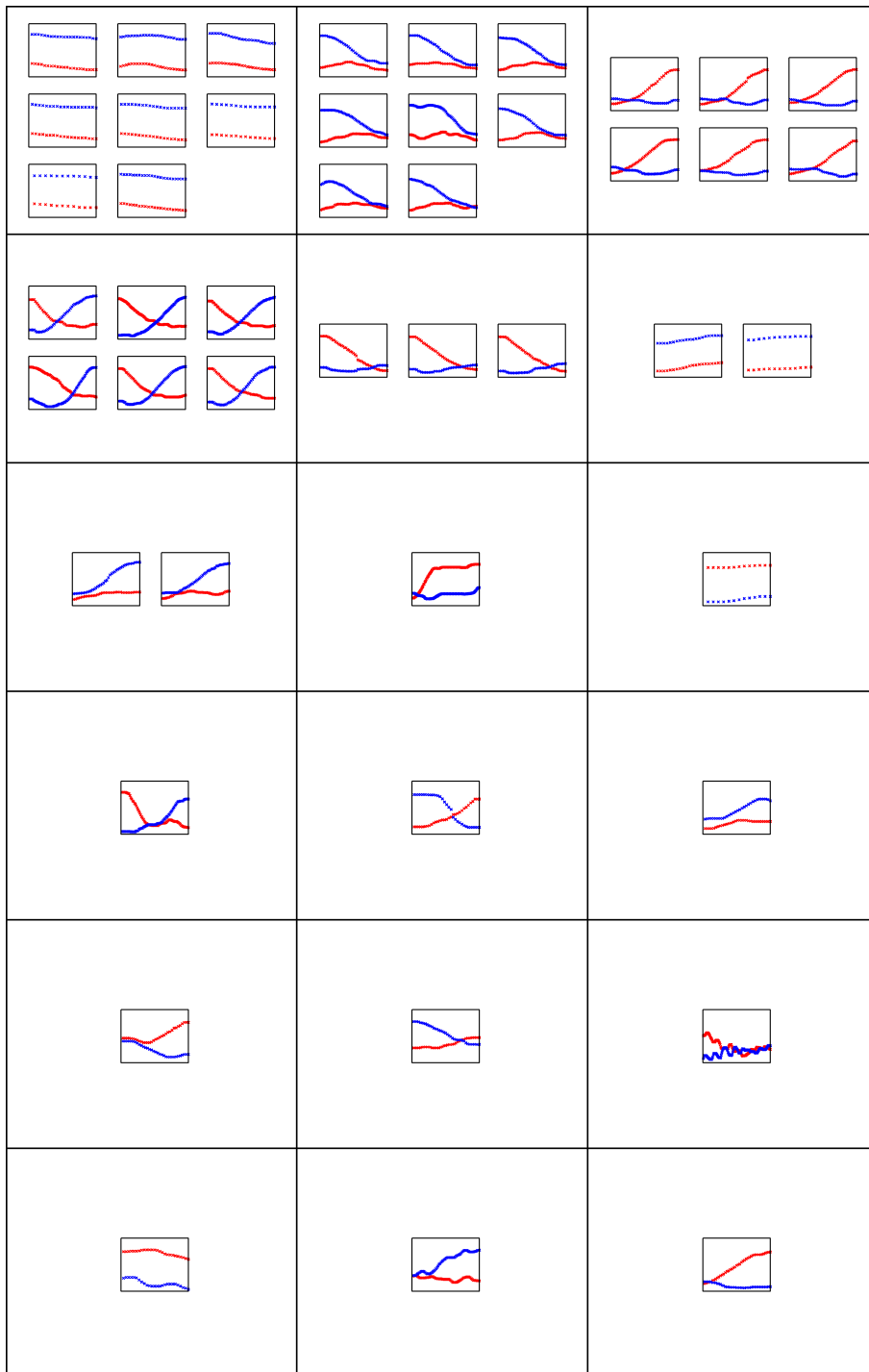
Figure 75: Batchelor & Wilkins' Clustering Output: movement clusters from DATA SET 15

Event Sequences

This document contains the various event sequences that were generated from the fifteen data sets after graph theoretical clustering had been performed. It is important to note that since each data set was processed separately, events of the same type over different data sets are not necessarily similar. In other words, event *A* in data set 1 is not necessarily the same event as event *A* in data set 2.

B C A A B B C A D A B F D A I E A C A D A J K E L A G C H B F G

The event sequence from DATA SET 1

C B C E B D A D A C B F G C B D A D A C H I B D A C B D A J A B

The event sequence from DATA SET 2

A C A C D C D A B A E F A B G D H A B A I J K L B A

The event sequence from DATA SET 3

A B A B A B A B C D A B A B A B C D C D C D A B C D A B C D A B C

The event sequence from DATA SET 4

C D A B C D A B C D A B C D A B C D A B E A B E A B E A

The event sequence from DATA SET 5

C A C A A C A C F D G B E B E B E B C F D A F D D A E B D G B

The event sequence from DATA SET 6

F B F B A D A E C G E C H C B D A E C B A E C B A D A D A D A E C B F B A D A E C B F B F

The event sequence from DATA SET 7

D G A B A B A B A B A H C D C F E F A B E D C D C I B A B J C D G

The event sequence from DATA SET 8

C C A B D B D B E F A A A

The event sequence from DATA SET 9

E F G C D C D C D B A H B A B A B A B A B A C D E

The event sequence from DATA SET 10

E F A B A E C B A G D D D E C B A C B A E C B B A E C D B A B A E F A D D C H C D D I

The event sequence from DATA SET 11

D C A B A E C D C A B A E C D F B A B D C A B D F B A E C F E C G H A B A E C F B A B D

The event sequence from DATA SET 12

D A B C F E A B C D A B G D B C D A B C F E A H D A B C E A A A B C I J K L D B M F E N O

The event sequence from DATA SET 13

E G B H A A C E A D A F D A C D A C C D A B D I B J B F E A B F E A E B

The event sequence from DATA SET 14

3

L K M F B A D I J F D H B E B A D C B K J F C G N E A F C B
D H B A E H C B C I D G A C G I O G P E J D C D B A G E A

The event sequence from DATA SET 15

Serial Episodes

This document contains the various serial episodes that were detected from the fifteen event sequences found in Appendix D.

