



<b>Chapter 1 : Introduction</b>	<b>1-1 to 1-27</b>
1.1 What is HCI? .....	1-1
1.1.1 Introduction to HCI.....	1-1
1.1.2 The Human .....	1-2
1.1.3 The Computer.....	1-2
1.1.4 Models of Interaction .....	1-10
1.2 Disciplines Involved in HCI.....	1-11
1.3 Is HCI Study Important? .....	1-16
1.4 The Psychology of Everyday Things .....	1-19
1.4.1 The Complexity of Modern Devices.....	1-19
1.5 Principles of HCI .....	1-20
1.5.1 Shneiderman’s 8 Golden Rule .....	1-20
1.5.2 Don Norman’s Principle of Design.....	1-21
1.5.3 Nielson’s 10 Heuristics .....	1-22
1.5.4 Few Other Characteristics and Principles .....	1-23
1.6 User-centred Design .....	1-24
1.6.1 User-Centred Design Methods .....	1-25
1.6.2 Principles of UCD .....	1-26
<b>Chapter 2 : Understanding the Human and Human Interaction</b>	<b>2-1 to 2-22</b>
2.1 Introduction .....	2-1
2.2 Input Output Channels.....	2-1
2.3 Visual Channel.....	2-2
2.3.1 Vision.....	2-2
2.3.2 Illustration of the Capability and Limits of Visual Perception and Processing.....	2-6
2.3.3 Reading.....	2-7
2.4 Auditory Channel.....	2-8
2.4.1 Hearing.....	2-8
2.4.2 The Human Ear .....	2-8



2.5	Haptic Channel.....	2-9
2.5.1	Touch.....	2-9
2.5.2	Kinesthesia.....	2-9
2.5.3	Movement .....	2-9
2.6	Human Memory.....	2-9
2.6.1	Sensory Memory .....	2-10
2.6.2	Short Term Memory (STM) .....	2-12
2.6.3	Long Term Memory.....	2-13
2.6.4	Retrieval of Information in Long Term Memory.....	2-14
2.6.5	Theory of Forgetting.....	2-15
2.7	Thinking : Reasoning and Problem Solving.....	2-16
2.7.1	Reasoning.....	2-16
2.7.2	Skill Acquisition.....	2-18
2.8	Human Emotions .....	2-19
2.8.1	Emotion Influences Human Capabilities.....	2-20
2.8.2	Individual Differences.....	2-20
2.8.3	Psychology and Design.....	2-21
<b>Chapter 3 : HCI Models and Theories</b>		<b>3-1 to 3-34</b>
3.1	Models of Interaction .....	3-1
3.1.1	Donald Norman’s Seven Stages of Action.....	3-1
3.2	The Interaction Framework.....	3-4
3.2.1	Ergonomics.....	3-5
3.2.2	Interaction Style.....	3-7
3.2.3	WIMP Interface.....	3-10
3.2.4	Select the Proper Kind Windows.....	3-19
3.2.5	Components of Windows.....	3-20
3.2.6	Select a Proper Device Based Controls .....	3-25
3.3	Interactivity.....	3-26
3.4	The Context of the Interaction .....	3-26



3.5	User Experience .....	3-28
3.5.1	Comparison between Cell Phone and Smart Phone .....	3-31
3.6	Paradigms of Interactions.....	3-31
<b>Chapter 4 : Design Process</b>		<b>4-1 to 4-27</b>
4.1	What is Design ? .....	4-1
4.2	What is Interaction Design ? .....	4-2
4.2.1	Interaction Design Process .....	4-3
4.2.2	Interaction Styles.....	4-3
4.2.2(A)	Advantages and Disadvantages of Command Language.....	4-4
4.2.2(B)	Advantages and Disadvantages of Form Filling .....	4-4
4.2.2(C)	Advantages and Disadvantages of Menu Selection.....	4-4
4.2.2(D)	Advantages and Disadvantages of Direct Manipulation .....	4-5
4.3	The Software Design Process .....	4-8
4.3.1	Software Design Process Principles.....	4-8
4.4	User Focus.....	4-9
4.4.1	Know Your Users .....	4-9
4.4.2	Persona.....	4-10
4.4.3	Cultural Probes .....	4-11
4.5	Scenarios.....	4-11
4.5.1	Types of Scenarios .....	4-12
4.6	Navigation Design .....	4-14
4.7	Screen Design .....	4-16
4.8	Prototyping Techniques.....	4-18
4.8.1	Prototypes in HCI .....	4-18
4.8.2	Prototype Types.....	4-18
4.8.3	Prototypes as Design Artifacts.....	4-19
4.8.4	Prototype Dimensions .....	4-19
4.8.5	Rapid Prototyping.....	4-21
4.8.6	Hill Climbing Approach.....	4-23



