Heap Size	Checkpoint Overhead (sec)			
(Mbytes)	Sequential	Main Memory	CLL	Copy-on-Write
0.789	3.53	2.34	0.60	1.40
2.985	10.28	6.12	3.84	4.42
3.962	12.76	7.25	3.36	3.85
4.938	15.73	9.70	3.63	5.66
7.868	24.67	16.39	4.31	6.08
9.821	30.03	19.16	4.38	7.79

Table B.2: Checkpoint Overhead of Multiprocessor Algorithms

Heap Size	Latency Data (sec)	
(Mbytes)	Initial Stop Time	Maximum Page Fault Time
0.789	0.03	0.010
2.985	0.10	0.023
3.962	0.12	0.025
4.938	0.15	0.037
7.868	0.23	0.055
9.821	0.28	0.053
12.751	0.34	0.064

Table B.3: Latency Data of Multiprocessor Algorithms

Page Size (Kbytes)	Number of Faults	Maximum Page Fault Time (sec)
1	920	0.03
2	599	0.03
4	371	0.05
8	208	0.05
16	113	0.08
32	69	0.22
64	40	0.31
128	15	1.24

Table B.4: Data Concerning Page Size of the CLL Algorithm

Test Program	Heap Size (Mbytes)	Checkpoint Time (sec)	Checkpoint Overhead (sec)
Travelling Salesman	0.064	2.36	0.17
Matrix Multiplication	0.513	3.91	0.07
Pattern Match	1.233	6.37	0.07
Bubble Sort	3.000	14.71	0.75

Table B.5: Data of Other Test Programs

Appendix C

Tables for the Multicomputer Implementation

Algorithm	Main Memory	Com-pressed	Stag-gered	Checkpoint Time (sec)	Checkpoint Overhead (sec)
SNS	No	No	-	3.76	3.82
SNS	Yes	No	-	7.11	0.86
SNS	No	Yes	-	2.92	2.96
SNS	Yes	Yes	-	5.33	0.89
CL	No	No	No	3.68	3.61
CL	No	No	Yes	3.90	3.44
CL	Yes	No	No	6.96	0.84
CL	Yes	No	Yes	6.99	0.83
CL	No	Yes	No	2.43	2.35
CL	No	Yes	Yes	2.95	2.24
CL	Yes	Yes	No	5.43	0.93
CL	Yes	Yes	Yes	5.72	0.88
NS	No	No	No	3.98	3.59
NS	No	No	Yes	4.93	1.98
NS	Yes	No	No	6.95	0.83
NS	Yes	No	Yes	6.96	0.72
NS	No	Yes	No	2.68	2.36
NS	No	Yes	Yes	5.02	1.15
NS	Yes	Yes	No	5.33	0.90
NS	Yes	Yes	Yes	5.92	0.81

Table C.1: Checkpointing Data for `SMALL-IND`

Algorithm	Main Memory	Compressed	Staggered	Checkpoint Time (sec)	Checkpoint Overhead (sec)
SNS	No	No	-	4.44	4.50
SNS	Yes	No	-	7.38	2.50
SNS	No	Yes	-	3.32	3.47
SNS	Yes	Yes	-	6.55	2.23
CL	No	No	No	3.85	3.97
CL	No	No	Yes	4.08	3.84
CL	Yes	No	No	7.02	2.33
CL	Yes	No	Yes	7.01	2.13
CL	No	Yes	No	2.63	2.76
CL	No	Yes	Yes	4.09	2.92
CL	Yes	Yes	No	5.70	2.20
CL	Yes	Yes	Yes	5.32	2.19
NS	No	No	No	4.02	3.95
NS	No	No	Yes	5.13	4.33
NS	Yes	No	No	7.32	2.52
NS	Yes	No	Yes	6.89	2.36
NS	No	Yes	No	2.87	2.82
NS	No	Yes	Yes	4.75	3.86
NS	Yes	Yes	No	5.59	1.96
NS	Yes	Yes	Yes	5.47	3.33

Table C.2: Checkpointing Data for `SMALL-SYNC`

Algorithm	Main Memory	Compressed	Staggered	Checkpoint Time (sec)	Checkpoint Overhead (sec)
SNS	No	No	-	3.90	3.91
SNS	Yes	No	-	7.03	0.89
SNS	No	Yes	-	3.10	3.11
SNS	Yes	Yes	-	5.30	0.91
CL	No	No	No	3.58	3.52
CL	No	No	Yes	3.82	3.40
CL	Yes	No	No	6.98	0.89
CL	Yes	No	Yes	6.93	0.85
CL	No	Yes	No	2.57	2.51
CL	No	Yes	Yes	3.37	2.68
CL	Yes	Yes	No	5.30	0.91
CL	Yes	Yes	Yes	5.73	0.91
NS	No	No	No	3.87	3.57
NS	No	No	Yes	4.86	1.86
NS	Yes	No	No	7.05	1.01
NS	Yes	No	Yes	6.74	0.76
NS	No	Yes	No	2.86	2.49
NS	No	Yes	Yes	5.25	1.39
NS	Yes	Yes	No	5.30	0.91
NS	Yes	Yes	Yes	5.91	0.84