Episode	No. Occurrences	Episode	No. Occurrences	Episode	No. Occurrences
A	9	B	5	C	4
D	3	E	2	F	2
G	2	H	2	I	1
J	1	K	1	L	1
AA	1	AB	2	AC	1
AD	2	AG	1	AI	1
AJ	1	BB	1	BC	2
BF	2	CA	3	CH	1
DA	3	EA	1	EL	1
FD	1	FG	1	GC	1
GH	1	HB	1	IE	1
JK	1	KE	1	LA	1
AAB	1	ABB	1	ABF	1
ACA	1	ADA	2	AGC	1
AIE	1	AJK	1	BBC	1
BCA	2	BFD	1	BFG	1
CAA	1	CAD	2	CHB	1
DAB	1	DAI	1	DAJ	1
EAC	1	ELA	1	FDA	1
FGH	1	GCH	1	HBF	1
IEA	1	JKE	1	KEL	1
LAG	1				
AABB	1	ABBC	1	ABFD	1
ACAD	1	ADAB	1	ADAJ	1
AGCH	1	AIEA	1	AJKE	1
BBCA	1	BCAA	1	BCAD	1
BFDA	1	BFGH	1	CAAB	1
CADA	2	CHBF	1	DABF	1
DAIE	1	DAJK	1	EACA	1
ELAG	1	FDAI	1	GCHB	1
HBFG	1	IEAC	1	JKEL	1
KELA	1	LAGC	1		

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Table 1: Various frequent serial episodes for DATA SET 1

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	7		B	7		C	7
D	6		E	1		F	1
G	1		H	1		I	1
J	1		K	1		L	1
AB	1		AC	3		AD	2
AJ	1		BC	2		BD	4
BF	1		CB	4		CE	1
CH	1		DA	6		EB	1
FG	1		GC	1		HI	1
IB	1		JA	1			
ABC	1		ACB	2		ACH	1
ADA	2		AJA	1		BCE	1
BDA	4		BFG	1		CBC	1
CBD	2		CBF	1		CEB	1
CHI	1		DAC	3		DAD	2
DAJ	1		EBD	1		FGC	1
GCB	1		HIB	1		IBD	1
JAB	1						
ACBD	1		ACBF	1		ACHI	1
ADAC	2		AJAB	1		BCEB	1
BDAC	1		BDAD	2		BDAJ	1
BFGC	1		CBCE	1		CBDA	2
CBFG	1		CEBD	1		CHIB	1
DACB	2		DACH	1		DADA	2
DAJA	1		EBDA	1		FGCB	1
GCBD	1		HIBD	1		IBDA	1
JABC	1						

Table 2: Various frequent serial episodes for DATA SET 2

Episode	No. Occurrences	Episode	No. Occurrences	Episode	No. Occurrences
A	8	B	4	C	3
D	3	E	1	F	1
G	1	H	1	I	1
J	1	K	1	L	1
M	1				
AB	3	AC	2	AE	1
AI	1	AM	1	BA	3
BG	1	CA	1	CD	2
DA	1	DC	1	DH	1
EF	1	FA	1	GD	1
HA	1	IJ	1	JK	1
KL	1	LB	1		
ABA	2	ABG	1	ACA	1
ACD	1	AEF	1	AIJ	1
BAE	1	BAI	1	BAM	1
BGD	1	CAC	1	CDA	1
CDC	1	DAB	1	DCD	1
DHA	1	EFA	1	FAB	1
GDH	1	HAB	1	IJK	1
JKL	1	KLB	1	LBA	1
ABAE	1	ABAI	1	ABGD	1
ACAC	1	ACDC	1	AEFA	1
AIJK	1	BAEF	1	BAIJ	1
BGDH	1	CACD	1	CDAB	1
CDCD	1	DABA	1	DCDA	1
DHAB	1	EFAB	1	FABG	1
GDHA	1	HABA	1	IJKL	1
JKLB	1	KLBA	1	LBAM	1

Table 3: Various frequent serial episodes for DATA SET 3

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	10		B	10		C	7
D	7		E	1		F	1
G	1		H	1		I	1
J	1		K	1		L	1
M	1						
AB	10		BA	5		BC	5
CD	7		DA	4		DC	2
ABA	5		ABC	5		BAB	5
BCD	5		CDA	4		CDC	2
DAB	4		DCD	2			
ABAB	5		ABCD	5		BABA	3
BABC	2		BCDA	3		BCDC	1
CDAB	4		CDCD	2		DABA	1
DABC	3		DCDA	1		DCDC	1

Table 4: Various frequent serial episodes for DATA SET 4

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	8		B	8		C	5
D	5		E	3		F	1
G	1		H	1		I	1
J	1		K	1		L	1
M	1						
AB	8		BC	4		BE	3
CD	5		DA	5		EA	3
ABC	4		ABE	3		BCD	4
BEA	3		CDA	5		DAB	5
EAB	3						
ABCD	4		ABEA	3		BCDA	4
BEAB	3		CDAB	5		DABC	4
DABE	1		EABE	2			

Table 5: Various frequent serial episodes for DATA SET 5

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	6		B	6		C	6
D	5		E	4		F	3
G	2		H	1		I	1
J	1		K	1		L	1
M	1						
AA	1		AC	3		AE	1
AF	1		BC	2		BD	1
BE	3		CA	3		CF	2
DA	2		DD	1		DG	2
EB	4		FD	3		GB	2
AAC	1		ACA	2		ACF	1
AEB	1		AFD	1		BCF	1
BDG	1		BEB	3		CAA	1
CAC	2		CFD	2		DAE	1
DAF	1		DDA	1		DGB	2
EBC	1		EBD	1		EBE	2
FDA	1		FDD	1		FDG	1
GBC	1		GBE	1			
AACA	1		ACAA	1		ACAC	1
ACFD	1		AEBD	1		AFDD	1
BCFD	1		BDGB	1		BEBC	1
BEBE	2		CAAC	1		CACA	1
CACF	1		CFDA	1		CFDG	1
DAEB	1		DAFD	1		DDAE	1
DGBC	1		DGBE	1		EBCF	1
EBDG	1		EBEB	2		FDAF	1
FDDA	1		FDGB	1		GBEB	1

Table 6: Various frequent serial episodes for DATA SET 6

Episode	No. Occurrences	Episode	No. Occurrences	Episode	No. Occurrences
A	10	B	10	C	7
D	6	E	6	F	5
G	1	H	1	I	1
J	1	K	1	L	1
M	1				
AD	5	AE	5	BA	4
BD	1	BF	4	CB	5
CG	1	CH	1	DA	6
EC	6	FB	5	GE	1
HC	1				
ADA	5	AEC	5	BAD	3
BAE	1	BDA	1	BFB	4
CBA	2	CBD	1	CBF	2
CGE	1	CHC	1	DAD	2
DAE	4	ECB	4	ECG	1
ECH	1	FBA	2	FBF	2
GEC	1	HCB	1		
ADAD	2	ADAE	3	AECB	4
AECG	1	BADA	3	BAEC	1
BDAE	1	BFBA	2	BFBF	1
CBAD	1	CBAE	1	CBDA	1
CBFB	2	CGEC	1	CHCB	1
DADA	2	DAEC	4	ECBA	2
ECBF	2	ECGE	1	ECHC	1
FBAD	2	FBFB	2	GECH	1
HCBD	1				