4.9	Wire-Framing.....	4-24
4.10	Understanding the UI Layer and Its Execution Framework.....	4-25
4.11	Model-View-Controller (MVC) Framework.....	4-26
<b>Chapter 5 : HCI Guidelines and Evaluation Techniques</b>		<b>5-1 to 5-36</b>
5.1	Introduction .....	5-1
5.2	Principles that Support Usability.....	5-1
5.2.1	Learnability .....	5-3
5.2.2	Flexibility.....	5-5
5.2.3	Robustness.....	5-7
5.3	Design Standards.....	5-9
5.4	Design Guidelines.....	5-10
5.5	Golden Rules and Heuristics .....	5-11
5.5.1	Shneiderman’s Eight Golden Rules of Interface Design .....	5-11
5.5.2	Norman’s Seven Principles for Transforming Difficult Tasks into Simple Ones.....	5-12
5.6	Using Toolkits.....	5-13
5.7	User Interface Management System (UIMS).....	5-14
5.7.1	UIMS as a Conceptual Architecture .....	5-14
5.7.2	UIMS Conceptual architectures .....	5-15
5.7.3	Differences between PAC and MVC.....	5-16
5.7.4	UIMS Implementation Considerations.....	5-17
5.8	Goals of Evaluation .....	5-17
5.9	Evaluation Criteria.....	5-17
5.10	Evaluation Through Expert Analysis .....	5-19
5.10.1	Cognitive Walkthrough.....	5-19
5.10.2	Heuristic Evaluation.....	5-20
5.10.3	Model-based Evaluation.....	5-23
5.10.4	Based on Prior Studies.....	5-23
5.11	Evaluation Through User Participation.....	5-23
5.11.1	Styles of Evaluation .....	5-25



5.11.2	Empirical Methods : Experimental Evaluation Design.....	5-26
5.11.3	Observational Techniques .....	5-28
5.11.4	Query Techniques .....	5-30
5.11.5	Evaluation through Physiological Responses.....	5-32
5.12	Choosing an Evaluation Method.....	5-33
5.12.1	Factors Distinguishing Evaluation Techniques.....	5-33
5.12.2	A Classification of Evaluation Techniques .....	5-35
<b>Chapter 6 : Future Trends</b>		<b>6-1 to 6-37</b>
6.1	Introduction .....	6-1
6.2	Goal and Task Hierarchy Model .....	6-2
6.2.1	Issues for Goal Hierarchies .....	6-3
6.2.2	Techniques for Goal and Task Hierarchies .....	6-3
6.2.3	Problems and Extensions of Goal Hierarchies .....	6-9
6.3	Linguistic Model.....	6-9
6.3.1	BNF (Backus-Naur Form).....	6-10
6.3.2	Task Action Grammar.....	6-11
6.4	Physical and Device Models .....	6-12
6.4.1	The Keystroke Level Model (KLM) .....	6-12
6.4.2	3-State Model.....	6-14
6.5	Cognitive Architectures or Architecture Model.....	6-15
6.5.1	The Problem Space Model.....	6-16
6.5.2	Interacting Cognitive Subsystems(ICS) .....	6-16
6.6	Hierarchical Task Analysis (HTA) .....	6-17
6.7	Uses of Task Analysis.....	6-24
6.8	Diagrammatic Dialog Design Notations .....	6-25
6.8.1	State Transition Networks (STN) .....	6-26
6.8.2	Petri Nets.....	6-29
6.8.3	State Charts .....	6-30
6.8.4	Flow Charts.....	6-31



---

6.8.5	Jackson Structured Design (JSD).....	6-32
6.9	Computer Mediated Communication.....	6-32
6.9.1	Email and Bulletin Boards.....	6-33
6.9.2	Structured Message Systems .....	6-34
6.9.3	Informal Text Messaging Systems.....	6-34
6.9.4	Video Conferences and Communication .....	6-34
6.9.5	Virtual Collaborative Environments .....	6-34
6.10	Ubiquitous Computing .....	6-34
6.10.1	Defining the Appropriate Physical Interaction Experience.....	6-35
6.10.2	Application Themes for Ubicomp.....	6-36
6.10.3	Understanding Interaction in Ubicomp.....	6-37
6.10.4	Evaluation Challenges for Ubicomp .....	6-37
6.11	Finding things on Web and Future of HCI .....	6-37

---