## LIST OF FIGURES

Sr. No.	Figure Number	Figure Caption	Page No.
1.	Figure 1.1	Overview of embedded system for real-time applications	2
2.	Figure 1.2	Features of RTOS	3
3.	Figure 1.3	Classification of Memory Management Technique	5
4.	Figure 2.1	Structure for Sequential-Fit Allocators	22
5.	Figure 2.2	Structure of Buddy Allocator	28
6.	Figure 2.3	Structure of Dlmalloc	32
7.	Figure 2.4	Structure for Half-Fit	34
8.	Figure 2.5	Structure of TLSF	35
9.	Figure 2.6	Structure of tcmalloc	38
10.	Figure 2.7	Structure of Hoard	39
11.	Figure 2.8	Structure of Smart Memory Allocator	41
12.	Figure 3.1	SMP Architecture	43
13.	Figure 3.2	DmRT Structure for Small Block Allocation	46
14.	Figure 3.3	DmRT Structure for Normal Block Allocation	46
15.	Figure 3.4	Execution time of Memory allocators when Existing Allocators and DmRT allocate from Local Memory (Best Case) (SMP)	53
16.	Figure 3.5	Fragmentation & Request Satisfied of Memory allocators when Existing Allocators and DmRT allocate from Local Memory (Best Case) (SMP)	53
17.	Figure 3.6	Execution time of Memory allocators when Existing Allocators and DmRT allocate from Local Memory (Average Case) (SMP)	54
18.	Figure 3.7	Fragmentation & Request Satisfied of Memory allocators when Existing Allocators and DmRT allocate from Local Memory (Average Case) (SMP)	54
19.	Figure 3.8	Execution time of Memory allocators when Existing Allocators and DmRT allocate from Local Memory (Worst Case) (SMP)	55

20.	Figure 3.9	Fragmentation & Request Satisfied of Memory allocators when Existing Allocators and DmRT allocate from Local Memory (Worst Case) (SMP)	55
21.	Figure 4.1	NUMA Architecture	56
22.	Figure 4.2	Complex NUMA Structure (4 Nodes)	58
23.	Figure 4.3	Execution time of Memory allocators when Existing from Local and DmRT follows Local $\rightarrow$ Shared $\rightarrow$ Ideal (Best Case) (NUMA)	64
24.	Figure 4.4	Fragmentation & Request Satisfied of Memory allocators when Existing from Local and DmRT follows Local $\rightarrow$ Shared $\rightarrow$ Ideal (Best Case) (NUMA)	64
25.	Figure 4.5	Execution time of Memory allocators in Average case when Existing from Local and DmRT follows Local $\rightarrow$ Shared $\rightarrow$ Ideal (Average Case) (NUMA)	65
26.	Figure 4.6	Fragmentation & Request Satisfied of Memory allocators when Existing from Local and DmRT follows Local $\rightarrow$ Shared $\rightarrow$ Ideal (Average Case) (NUMA)	65
27.	Figure 4.7	Execution time of Memory allocators in Worst case for Existing from Local and DmRT follows Local $\rightarrow$ Shared $\rightarrow$ Ideal (Worst Case) (NUMA)	66
28.	Figure 4.8	Fragmentation & Request Satisfied of Memory allocators when Existing from Local and DmRT follows Local $\rightarrow$ Shared $\rightarrow$ Ideal (Worst Case) (NUMA)	66
29.	Figure 4.9	Execution time of Memory allocators when Existing from Local and DmRT from Ideal (Best Case) (NUMA)	67
30.	Figure 4.10	Fragmentation & Request Satisfied of Memory allocators when Existing from Local and DmRT from Ideal (Best Case) (NUMA)	67
31.	Figure 4.11	Execution time of Memory allocators Existing from Local and DmRT from Ideal (Average Case) (NUMA)	68
32.	Figure 4.12	Fragmentation & Request Satisfied of Memory allocators when Existing from Local and DmRT from Ideal (Average Case) (NUMA)	68
33.	Figure 4.13	Execution time of Memory allocators when Existing from Local and DmRT from Ideal (Worst Case) (NUMA)	69
34.	Figure 4.14	Fragmentation & Request Satisfied of Memory allocators when Existing from Local and DmRT from Ideal (Worst Case) (NUMA)	69
35.	Figure 4.15	Execution time of Memory allocators when Existing and DmRT both from Ideal (Best Case) (NUMA)	70

36.	Figure 4.16	Fragmentation & Request Satisfied of Memory allocators when Existing and DmRT both from Ideal (Best Case) (NUMA)	70
37.	Figure 4.17	Execution time of Memory allocators when Existing and DmRT both from Ideal (Average Case) (NUMA)	71
38.	Figure 4.18	Fragmentation & Request Satisfied of Memory allocators when Existing and DmRT both from Ideal (Average Case) (NUMA)	71
39.	Figure 4.19	Execution time of Memory allocators when Existing and DmRT both from Ideal (Worst Case) (NUMA)	72
40.	Figure 4.20	Fragmentation & Request Satisfied of Memory allocators when Existing and DmRT both from Ideal (Worst Case) (NUMA)	72
41.	Figure 4.21	Execution time of Memory allocators when Existing and DmRT follow Local $\rightarrow$ Shared $\rightarrow$ Ideal (Best Case) (NUMA)	73
42.	Figure 4.22	Fragmentation & Request Satisfied of Memory allocators when Existing and DmRT follow Local $\rightarrow$ Shared $\rightarrow$ Ideal (Best Case) (NUMA)	73
43.	Figure 4.23	Execution time of Memory allocators when Existing and DmRT follow Local $\rightarrow$ Shared $\rightarrow$ Ideal (Average Case) (NUMA)	74
44.	Figure 4.24	Fragmentation & Request Satisfied of Memory allocators when Existing and DmRT follow Local $\rightarrow$ Shared $\rightarrow$ Ideal (Average Case) (NUMA)	74
45.	Figure 4.25	Execution time of Memory allocators when Existing and DmRT follow Local $\rightarrow$ Shared $\rightarrow$ Ideal (Worst Case) (NUMA)	75
46.	Figure 4.26	Fragmentation & Request Satisfied of Memory allocators when Existing and DmRT follow Local $\rightarrow$ Shared $\rightarrow$ Ideal (Worst Case) (NUMA)	75
47.	Figure 5.1	The welcome screen of MemSimRT	76
48.	Figure 5.2	The welcome screen of SMP	77
49.	Figure 5.3	Statistics of individual Memory Allocator	78
50.	Figure 5.4	Memory block allocation as per request by DmRT	78
51.	Figure 5.5	Statistics of all memory allocators	79
52.	Figure 5.6	Welcome screen of NUMA	80
53.	Figure 5.7	All Processors with its memory utilization in (%)	81
54.	Figure 5.8	Memory block allocation Log	82