Table 7: Various frequent serial episodes for DATA SET 7

Episode	No. Occurrences	Episode	No. Occurrences	Episode	No. Occurrences
A	7	B	7	C	5
D	5	E	3	F	2
G	2	H	1	I	1
J	1	K	1	L	1
M	1				
AB	6	AH	1	BA	5
BE	1	BJ	1	CD	3
CF	1	CI	1	DC	3
DG	2	ED	1	EF	1
FA	1	FE	1	GA	1
GE	1	HC	1	IB	1
JC	1				
ABA	4	ABE	1	ABJ	1
AHC	1	BAB	4	BAH	1
BED	1	BJC	1	CDC	2
CDG	1	CFE	1	CIB	1
DCD	1	DCF	1	DCI	1
DGA	1	DGE	1	EDC	1
EFA	1	FAB	1	FEF	1
GAB	1	HCD	1	IBA	1
JCD	1				
ABAB	3	ABAH	1	ABED	1
ABJC	1	AHCD	1	BABA	3
BABJ	1	BAHC	1	BEDC	1
BJCD	1	CDCF	1	CDCI	1
CDGE	1	CFEF	1	CIBA	1
DCDC	1	DCFE	1	DCIB	1
DGAB	1	EDCD	1	EFAB	1
FABE	1	FEFA	1	GABA	1
HCDC	1	IBAB	1	JCDG	1

Table 8: Various frequent serial episodes for DATA SET 8

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	4		B	3		C	3
D	2		E	1		F	1
G	2		H	1		I	1
J	1		K	1		L	1
M	1						
AA	2		AB	1		AC	1
BD	2		BE	1		CA	1
CC	1		DB	2		EF	1
FA	1						
AAA	1		AAC	1		ABD	1
BDB	2		BEF	1		CAB	1
CCA	1		DBD	1		DBE	1
EFA	1		FAA	1			
AAAC	1		ABDB	1		BDBD	1
BDBE	1		BEFA	1		CABD	1
CCAB	1		DBDB	1		DBEF	1
EFAA	1		FAAA	1			

Table 9: Various frequent serial episodes for DATA SET 9

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	6		B	6		C	4
D	4		E	2		F	2
G	1		H	1		I	1
J	1		K	1		L	1
M	1						
AB	4		AC	1		AH	1
BA	6		CD	4		DB	1
DC	2		DE	1		EF	2
FG	1		GC	1		HB	1
ABA	4		ACD	1		AHB	1
BAB	4		BAC	1		BAH	1
CDB	1		CDC	2		CDE	1
DBA	1		DCD	2		DEF	1
EFG	1		FGC	1		GCD	1
HBA	1						
ABAB	3		ABAC	1		ACDE	1
AHBA	1		BABA	4		BACD	1
BAHB	1		CDBA	1		CDCD	2
CDEF	1		DBAH	1		DCDB	1
DCDC	1		EFGC	1		FGCD	1
GCDC	1		HBAB	1			

Table 10: Various frequent serial episodes for DATA SET 10

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	9		B	8		C	8
D	8		E	6		F	2
G	1		H	1		I	1
J	1		K	1		L	1
M	1						
AB	2		AC	1		AD	1
AE	4		AG	1		BA	7
BB	1		CB	4		CD	2
CH	1		DB	1		DC	1
DD	4		DE	1		DI	1
EC	4		EF	2		FA	2
GD	1		HC	1		IC	1
ABA	2		ACB	1		ADD	1
AEC	3		AEF	1		AGD	1
BAB	1		BAC	1		BAE	4
BAG	1		BBA	1		CBA	3
CBB	1		CDB	1		CDD	1
CHC	1		DBA	1		DCH	1
DDC	1		DDD	1		DDE	1
DDI	1		DEC	1		DIC	1
ECB	3		ECD	1		EFA	2
FAB	1		FAD	1		GDD	1
HCD	1						

Table 11: Various frequent serial episodes for DATA SET 11

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
ABAE	2		ACBA	1		ADDC	1
AECB	2		AECD	1		AEFA	1
AGDD	1		BABA	1		BACB	1
BAEC	3		BAEF	1		BAGD	1
BBAE	1		CBAC	1		CBAE	1
CBAG	1		CBBA	1		CDBA	1
CDDI	1		CHCD	1		DBAB	1
DCHC	1		DDCH	1		DDDE	1
DDEC	1		DDIC	1		DECB	1
ECBA	2		ECBB	1		ECDB	1
EFAB	1		EFAD	1		FABA	1
FADD	1		GDDD	1		HCDD	1

Table 12: Various frequent serial episodes for DATA SET 11 continued

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Episode	No. Occurrences	Episode	No. Occurrences	Episode	No. Occurrences
A	10	B	9	C	8
D	7	E	5	F	4
G	1	H	1	I	1
J	1	K	1	L	1
M	1				
AB	6	AE	4	BA	6
BD	3	CA	3	CD	2
CF	2	CG	1	DC	3
DD	1	DF	2	EC	5
FB	3	FE	1	GH	1
HA	1				
ABA	3	ABD	3	AEC	4
BAB	2	BAE	4	BDC	1
BDD	1	BDF	1	CAB	3
CDC	1	CDF	1	CFB	1
CFE	1	CGH	1	DCA	3
DFB	2	ECD	2	ECF	2
ECG	1	FBA	3	FEC	1
GHA	1	HAB	1		

Table 13: Various frequent serial episodes for DATA SET 12

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
ABAE	3		ABDC	1		ABDD	1
ABDF	1		AECD	2		AECF	2
BABD	2		BAEC	4		BDCA	1
BDFB	1		CABA	2		CABD	1
CDCA	1		CDFB	1		CFBA	1
CFEC	1		CGHA	1		DCAB	3
DFBA	2		ECDC	1		ECDF	1
ECFB	1		ECFE	1		ECGH	1
FBAB	2		FBAE	1		FECG	1
GHAB	1		HABA	1			

Table 14: Various frequent serial episodes for DATA SET 12 continued

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	9		B	8		C	7
D	6		E	4		F	3
G	1		H	1		I	1
J	1		K	1		L	1
M	1		N	1		O	1
AA	2		AB	6		AH	1
BC	6		BG	1		BM	1
CD	2		CE	1		CF	2
CI	1		DA	4		DB	2
EA	3		EN	1		FE	3
GD	1		HD	1		IJ	1
JK	1		KL	1		LD	1
MF	1		NO	1		OC	1
AAA	1		AAB	1		ABC	5
ABG	1		AHD	1		BCD	2
BCE	1		BCF	2		BCI	1
BGD	1		BMF	1		CDA	2
CEA	1		CFE	2		CIJ	1
DAB	4		DBC	1		DBM	1
EAA	1		EAB	1		EAH	1
ENO	1		FEA	2		FEN	1
GDB	1		HDA	1		IJK	1
JKL	1		KLD	1		LDB	1
MFE	1		NOC	1			

