# Table of Contents

Preface ....................................................................................................................................................xiv

Acknowledgment ........................................................................................................................................xxi

Chapter 1
Overview: Important Issues for Researchers and Practitioners Using Computer Synthesized Speech as an Assistive Aid........................................................................................................1
  
  *John W. Mullennix, University of Pittsburgh at Johnstown, USA*
  
  *Steven E. Stern, University of Pittsburgh at Johnstown, USA*

Section 1
Overview of Computer Synthesized Speech

Chapter 2
From Wood to Bits to Silicon Chips: A History of Developments in Computer Synthesized Speech ..................................................................................................................................................9

  *Debbie A. Rowe, Rensselaer Polytechnic Institute, USA*

Chapter 3
Digital Speech Technology: An Overview ................................................................................................28

  *H.S. Venkatagiri, Iowa State University, USA*

Section 2
Emerging Technologies

Chapter 4
Humanizing Vox Artificialis: The Role of Speech Synthesis in Augmentative and Alternative Communication ..............................................................................................................................50

  *D. Jeffery Higginbotham, University at Buffalo, USA*
Chapter 5
Advances in Computer Speech Synthesis and Implications for Assistive Technology ....................... 71
H. Timothy Bunnell, Alfred I. duPont Hospital for Children, USA
Christopher A. Pennington, AgoraNet, Inc., USA

Chapter 6
Building Personalized Synthetic Voices for Individuals with Dysarthria Using the HTS Toolkit ........ 92
Sarah Creer, University of Sheffield, UK
Phil Green, University of Sheffield, UK
Stuart Cunningham, University of Sheffield, UK
Junichi Yamagishi, University of Edinburgh, UK

Chapter 7
Speech Technologies for Augmented Communication ......................................................................... 116
Gérard Bailly, CNRS/Universities of Grenoble, France
Pierre Badin, CNRS/Universities of Grenoble, France
Denis Beaufemps, CNRS/Universities of Grenoble, France
Frédéric Elisei, CNRS/Universities of Grenoble, France

Section 3
Specific Applications

Chapter 8
CSS and Children: Research Results and Future Directions ............................................................ 130
Kathryn D.R. Drager, The Pennsylvania State University, USA
Joe Reichle, University of Minnesota, USA

Chapter 9
Systematic Review of Speech Generating Devices for Aphasia ....................................................... 148
Rajinder Koul, Texas Tech University, USA
Diana Petroi, Texas Tech University, USA
Ralf Schlosser, Northeastern University, USA

Chapter 10
Are Speech-Generating Devices Viable AAC Options for Adults with Intellectual Disabilities? ...... 161
Dean Sutherland, University of Canterbury, New Zealand
Jeff Sigafoos, Victoria University of Wellington, New Zealand
Ralf W. Schlosser, Northeastern University, USA
Mark F. O’Reilly, The University of Texas at Austin, USA
Giulio E. Lancioni, University of Bari, Italy
Chapter 11
Synthetic Speech Perception in Individuals with Intellectual and Communicative Disabilities
................................. 177
  Rajinder Koul, Texas Tech University, USA
  James Dembowski, Texas Tech University, USA

Chapter 12
The Use of Synthetic Speech in Language Teaching Tools: Review and a Case Study
........................................ 188
  Oscar Saz, University of Zaragoza, Spain
  Eduardo Lleida, University of Zaragoza, Spain
  Victoria Rodríguez, Vienna International School, Austria
  W.-Ricardo Rodríguez, University of Zaragoza, Spain
  Carlos Vaquero, University of Zaragoza, Spain

Section 4
Social Factors

Chapter 13
Attitudes toward Computer Synthesized Speech
........................................................... 205
  John W. Mullennix, University of Pittsburgh at Johnstown, USA
  Steven E. Stern, University of Pittsburgh at Johnstown, USA

Chapter 14
Stereotypes of People with Physical Disabilities and Speech Impairments as Detected
by Partially Structured Attitude Measures
.............................................................. 219
  Steven E. Stern, University of Pittsburgh at Johnstown, USA
  John W. Mullennix, University of Pittsburgh at Johnstown, USA
  Ashley Davis Fortier, University of Pittsburgh at Johnstown, USA
  Elizabeth Steinhauser, Florida Institute of Technology, USA

Section 5
Case Studies

Chapter 15
A Tale of Transitions: The Challenges of Integrating Speech Synthesis
in Aided Communication
.............................................................. 234
  Martine Smith, Trinity College Dublin, Ireland
  Janice Murray, Manchester Metropolitan University, England
  Stephen von Tetzchner, University of Oslo, Norway
  Pearl Langan, Trinity College Dublin, Ireland
Chapter 16
Tossed in the Deep End: Now What?! ................................................................. 257
   Jeff Chaffee, Easter Seals Society, Ohio, USA

Compilation of References ................................................................................ 270

About the Contributors ....................................................................................... 307

Index ..................................................................................................................... 315