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Nota di contenuto	Spoken, Multilingual and Multimodal Dialogue Systems; Contents; Preface; 1 Introduction to Dialogue Systems; 1.1 Human-Computer Interaction and Speech Processing; 1.2 Spoken Dialogue Systems; 1.2.1 Technological Precedents; 1.3 Multimodal Dialogue Systems; 1.4 Multilingual Dialogue Systems; 1.5 Dialogue Systems Referenced in This Book; 1.6 Area Organisation and Research Directions; 1.7 Overview of the Book; 1.8 Further Reading; 2 Technologies Employed to Set Up Dialogue Systems; 2.1 Input Interface; 2.1.1 Automatic Speech Recognition; 2.1.2 Natural Language Processing 2.1.3 Face Localisation and Tracking 2.1.4 Gaze Tracking 2.1.5 Lip-reading Recognition 2.1.6 Gesture Recognition 2.1.7 Handwriting Recognition 2.2 Multimodal Processing 2.2.1 Multimodal Data Fusion 2.2.2 Multimodal Data Storage 2.2.3 Dialogue Management 2.2.4 Task Module 2.2.5 Database Module 2.2.6 Response Generation 2.3 Output Interface 2.3.1 Graphic Generation 2.3.2 Natural Language

Generation; 2.3.3 Speech Synthesis; 2.3.4 Sound Generation; 2.3.5 Tactile/Haptic Generation; 2.4 Summary; 2.5 Further Reading; 3 Multimodal Dialogue Systems; 3.1 Benefits of Multimodal Interaction 3.1.1 In Terms of System Input3.1.2 In Terms of System Processing; 3.1.3 In Terms of System Output; 3.2 Development of Multimodal Dialogue Systems; 3.2.1 Development Techniques; 3.2.2 Data Fusion; 3.2.3 Architectures of Multimodal Systems; 3.2.4 Animated Agents; 3.2.5 Research Trends; 3.3 Summary; 3.4 Further Reading; 4 Multilingual Dialogue Systems; 4.1 Implications of Multilinguality in the Architecture of Dialogue Systems; 4.1.1 Consideration of Alternatives in Multilingual Dialogue Systems; 4.1.2 Interlingua Approach; 4.1.3 Semantic Frame Conversion Approach 4.1.4 Dialogue-Control Centred Approach4.2 Multilingual Dialogue Systems Based on Interlingua; 4.2.1 MIT Voyager System; 4.2.2 MIT Jupiter System; 4.2.3 KIT System; 4.3 Multilingual Dialogue Systems Based on Web Applications; 4.3.1 Requirements for Practical Multilingual Dialogue Systems; 4.3.2 Dialogue Systems Based on Web Applications; 4.3.3 Multilingual Dialogue Systems Based on the MVC Framework; 4.3.4 Implementation of Multilingual Voice Portals; 4.4 Summary; 4.5 Further Reading; 5 Dialogue Annotation, Modelling and Management; 5.1 Dialogue Annotation 5.1.1 Annotation of Spoken Dialogue Corpora5.1.2 Annotation of Multimodal Dialogue Corpora; 5.2 Dialogue Modelling; 5.2.1 State-Transition Networks; 5.2.2 Plans; 5.3 Dialogue Management; 5.3.1 Interaction Strategies; 5.3.2 Confirmation Strategies; 5.4 Implications of Multimodality in the Dialogue Management; 5.4.1 Interaction Complexity; 5.4.2 Confirmations; 5.4.3 Social and Emotional Dialogue; 5.4.4 Contextual Information; 5.4.5 User References; 5.4.6 Response Generation; 5.5 Implications of Multilinguality in the Dialogue Management 5.5.1 Reference Resolution in Multilingual Dialogue Systems

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#### Sommario/riassunto

Dialogue systems are a very appealing technology with an extraordinary future. Spoken, Multilingual and Multimodal Dialogues Systems: Development and Assessment addresses the great demand for information about the development of advanced dialogue systems combining speech with other modalities under a multilingual framework. It aims to give a systematic overview of dialogue systems and recent advances in the practical application of spoken dialogue systems. Spoken Dialogue Systems are computer-based systems developed to provide information and carry out simple tasks using speech as the

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