Table 15: Various frequent serial episodes for DATA SET 13

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AAAB	1		AABC	1		ABCD	1
ABCE	1		ABCF	2		ABCI	1
ABGD	1		AHDA	1		BCDA	2
BCEA	1		BCFE	2		BCIJ	1
BGDB	1		BMFE	1		CDAB	2
CEAA	1		CFEA	2		CIJK	1
DABC	3		DABG	1		DBCD	1
DBMF	1		EAAA	1		EABC	1
EAHD	1		ENOC	1		FEAB	1
FEAH	1		FENO	1		GDBC	1
HDAB	1		IJKL	1		JKLD	1
KLDB	1		LDBM	1		MFEN	1

Table 16: Various frequent serial episodes for DATA SET 13 continued

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	9		B	6		C	4
D	5		E	5		F	4
G	1		H	1		I	1
J	1		K	1		L	1
M	1		N	1		O	1
AA	1		AB	2		AC	3
AD	1		AE	1		AF	1
BD	1		BF	3		BH	1
BJ	1		CC	1		CD	2
CE	1		DA	4		DI	1
EA	3		EB	1		EG	1
FD	1		FE	2		GB	1
HA	1		IB	1		JB	1
AAC	1		ABD	1		ABF	1
ACC	1		ACD	1		ACE	1
ADA	1		AEB	1		AFD	1
BDI	1		BFE	2		BHA	1
BJB	1		CCD	1		CDA	2
CEA	1		DAB	1		DAC	2
DAF	1		DIB	1		EAB	1
EAD	1		EAE	1		EBF	1
EGB	1		FDA	1		FEA	2
GBH	1		HAA	1		IBJ	1
JBF	1						

Table 17: Various frequent serial episodes for DATA SET 14

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AACE	1		ABDI	1		ABFE	1
ACCD	1		ACDA	1		ACEA	1
ADAF	1		AEBF	1		AFDA	1
BDIB	1		BFEA	2		BHAA	1
BJBF	1		CCDA	1		CDAB	1
CDAC	1		CEAD	1		DABD	1
DACC	1		DACD	1		DAFD	1
DIBJ	1		EABF	1		EADA	1
EAEB	1		EGBH	1		FDAC	1
FEAB	1		FEAE	1		GBHA	1
HAAC	1		IBJB	1		JBFE	1

Table 18: Various frequent serial episodes for DATA SET 14 continued

Episode	No. Occurrences	Episode	No. Occurrences	Episode	No. Occurrences
A	7	B	8	C	7
D	7	E	5	F	5
G	5	H	3	I	3
J	3	K	2	L	1
M	1	N	1	O	1
P	1				
AC	1	AD	2	AE	1
AF	2	AG	1	BA	4
BC	1	BD	1	BE	1
BK	1	CB	3	CD	1
CG	2	CI	1	DB	1
DC	2	DG	1	DH	2
DI	1	EA	2	EB	1
EH	1	EJ	1	FB	1
FC	2	FD	1	GA	1
GE	1	GI	1	GN	1
GP	1	HB	2	HC	1
ID	1	IJ	1	IO	1
JD	1	JF	2	KJ	1
KM	1	LK	1	MF	1
NE	1	OG	1	PE	1
ACG	1	ADC	1	ADI	1
AEH	1	AFC	1	AGE	1
BAD	2	BAE	1	BAG	1
BCI	1	BDH	1	BEB	1
BKJ	1	CBC	1	CBD	1
CBK	1	CDB	1	CGI	1
CGN	1	CID	1	DBA	1
DCB	1	DCD	1	DGA	1
DHB	2	DIJ	1	EAF	2
EBA	1	EHC	1	EJD	1

Table 19: Various frequent serial episodes for DATA SET 15

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
FBA	1		FCB	1		FCG	1
FDH	1		GAC	1		GEA	1
GIO	1		GNE	1		GPE	1
HBA	1		HBE	1		HCB	1
IDG	1		IJF	1		IOG	1
JDC	1		JFC	1		JFD	1
KJF	1		KMF	1		LKM	1
MFB	1		NEA	1		OGP	1
PEJ	1						
ACGI	1		ADCB	1		ADIJ	1
AEHC	1		AFCB	1		AGEA	1
BADC	1		BADI	1		BAEH	1
BAGE	1		BCID	1		BDHB	1
BEBA	1		BKJF	1		CBCI	1
CBDH	1		CBKJ	1		CDBA	1
CGIO	1		CGNE	1		CIDG	1
DBAG	1		DCBK	1		DCDB	1
DGAC	1		DHBA	1		DHBE	1
DIJF	1		EAFC	1		EBAD	1
EHCB	1		EJDC	1		FBAD	1
FCBD	1		FCGN	1		FDHB	1
GACG	1		GEAF	1		GIOG	1
GNEA	1		GPEJ	1		HBAE	1
HBEB	1		HCBC	1		IDGA	1
IJFD	1		IOGP	1		JDCD	1
JFCG	1		JFDH	1		KJFC	1
KMFB	1		LKMF	1		MFBA	1
NEAF	1		OGPE	1		PEJD	1

Table 20: Various frequent serial episodes for DATA SET 15 continued

Parallel Episodes

This document contains the various parallel episodes that were detected from the fifteen event sequences found in Appendix D.

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AA	1		AB	2		AC	4
AD	5		AE	1		AG	1
AI	1		AJ	1		AL	1
BB	1		BC	2		BF	2
BH	1		CG	1		CH	1
DF	1		EI	1		EK	1
EL	1		FG	1		GH	1
JK	1						
AAB	1		AAC	2		AAD	2
ABB	1		ABC	2		ABD	1
ABF	1		ACD	2		ACE	1
ACG	1		ADF	1		ADI	1
ADJ	1		AEI	2		AEL	1
AGL	1		AJK	1		BBC	1
BCH	1		BDF	1		BFG	1
BFH	1		CGH	1		EJK	1
EKL	1		FGH	1			
AABB	1		AABC	2		AABD	1
AACD	3		AACE	1		AADJ	1
AAEI	1		ABBC	2		ABCD	1
ABDF	3		ACEI	1		ACGH	1
ACGL	1		ADEI	1		ADFI	1
ADJK	1		AEGL	1		AEJK	1
AEKL	1		BCFH	1		BCGH	1
BFGH	2		EJKL	1			