Table C.3: Checkpointing Data for `SMALL-IND-RAND`

Algorithm	Main Memory	Compressed	Staggered	Checkpoint Time (sec)	Checkpoint Overhead (sec)
SNS	No	No	-	21.30	21.32
SNS	Yes	No	-	33.21	4.21
SNS	No	Yes	-	5.52	5.54
SNS	Yes	Yes	-	8.47	4.16
CL	No	No	No	21.66	21.60
CL	No	No	Yes	24.22	22.07
CL	Yes	No	No	34.57	4.48
CL	Yes	No	Yes	33.65	4.20
CL	No	Yes	No	5.25	5.20
CL	No	Yes	Yes	9.02	5.11
CL	Yes	Yes	No	8.53	4.22
CL	Yes	Yes	Yes	12.22	4.37
NS	No	No	No	22.32	22.04
NS	No	No	Yes	27.70	11.34
NS	Yes	No	No	34.12	4.38
NS	Yes	No	Yes	34.70	3.89
NS	No	Yes	No	5.61	5.23
NS	No	Yes	Yes	23.90	5.58
NS	Yes	Yes	No	8.58	4.29
NS	Yes	Yes	Yes	25.01	5.46

Table C.4: Checkpointing Data for `MED-IND`

Algorithm	Main Memory	Compressed	Staggered	Checkpoint Time (sec)	Checkpoint Overhead (sec)
SNS	No	No	-	25.24	25.27
SNS	Yes	No	-	33.48	12.38
SNS	No	Yes	-	6.26	6.31
SNS	Yes	Yes	-	8.65	4.73
CL	No	No	No	24.08	24.10
CL	No	No	Yes	25.93	25.22
CL	Yes	No	No	34.33	13.24
CL	Yes	No	Yes	35.71	14.26
CL	No	Yes	No	5.67	5.69
CL	No	Yes	Yes	9.53	9.11
CL	Yes	Yes	No	8.45	4.51
CL	Yes	Yes	Yes	11.98	7.46
NS	No	No	No	24.27	24.42
NS	No	No	Yes	25.74	24.74
NS	Yes	No	No	33.13	12.55
NS	Yes	No	Yes	34.09	15.35
NS	No	Yes	No	5.75	5.88
NS	No	Yes	Yes	22.91	22.46
NS	Yes	Yes	No	8.38	4.70
NS	Yes	Yes	Yes	22.71	22.48

Table C.5: Checkpointing Data for `MED-SYNC`

Algorithm	Main Memory	Compressed	Staggered	Checkpoint Time (sec)	Checkpoint Overhead (sec)
SNS	No	No	-	24.36	24.37
SNS	Yes	No	-	33.98	4.33
SNS	No	Yes	-	28.80	28.81
SNS	Yes	Yes	-	38.92	8.84
CL	No	No	No	23.96	23.89
CL	No	No	Yes	25.27	23.14
CL	Yes	No	No	35.41	4.50
CL	Yes	No	Yes	33.69	4.22
CL	No	Yes	No	28.27	28.19
CL	No	Yes	Yes	34.89	28.35
CL	Yes	Yes	No	40.47	9.01
CL	Yes	Yes	Yes	44.02	9.18
NS	No	No	No	24.45	24.04
NS	No	No	Yes	30.06	12.17
NS	Yes	No	No	35.29	4.45
NS	Yes	No	Yes	35.34	3.98
NS	No	Yes	No	28.84	28.57
NS	No	Yes	Yes	55.49	15.89
NS	Yes	Yes	No	39.94	8.93
NS	Yes	Yes	Yes	54.59	8.36

Table C.6: Checkpointing Data for `MED-IND-RAND`

Algorithm	Main Memory	Compressed	Staggered	Checkpoint Time (sec)	Checkpoint Overhead (sec)
SNS	No	No	-	39.76	39.80
SNS	Yes	No	-	43.74	36.98
SNS	No	Yes	-	8.01	8.03
SNS	Yes	Yes	-	11.46	7.60
CL	No	No	No	39.80	39.65
CL	No	No	Yes	42.02	37.93
CL	Yes	No	No	43.80	37.03
CL	Yes	No	Yes	45.68	36.44
CL	No	Yes	No	8.02	7.86
CL	No	Yes	Yes	14.97	7.74
CL	Yes	Yes	No	11.28	7.57
CL	Yes	Yes	Yes	17.70	7.68
NS	No	No	No	39.71	39.35
NS	No	No	Yes	48.82	19.07
NS	Yes	No	No	43.62	37.27
NS	Yes	No	Yes	48.55	17.83
NS	No	Yes	No	8.21	7.84
NS	No	Yes	Yes	43.17	10.16
NS	Yes	Yes	No	11.38	7.59
NS	Yes	Yes	Yes	44.26	10.10

Table C.7: Checkpointing Data for `LARGE-IND`