Table of Contents

Dedication 1
Acknowledgment 2
Foreword 5
A Thought Leader's Perspective: Power and Responsibility 6
Introduction 8
What makes an AI system an "agent"? 12

Part One

1. Prompt Chaining 21
2. Routing 34
3. Parallelization 48
4. Reflection 63
5. Tool Use 77
6. Planning 98
7. Multi-Agent 111

Part Two

8. Memory Management 130
9. Learning and Adaptation 152
10. Model Context Protocol (MCP) 165
11. Goal Setting and Monitoring 181

Part Three

12. Exception Handling and Recovery 194
13. Human-in-the-Loop 202
14. Knowledge Retrieval (RAG) 211

Part Four

15. Inter-Agent Communication (A2A) 229
16. Resource-Aware Optimization 244
17. Reasoning Techniques 260
18. Guardrails/Safety Patterns 284
19. Evaluation and Monitoring 304
20. Prioritization 323
21. Exploration and Discovery 333

Appendix

Appendix A Advanced Prompting Techniques 347
Appendix B AI Agentic ....: From GUI to Real world environment 376
Appendix C Quick overview of Agentic Frameworks 383
Appendix D Building an Agent with AgentSpace (on-line only) 391
Appendix E AI Agents on the CLI (online) 397
Appendix F Under the Hood: An Inside Look at the Agents' Reasoning Engines 402
Appendix G Coding agents 417

Conclusion 423
Glossary 428
Index of Terms 431