Table 1: Various frequent parallel episodes for DATA SET 1

Episode	No. Occurrences	Episode	No. Occurrences	Episode	No. Occurrences
AB	1	AC	3	AD	8
AJ	2	BC	6	BD	4
BE	1	BF	1	BI	1
CE	1	CG	1	CH	1
FG	1	HI	1		
AAD	2	AAJ	1	ABC	3
ABD	4	ABJ	1	ACD	3
ACH	1	ADD	2	ADJ	1
BCC	1	BCD	2	BCE	2
BCF	1	BCG	1	BDE	1
BDI	1	BFG	1	BHI	1
CFG	1	CHI	1		
AABJ	1	AACD	2	AADD	2
AADJ	1	ABCD	6	ABCF	1
ABCJ	1	ABDD	2	ABDE	1
ABDI	1	ABDJ	1	ACDH	1
ACHI	1	BBCE	1	BCCE	1
BCDE	1	BCDG	1	BCFG	3
BCHI	1	BDHI	1		

Table 2: Various frequent parallel episodes for DATA SET 2

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	6		AC	3		AD	1
AE	1		AF	1		AH	1
AI	1		AM	1		BG	1
BL	1		CD	3		DG	1
DH	1		EF	1		IJ	1
JK	1		KL	1			
AAB	2		AAC	1		ABD	1
ABE	1		ABF	1		ABG	1
ABH	1		ABI	1		ABL	1
ABM	1		ACC	1		ACD	2
ADH	1		AEF	2		AIJ	1
BDG	1		BKL	1		CCD	1
CDD	1		DGH	1		IJK	1
JKL	1						
AABD	1		AABE	1		AABH	1
AABI	1		AACC	1		AAEF	1
ABCD	1		ABDG	1		ABDH	1
ABEF	2		ABFG	1		ABIJ	1
ABKL	1		ABLM	1		ACCD	2
ACDD	1		ADGH	1		AIJK	1
BDGH	1		BJKL	1		CCDD	1
IJKL	1						

Table 3: Various frequent parallel episodes for DATA SET 3

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	15		AD	4		BC	5
CD	9						
AAB	5		ABB	5		ABC	5
ABD	4		ACD	4		BCD	5
CCD	2		CDD	2			
AABB	8		AABD	1		ABBC	2
ABCD	15		ACDD	1		BCCD	1
CCDD	3						

Table 4: Various frequent parallel episodes for DATA SET 4

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	8		AD	5		AE	3
BC	4		BE	3		CD	5
ABC	4		ABD	5		ABE	9
ACD	5		BCD	4			
AABE	3		ABBE	3		ABCD	17
ABDE	1		ABEE	2			

Table 5: Various frequent parallel episodes for DATA SET 5

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AA	1		AC	6		AD	2
AE	1		AF	1		BC	2
BD	1		BE	7		BG	2
CF	2		DD	1		DF	3
DG	2						
AAC	4		ABE	1		ACC	2
ACF	1		ADD	1		ADE	1
ADF	3		BBE	3		BCE	1
BCF	1		BCG	1		BDE	1
BDG	3		BEE	2		BEG	1
CDF	2		DDF	1		DFG	1
AAAC	2		AACC	3		ABDE	2
ACCF	1		ACDF	2		ADDE	1
ADDF	3		ADFF	1		BBCE	1
BBDG	1		BBEE	4		BBEG	1
BCDF	1		BCDG	1		BCEF	1
BDEG	2		BDFG	1		CDFG	1

Table 6: Various frequent parallel episodes for DATA SET 6

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	4		AD	11		AE	5
BC	5		BD	1		BF	9
CE	6		CG	1		CH	2
EG	1						
AAD	5		ABC	2		ABD	4
ABE	1		ABF	2		ACE	5
ADD	2		ADE	4		BBF	4
BCD	1		BCE	4		BCF	2
BCH	1		BFF	2		CCH	1
CEG	3		CEH	1			
AABD	3		AADD	4		AADE	3
ABBF	2		ABCD	2		ABCE	8
ABDE	1		ABDF	2		ACDE	4
ACEG	1		BBCF	2		BBFF	3
BCCH	1		BCDH	1		BCEF	2
CCEG	1		CCEH	1		CEEG	1
CEGH	1						

Table 7: Various frequent parallel episodes for DATA SET 7

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	11		AF	1		AG	1
AH	1		BE	1		BI	1
BJ	1		CD	6		CF	1
CH	1		CI	1		CJ	1
DE	1		DG	2		EF	2
EG	1						
AAB	4		ABB	4		ABE	1
ABF	1		ABG	1		ABH	1
ABI	1		ABJ	1		ACH	1
ADG	1		AEF	1		BCI	1
BCJ	1		BDE	1		CCD	2
CDD	1		CDE	1		CDF	1
CDG	1		CDH	1		CDI	1
CDJ	1		CEF	1		DEG	1
EFF	1						
AABB	6		AABG	1		AABH	1
ABBI	1		ABBJ	1		ABCH	1
ABCI	1		ABCJ	1		ABDE	1
ABDG	1		ABEF	2		ACDH	1
AEFF	1		BCDE	1		BCDI	1
BCDJ	1		CCDD	1		CCDF	1
CCDH	1		CCDI	1		CDDE	1
CDEF	1		CDEG	1		CDGJ	1
CEFF	1						

Table 8: Various frequent parallel episodes for DATA SET 8

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AA	2		AB	1		AC	2
AF	1		BD	4		BE	1
CC	1		EF	1			
AAA	1		AAC	1		AAF	1
ABC	1		ABD	1		ACC	1
AEF	1		BBD	2		BDD	1
BDE	1		BEF	1			
AAAC	1		AAAF	1		AAEF	1
ABBD	1		ABCC	1		ABCD	1
ABEF	1		BBDD	2		BBDE	1
BDEF	1						

Table 9: Various frequent parallel episodes for DATA SET 9

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	10		AC	1		AH	1
BD	1		BH	1		CD	6
CG	1		DE	1		EF	2
FG	1						
AAB	4		ABB	4		ABC	1
ABD	1		ABH	3		ACD	1
BCD	1		CCD	2		CDD	2
CDE	1		CDG	1		CFG	1
DEF	1		EFG	1			
AABB	7		AABC	1		AABH	1
ABBH	2		ABCD	2		ABDH	1
ACDE	1		BCDD	1		CCDD	3
CCDG	1		CDEF	1		CDFG	1
CEFG	1						

Table 10: Various frequent parallel episodes for DATA SET 10

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	9		AC	1		AD	1
AE	4		AF	2		AG	1
BB	1		BC	4		BD	1
CD	3		CE	4		CH	2
CI	1		DD	4		DE	1
DG	1		DI	1		EF	2
AAB	2		ABB	2		ABC	5
ABD	1		ABE	4		ABF	1
ABG	1		ACE	3		ADD	1
ADF	1		ADG	1		AEF	3
BBC	1		BCD	1		BCE	3
CCH	1		CDD	2		CDE	2
CDH	2		CDI	1		DDD	1
DDE	1		DDG	1		DDI	1
AABB	1		AABC	1		AABE	2
AABF	1		AAEF	1		ABBC	2
ABBD	1		ABBE	1		ABCC	1
ABCD	1		ABCE	8		ABCG	1
ABDG	1		ABEF	2		ACDD	1
ACDE	1		ADDF	1		ADDG	1
ADEF	1		BBCE	1		BCDE	2
CCDH	2		CDDE	1		CDDH	2
CDDI	2		DDDE	1		DDDG	1

