
Contents

| | |
|----------------------|------|
| Preface..... | xiii |
| Acknowledgments..... | xv |
| Editor | xvii |
| Contributors | xix |

PART I The Human Foot

| | |
|---------------------------------------------------------------------------------------|----|
| Chapter 1 Foot Structure and Anatomy | 3 |
| <i>Ma Xiao, Yan Luximon, and Ameersing Luximon</i> | |
| Chapter 2 Foot Morphology | 19 |
| <i>Inga Krauss and Marlene Mauch</i> | |
| Chapter 3 Foot Characteristics and Related Empirical Models..... | 47 |
| <i>Shuping Xiong, Asanka S. Rodrigo, and Ravindra S. Goonetilleke</i> | |
| Chapter 4 Foot Posture Index and Its Implications for Footwear Selection | 79 |
| <i>Anthony C. Redmond</i> | |

PART II Scanning and Processing

| | |
|----------------------------------------------------------------------|-----|
| Chapter 5 3D Shape Capture of Human Feet and Shoe Lasts | 113 |
| <i>Carl G. Saunders and Jeffrey Chang</i> | |
| Chapter 6 3D Surface Scanning..... | 127 |
| <i>Sudhakar Rajulu and Brian D. Corner</i> | |
| Chapter 7 Three-Dimensional Data Processing Techniques | 147 |
| <i>Jianhui Zhao, Yihua Ding, and Ravindra S. Goonetilleke</i> | |

PART III Footwear Design

- Chapter 8** Capturing Footwear Needs for Delighting Customers..... 177
Emily Y.L. Au and Ravindra S. Goonetilleke
- Chapter 9** Shoe-Last Design and Development 193
Ameersing Luximon and Yan Luximon
- Chapter 10** Computer-Aided Design of Footwear 213
Ajay Joneja and Fan Sai Kit
- Chapter 11** High-Heeled Shoes..... 261
Makiko Kouchi
- Chapter 12** Footbed Design 279
Ravindra S. Goonetilleke and Thilina W. Weerasinghe
- Chapter 13** Design of Insoles 291
Tammy M. Owings and Georgeanne Botek
- Chapter 14** Design of Custom Shoe Lasts for Challenging Feet 309
Carl G. Saunders, Claudia Kieserling, and Johan Steenwyk
- Chapter 15** Finite Element Analysis Methods in Footwear Design..... 321
Philip Azariadis
- Chapter 16** Footwear—The Forgotten Treatment—Clinical Role
of Footwear 341
Helen Branthwaite, Nachiappan Chockalingam, and Aoife Healy

PART IV Testing

- Chapter 17** Foot Pressure Measurements..... 359
Ewald M. Hennig

- Chapter 18** Plantar Pressure Analysis..... 377
Noël Keijsers
- Chapter 19** Virtual Shoe Test Bed 409
*Sandra Alemany, José Olaso, Sergio Puigcerver,
 and Juan Carlos González*
- Chapter 20** Measuring the Motion Control Properties of Footwear:
 Assessment of Footwear and Foot Function Should Be
 Harmonized..... 437
Stephen Urry, Lloyd Reed, and William Gordon

PART V *Footwear Effects*

- Chapter 21** Footwear Effects on Running Kinematics 457
Joseph Hamill, Allison H. Gruber, and Ross H. Miller
- Chapter 22** Footwear Influences on Running Biomechanics..... 475
*Gordon A. Valiant, Allison R. Medellin, Lorilynn Bloomer,
 and Sharna M. Clark-Donovan*
- Chapter 23** Effects of Footwear on Muscle Function 489
George S. Murley and Karl Landorf
- Chapter 24** Postural Stability Measurement: Implications for Footwear
 Interventions..... 513
Anna Lucy Hatton and Keith Rome
- Chapter 25** Footwear, Balance, and Falls in the Elderly..... 535
Jasmine C. Menant and Stephen R. Lord

PART VI *Activity-Specific Footwear*

- Chapter 26** Soccer Shoe Design and Its Influence on Player's Performance..... 561
Ewald M. Hennig and Katharina Althoff

- Chapter 27** Footwear for Preventing Acute Sport-Related Ankle Ligamentous Sprain Injury..... 577
Daniel Tik-Pui Fong, Kai-Ming Chan, and Kam-Ming Mok

- Chapter 28** Kinematics Analysis of Walking with Negative-Heeled Shoes on Treadmills 595
Youlian Hong and Jing Xian Li

- Chapter 29** Athletic Footwear Research by Industry and Academia..... 605
Thorsten Sterzing, Wing Kai Lam, and Jason Tak-Man Cheung

PART VII Customization

- Chapter 30** Mass Customization and Footwear 625
Chenjie Wang and Mitchell M. Tseng

- Chapter 31** Strategic Capabilities to Implement Mass Customization of Athletic Footwear: The Example of Miadidas..... 643
Frank Piller, Evalotte Lindgens, and Frank Steiner

- Chapter 32** selve Model: Custom Shoes in the Twenty-First Century 663
Claudia Kieserling

- Chapter 33** Footwear Customization for Manufacturing Sustainability 673
Claudio R. Boër and Paolo Pedrazzoli

- Index**..... 689