List of Figures

Figure 1-1.	CODE Primitive Node.	4
Figure 2-1.	A CODE Program.	11
Figure 2-2.	UC Node Attribute Form.	12
Figure 2-3.	A Dynamic Computation Structure.	17
Figure 2-4.	Another Integration Program.	18
Figure 2-5.	All CODE Node Types.	19
Figure 3-1.	An Example UC Node.	22
Figure 3-2.	Binding Two UC Nodes.	29
Figure 3-3.	A More Complex Example of UC Binding.	30
Figure 3-4.	A Dynamic Graph Structure.	30
Figure 3-5.	CODE Graph for Dynamic Structure.	31
Figure 3-6.	Name Sharing Relation Node Example.	33
Figure 3-7.	Node Types in Graph Interface.	35
Figure 3-8.	Call Node Icon.	36
Figure 3-9.	VectMult Graph.	37
Figure 3-10.	Main Graph.	39
Figure 3-11.	Call Node Attribute Form.	39
Figure 3-12.	Example Replicated Call.	41
Figure 3-13.	Scopes in CODE.	42
Figure 4-1.	Example UC Node.	46
Figure 4-2.	Two-Graph Program Showing Template TUIDs.	48
Figure 4-3.	States Affected by a UC Node.	55
Figure 5-1.	Partitioned Lower Triangular Matrix.	58
Figure 5-2.	Block Triangular Solver Dataflow.	59
Figure 5-3.	BTS Main Graph.	60
Figure 5-4.	Graph ReadSystem.	60
Figure 5-5.	Graph DoBTS.	61

Figure 5-6. Block Triangular Solver Speedups. 64
Figure 5-7. Example Set of Particles and Quad Tree. 65
Figure 5-8. Barnes Graph main. 67
Figure 5-9. Barnes Graph DoBarnes. 68
Figure 5-10. Barnes-Hut Computation Structure. 68
Figure 5-11. Barnes-Hut Speedup for 80 Particles. 73
Figure 5-12. Barnes-Hut Speedup for 40 Particles. 74
Figure 6-1. Sequential Versus Parallel Programming. 76
Figure 6-2. Computation Graph of Example Program. 77
Figure 6-3. Locality Requirements. 77
Figure 7-1. Phases in Translation. 94
Figure 7-2. Translation Phase 5: Linking. 95
Figure 7-3. GUIDE Services. 97
Figure 7-4. Steps in AST Creation. 98
Figure 7-5. First Few Levels in AST Hierarchy. 100
Figure 7-6. Virtual Method for Traversing the AST. 102
Figure 7-7. Symbol Table Example. 103
Figure 7-8. Example Special Case Structure. 106
Figure 7-9. Fan Optimization. 106
Figure 7-10. Fan Performance Test Program. 107
Figure 7-11. Translation Methods in AST. 110
Figure 7-12. AST Nodes Place Text into Output Files. 111
Figure 7-13. Sequent Symmetry Architecture. 112
Figure 7-14. Example Structured File. 113
Figure 7-15. Structure of Makefile. 114
Figure 7-16. Makefile Hierarchy. 115
Figure 7-17. Division of Function in Sequent Translation. 118
Figure 7-18. Structures for UC Nodes. 119
Figure 7-19. Use of DataLock. 121

Figure 7-20. Example Dataflow Send. 122
Figure 7-21. Sequent Node Scheduler. 126
Figure 7-22. Call Tree showing Address Maps. 128
Figure 7-23. Graphs G1 and G2. 129
Figure 7-24. Call with a Creation Parameter. 130
Figure 7-25. Files Linked on Sequent. 135
Figure 7-26. Flow Control. 137
Figure 7-27. Example of Potential Unbounded Memory Use. 138
Figure 7-28. One-Buffers Lead to Deadlock. 139
Figure 7-29. Example Program. 141
Figure 7-30. Three Constraint Functions. 146
Figure 7-31. Functions Defined by Listing Marked Frontier Nodes. 148
Figure 7-32. Pipeline Example. 150
Figure 7-33. Proposed Firing Rules for a Graph. 150
Figure 8-1. Node Icons in Prototype. 153
Figure 8-2. Potential Deadlock Problem. 154
Figure 8-3. CODE Program Fragment. 155
Figure 8-4. UC Node with FIFO Port Queue. 155
Figure 8-5. Optimized UC Node Implementation. 156
Figure 8-6. Laplace Algorithm. 156
Figure 8-7. Laplace Graph. 157
Figure 8-8. Laplace Program Speedups. 158
Figure 8-9. Prototype BTS Speedups. 159
Figure 9-1. An Example Parallax graph. 164
Figure 9-2. A Sample D.D.R. Program. 165
Figure 9-3. A HeNCE Graph. 166
Figure 9-4. Structure Specified by HeNCE Graph. 166
Figure 10-1. Ellipses in a Graphical Interface. 170
Figure B-1. Specification of Node Translated. 183