Table 11: Various frequent parallel episodes for DATA SET 11

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	12		AC	3		AE	4
AH	1		BD	3		BF	3
CD	5		CE	5		CF	2
CG	1		DD	1		DF	2
EF	1		GH	1			
AAB	3		ABB	2		ABC	3
ABD	3		ABE	4		ABF	3
ABH	1		ACD	3		ACE	4
AGH	1		BCD	1		BCF	1
BDD	1		BDF	3		CCD	1
CDE	2		CDF	1		CEF	4
CEG	1		CGH	1			
AABC	2		AABE	3		AABH	1
ABBD	2		ABBF	2		ABCD	6
ABCE	4		ABCF	1		ABDD	1
ABDF	3		ABEF	1		ABGH	1
ACCD	1		ACDE	2		ACEF	2
ACGH	1		BBDF	1		BCDF	1
BCEF	1		CCDE	1		CCEF	1
CDEF	1		CEEF	1		CEFG	1
CEGH	1						

Table 12: Various frequent parallel episodes for DATA SET 12

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AA	2		AB	6		AD	4
AE	3		AH	1		BC	6
BD	2		BG	1		BM	1
CD	2		CE	1		CF	2
CI	1		CO	1		DG	1
DH	1		DL	1		EF	3
EN	1		FM	1		IJ	1
JK	1		KL	1		NO	1
AAA	1		AAB	1		AAE	1
ABC	5		ABD	4		ABE	1
ABG	1		ACD	2		ACE	1
ADH	2		AEF	2		AEH	1
BCD	3		BCE	1		BCF	2
BCI	1		BDG	2		BDL	1
BDM	1		BFM	1		CEF	2
CIJ	1		CNO	1		DKL	1
EFM	1		EFN	1		ENO	1
IJK	1		JKL	1			
AAAB	1		AAAE	1		AABC	1
AACE	1		AADH	1		ABCD	8
ABCE	3		ABCF	2		ABCI	1
ABDG	2		ABDH	1		ABEF	1
ACEF	2		ADEH	1		AEFH	1
BBDG	1		BCDD	1		BCDG	1
BCEF	2		BCIJ	1		BDFM	1
BDKL	1		BDLM	1		BEFM	1
CENO	1		CIJK	1		DJKL	1
EFMN	1		EFNO	1		IJKL	1

Table 13: Various frequent parallel episodes for DATA SET 13

Episode	No. Occurrences	Episode	No. Occurrences	Episode	No. Occurrences
AA	1	AB	2	AC	3
AD	5	AE	4	AF	1
AH	1	BD	1	BE	1
BF	3	BG	1	BH	1
BI	1	BJ	2	CC	1
CD	2	CE	1	DF	1
DI	1	EF	2	EG	1
AAC	1	AAD	1	AAH	1
ABD	2	ABE	2	ABF	1
ABH	1	ACC	1	ACD	5
ACE	2	ADE	1	ADF	3
AEE	1	AEF	2	BBJ	1
BDI	2	BEF	3	BEG	1
BFJ	1	BGH	1	BIJ	1
CCD	1				
AABH	1	AACD	1	AACE	2
AACH	1	AADE	1	AADF	2
ABCD	1	ABDD	1	ABDI	1
ABEE	1	ABEF	6	ABGH	1
ACCD	4	ACDD	1	ACDE	1
ACDF	1	ADDF	1	AEEF	1
BBDI	1	BBFJ	1	BBIJ	1
BDIJ	1	BEFJ	1	BEGH	1

Table 14: Various frequent parallel episodes for DATA SET 14

14

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AB	4		AC	1		AD	2
AE	3		AF	2		AG	2
BC	4		BD	2		BE	2
BF	1		BH	2		BK	1
CD	3		CF	2		CG	2
CH	1		CI	1		DF	1
DG	1		DH	2		DI	2
DJ	1		EG	1		EH	1
EJ	1		EN	1		EP	1
FJ	2		FM	1		GI	1
GN	1		GO	1		GP	1
IJ	1		IO	1		JK	1
KL	1		KM	1			
ABD	3		ABE	2		ABF	1
ABG	1		ABH	1		ACD	1
ACF	1		ACG	2		ADG	1
ADI	1		AEF	2		AEG	2
AEH	1		AEN	1		BBE	1
BCC	1		BCD	3		BCF	1
BCH	1		BCI	1		BCK	1
BDH	3		BEH	1		BFM	1
BJK	1		CDD	1		CDI	1
CDJ	1		CEH	1		CFG	1
CFJ	1		CGI	1		CGN	1
DEJ	1		DFH	1		DFJ	1
DGI	1		DIJ	1		EGN	1
EGP	1		EJP	1		FIJ	1
FJK	1		FKM	1		GIO	2
GOP	1		KLM	1			

Table 15: Various frequent parallel episodes for DATA SET 15

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AAEG	1		ABBE	1		ABCD	3
ABCF	1		ABDE	1		ABDF	1
ABDG	1		ABDH	1		ABDI	1
ABEG	1		ABEH	2		ABFM	1
ACDG	1		ACEF	1		ACEH	1
ACGG	1		ACGI	1		ADGI	1
ADIJ	1		AEFG	1		AEFN	1
AEGN	1		BBDH	1		BBEH	1
BCCH	1		BCCI	1		BCDD	1
BCDF	1		BCDH	1		BCDI	1
BCDK	1		BCEH	1		BCJK	1
BDEH	1		BDFH	1		BFJK	1
BFKM	1		CDDJ	1		CDEJ	1
CDGI	1		CEGN	1		CFGJ	1
CFGN	1		CFJK	1		CGIO	1
DEJP	1		DFHJ	1		DFIJ	2
EGJP	1		EGOP	1		FKLM	1
GGIO	1		GIOP	1			

Table 16: Various frequent parallel episodes for DATA SET 15 continued

Serial Rules

This document contains the serial rules that were generated from the fifteen test event sequences. Only rules which have a percentage certainty greater than or equal to fifty percent are shown. Furthermore, rules are only shown if they have occurred at least twice in the event sequence.

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
CAD	A	100%	2/2
AD	A	100%	2/2
BC	A	100%	2/2
CA	D	67%	2/3
C	A	75%	3/4
D	A	100%	3/3

Table 1: Various serial rules generated from DATA SET 1

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ADA	C	100%	2/2
BDA	D	50%	2/4
CBD	A	100%	2/2
DAC	B	67%	2/3
DAD	A	100%	2/2
AC	B	67%	2/3
AD	A	100%	2/2
BD	A	100%	4/4
CB	D	50%	2/4
DA	C	50%	3/6
B	D	57%	4/7
C	B	57%	4/7
D	A	100%	6/6

Table 2: Various serial rules generated from DATA SET 2

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
AB	A	67%	2/3
B	A	75%	3/4
C	D	67%	2/3

Table 3: Various serial rules generated from DATA SET 3

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ABA	B	100%	5/5
ABC	D	100%	5/5
BAB	A	60%	3/5
BCD	A	60%	3/5
CDA	B	100%	4/4
CDC	D	100%	2/2
DAB	C	75%	3/4
AB	A	50%	5/10
AB	C	50%	5/10
BA	B	100%	5/5
BC	D	100%	5/5
CD	A	57%	4/7
DA	B	100%	4/4
DC	D	100%	2/2
A	B	100%	10/10
B	A	50%	5/10
B	C	50%	5/10
C	D	100%	7/7
D	A	57%	4/7

Table 4: Various serial rules generated from DATA SET 4

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ABC	D	100%	4/4
ABE	A	100%	3/3
BCD	A	100%	4/4
BEA	B	100%	3/3
CDA	B	100%	5/5
DAB	C	80%	4/5
EAB	E	67%	2/3
AB	C	50%	4/8
BC	D	100%	4/4
BE	A	100%	3/3
CD	A	100%	5/5
DA	B	100%	5/5
EA	B	100%	3/3
A	B	100%	8/8
B	C	50%	4/8
C	D	100%	5/5
D	A	100%	5/5
E	A	100%	3/3

Table 5: Various serial rules generated from DATA SET 5

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
BEB	E	67%	2/3
EBE	B	100%	2/2
AC	A	67%	2/3
BE	B	100%	3/3
CA	C	67%	2/3
CF	D	100%	2/2
DG	B	100%	2/2
EB	E	50%	2/4
A	C	50%	3/6
B	E	50%	3/6
C	A	50%	3/6
E	B	100%	4/4
F	D	100%	3/3
G	B	100%	2/2

Table 6: Various serial rules generated from DATA SET 6

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ADA	E	60%	3/5
AEC	B	80%	4/5
BAD	A	100%	3/3
BFB	A	50%	2/4
CBF	B	100%	2/2
DAD	A	100%	2/2
DAE	C	100%	4/4
ECB	A	50%	2/4
ECB	F	50%	2/4
FBA	D	100%	2/2
FBF	B	100%	2/2
AD	A	100%	5/5
AE	C	100%	5/5
BA	D	75%	3/4
BF	B	100%	4/4
DA	E	67%	4/6
EC	B	67%	4/6
A	D	50%	5/10
A	E	50%	5/10
C	B	71%	5/7
D	A	100%	6/6
E	C	100%	6/6
F	B	100%	5/5

Table 7: Various serial rules generated from DATA SET 7

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ABA	B	75%	3/4
BAB	A	75%	3/4
AB	A	67%	4/6
BA	B	80%	4/5
CD	C	67%	2/3
A	B	86%	6/7
B	A	71%	5/7
C	D	60%	3/5
D	C	60%	3/5

Table 8: Various serial rules generated from DATA SET 8

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
BD	B	100%	2/2
A	A	50%	2/4
B	D	67%	2/3
D	B	100%	2/2

Table 9: Various serial rules generated from DATA SET 9

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ABA	B	75%	3/4
BAB	A	100%	4/4
CDC	D	100%	2/2
AB	A	100%	4/4
BA	B	67%	4/6
CD	C	50%	2/4
DC	D	100%	2/2
A	B	67%	4/6
B	A	100%	6/6
C	D	100%	4/4
D	C	50%	2/4
E	F	100%	2/2

Table 10: Various serial rules generated from DATA SET 10

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ABA	E	100%	2/2
AEC	B	67%	2/3
BAE	C	75%	3/4
ECB	A	67%	2/3
AB	A	100%	2/2
AE	C	75%	3/4
BA	E	57%	4/7
CB	A	75%	3/4
EC	B	75%	3/4
EF	A	100%	2/2
B	A	88%	7/8
C	B	50%	4/8
D	D	50%	4/8
E	C	67%	4/6
F	A	100%	2/2

Table 11: Various serial rules generated from DATA SET 11

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ABA	E	100%	3/3
AEC	D	50%	2/4
AEC	F	50%	2/4
BAB	D	100%	2/2
BAE	C	100%	4/4
CAB	A	67%	2/3
DCA	B	100%	3/3
DFB	A	100%	2/2
FBA	B	67%	2/3
AB	A	50%	3/6
AB	D	50%	3/6
AE	C	100%	4/4
BA	E	67%	4/6
CA	B	100%	3/3
DC	A	100%	3/3
DF	B	100%	2/2
FB	A	100%	3/3
A	B	60%	6/10
B	A	67%	6/9
E	C	100%	5/5
F	B	75%	3/4

Table 12: Various serial rules generated from DATA SET 12

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
BCD	A	100%	2/2
BCF	E	100%	2/2
CDA	B	100%	2/2
CFE	A	100%	2/2
DAB	C	75%	3/4
AB	C	83%	5/6
CD	A	100%	2/2
CF	E	100%	2/2
DA	B	100%	4/4
FE	A	67%	2/3
A	B	67%	6/9
B	C	75%	6/8
D	A	67%	4/6
E	A	75%	3/4
F	E	100%	3/3

Table 13: Various serial rules generated from DATA SET 13

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
BFE	A	100%	2/2
BF	E	67%	2/3
CD	A	100%	2/2
DA	C	50%	2/4
FE	A	100%	2/2
B	F	50%	3/6
C	D	50%	2/4
D	A	80%	4/5
E	A	60%	3/5
F	E	50%	2/4

Table 14: Various serial rules generated from DATA SET 14

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
BA	D	50%	2/4
DH	B	100%	2/2
EA	F	100%	2/2
B	A	50%	4/8
H	B	67%	2/3
J	F	67%	2/3

Table 15: Various serial rules generated from DATA SET 15

Test Results

This document contains the results from the 3 tests performed. Only rules which have a percentage certainty greater than or equal to fifty percent are shown. Furthermore, rules are only shown if they have occurred at least twice in the event sequence.

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	8		B	8		C	5
D	5		E	3			
AB	8		BC	4		BE	3
CD	5		DA	5		EA	3
ABC	4		ABE	3		BCD	4
BEA	3		CDA	5		DAB	5
EAB	3						
ABCD	4		ABEA	3		BCDA	4
BEAB	3		CDAB	5		DABC	4
DABE	1		EABE	2			
ABCDA	4		ABEAB	3		BCDAB	4
BEABE	2		CDABC	4		CDABE	1
DABCD	4		DABEA	1		EABEA	2
ABCDAB	4		ABEABE	2		BCDABC	3
BCDABE	1		BEABEA	2		CDABCD	4
CDABEA	1		DABCDA	4		DABEAB	1
EABEAB	2						

Table 1: Frequent serial events from TEST 1.

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ABCDA	B	100%	4/4
ABEAB	E	67%	2/3
BCDAB	C	75%	3/4
BEABE	A	100%	2/2
CDABC	D	100%	4/4
DABCD	A	100%	4/4
EABEA	B	100%	2/2
ABCD	A	100%	4/4
ABEA	B	100%	3/3
BCDA	B	100%	4/4
BEAB	E	67%	2/3
CDAB	C	80%	4/5
DABC	D	100%	4/4
EABE	A	100%	2/2
ABC	D	100%	4/4
ABE	A	100%	3/3
BCD	A	100%	4/4
BEA	B	100%	3/3
CDA	B	100%	5/5
DAB	C	80%	4/5
EAB	E	67%	2/3
AB	C	50%	4/8
BC	D	100%	4/4
BE	A	100%	3/3
CD	A	100%	5/5
DA	B	100%	5/5
EA	B	100%	3/3
A	B	100%	8/8
B	C	50%	4/8
C	D	100%	5/5
D	A	100%	5/5
E	A	100%	3/3

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Table 2: Serial rules generated from TEST 1.

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	9		B	5		C	8
D	8						
AB	5		AC	3		BC	5
CD	8		DA	8			
ABC	5		ACD	3		BCD	5
CDA	8		DAB	4		DAC	3
ABCD	5		ACDA	3		BCDA	5
CDAB	4		CDAC	3		DABC	4
DACD	3						
ABCDA	5		ACDAC	2		BCDAB	4
BCDAC	1		CDABC	4		CDACD	3
DABCD	4		DACDA	3			
ABCDAB	4		ABCDAC	1		ACDACD	2
BCDABC	4		BCDACD	1		CDABCD	4
CDACDA	3		DABCDA	4		DACDAC	2

Table 3: Frequent serial events from TEST 2.

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
ABCDA	B	80%	4/5
ACDAC	D	100%	2/2
BCDAB	C	100%	4/4
CDABC	D	100%	4/4
CDACD	A	100%	3/3
DABCD	A	100%	4/4
DACDA	C	67%	2/3
ABCD	A	100%	5/5
ACDA	C	67%	2/3
BCDA	B	80%	4/5
CDAB	C	100%	4/4
CDAC	D	100%	3/3
DABC	D	100%	4/4
DACD	A	100%	3/3
ABC	D	100%	5/5
ACD	A	100%	3/3
BCD	A	100%	5/5
CDA	B	50%	4/8
DAB	C	100%	4/4
DAC	D	100%	3/3
AB	C	100%	5/5
AC	D	100%	3/3
BC	D	100%	5/5
CD	A	100%	8/8
DA	B	50%	4/8
A	B	56%	5/9
B	C	100%	5/5
C	D	100%	8/8
D	A	100%	8/8

Table 4: Serial rules generated from TEST 2.

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
A	2		B	2		C	0
D	1		E	6		F	10
G	3		H	7		I	6
J	0		K	8		L	8
AE	1		AF	1		BI	2
EG	1		EH	3		EI	2
FK	5		FL	5		GA	2
GB	1		HE	2		HF	5
IK	3		IL	3		KD	1
KE	3		KF	4		LG	2
LH	4		LI	2			
AEH	1		AFK	1		BIK	1
BIL	1		EGB	1		EHF	3
EIL	2		FKE	1		FKF	4
FLG	1		FLH	3		FLI	1
GAE	1		GAF	1		GBI	1
HEG	1		HEI	1		HFK	2
HFL	3		IKD	1		IKE	2
ILG	1		ILH	1		ILI	1
KEH	2		KEI	1		KFK	2
KFL	2		LGA	2		LHE	2
LHF	2		LIK	2			

Table 5: Frequent serial events from TEST 3.

Episode	No. Occurrences		Episode	No. Occurrences		Episode	No. Occurrences
AEHF	1		AFKF	1		BIKE	1
BILI	1		EGBI	1		EHFK	1
EHFL	2		EILG	1		EILH	1
FKEI	1		FKFK	2		FKFL	2
FLGA	1		FLHE	2		FLHF	1
FLIK	1		GAEH	1		GAFK	1
GBIK	1		HEGB	1		HEIL	1
HFKF	2		HFLG	1		HFLH	1
HFLI	1		IKEH	2		ILGA	1
ILHF	1		ILIK	1		KEHF	2
KEIL	1		KFKE	1		KFKF	1
KFLH	2		LGAE	1		LGAF	1
LHEG	1		LHEI	1		LHFK	1
LHFL	1		LIKD	1		LIKE	1
AEHFK	1		AFKFL	1		BIKEH	1
BILIK	1		EGBIK	1		EHFKF	1
EHFLH	1		EHFLI	1		EILGA	1
EILHF	1		FKEIL	1		FKFKE	1
FKFKF	1		FKFLH	2		FLGAE	1
FLHEG	1		FLHEI	1		FLHFK	1
FLIKD	1		GAEHF	1		GAFKF	1
GBIKE	1		HEGBI	1		HEILH	1
HFKFK	2		HFLGA	1		HFLHE	1
HFLIK	1		IKEHF	2		ILGAF	1
ILHFL	1		ILIKE	1		KEHFL	2
KEILG	1		KFKEI	1		KFKFL	1
KFLHE	1		KFLHF	1		LGAEH	1
LGAFK	1		LHEGB	1		LHEIL	1
LHFKF	1		LHFLG	1		LIKEH	1

Table 6: Frequent serial events from TEST 3 continued.

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
IKEHF	L	100%	2/2
FKFL	H	100%	2/2
HFKF	K	100%	2/2
IKEH	F	100%	2/2
KEHF	L	100%	2/2
EHF	L	67%	2/3
FKF	K	50%	2/4
FKF	L	50%	2/4
FLH	E	67%	2/3
HFK	F	100%	2/2
IKE	H	100%	2/2
KEH	F	100%	2/2
KFL	H	100%	2/2
EH	F	100%	3/3
EI	L	100%	2/2
FK	F	80%	4/5
FL	H	60%	3/5
HF	L	60%	3/5
IK	E	67%	2/3
KE	H	67%	2/3
KF	K	50%	2/4
KF	L	50%	2/4
LG	A	100%	2/2
LH	E	50%	2/4
LH	F	50%	2/4
LI	K	100%	2/2

Table 7: Serial rules generated from TEST 3.

Event Sequence	Next Event	Percentage Certainty	No. Occurrences
B	I	100%	2/2
E	H	50%	3/6
F	K	50%	5/10
F	L	50%	5/10
G	A	67%	2/3
H	F	71%	5/7
I	K	50%	3/6
I	L	50%	3/6
K	F	50%	4/8
L	H	50%	4/8

Table 8: Serial rules generated from TEST 3 continued.