



Intelligent Wearable **INTERFACES**

Yangsheng Xu • Wen Jung Li • Ka Keung Lee

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INTELLIGENT WEARABLE INTERFACES

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PREFACE

When I was young, my favorite Chinese classic novel book was *Outlaws of the Marsh* (*Shui Hu Zhuan*). The story was about how 108 heroes banded together on a marsh-girt mountain in what today is Shandong Province in China, became leaders of an outlaw army of thousands, and fought brave and resourceful battles against pompous, heartless tyrants. The most interesting hero, in my mind, is the “Flyer on Grass” (*Cao Shang Fei*). With his “light body skill” (*Qing Gong*), he could walk on tree leaves, grass, and on water as if flying. Years later, I really had a chance to witness such martial art being performed by well-trained *kung fu* masters. One observation I made then was that the *kung fu* master could perform vertical jumps of a height many times that of his human body with the help of the tree leaves. However, he simply could not perform the acrobatic task while the leaves were not available. Then I started to think, as scientists, would it be possible for us to design and build tools or interfaces that allow humans to accomplish extremely difficult tasks that were impossible with no such interfaces? Would it be more realistic and convenient to develop such interfaces, instead of making robots, for assisting human beings to accomplish tasks otherwise impossible?

This book is a collection of such efforts we made in the Chinese University of Hong Kong. We call this research area Intelligent Wearable Interfaces. Namely, we would like to develop interfaces with a certain level of intelligence that humans can wear for enhancing their capabilities in communications, actions, monitoring, and control.

It is the our hope that this book will be of interest to human–machine interface designers and engineers who study and develop interface systems designed for wearable applications. As mobile computing, sensing technology, and artificial intelligence become more advanced and their use more widespread, we feel that the subject area intelligent wearable interfaces will grow in importance.

I would like to acknowledge the support by grants from the Research Grant Council of the Hong Kong Special Administration Region (Project CUHK 3/98C, CUHK 4197/OOE, CUHK 4228/OIE, CUHK 43 17/02E, CUHK 4202/04E), and by the Hong Kong Innovation and Technology Fund under Grant ITS/140/01.

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WEN J. LI

Our book reviewers have contributed their advice in making critical suggestions. We are also grateful for the effort of the editors and staff (George Telecki, Kellsee Chu, and Rachel Witmer, in particular) at Wiley-Interscience throughout the development of this book.

This book could not have happened without the support from our research and development team. The work on intelligent translation glasses presented in Chapter 3 is mainly performed by Mr. Xi Shi. Mr. Cedric K. H. Law's work laid the foundation of intelligent cap interface for wheelchair control, and the work is presented in Chapter 4. Mr. Bufu Huang, Miss Meng Chen, and Mr. Weizhong Ye developed the prototypes of the intelligent shoe, which form the contents in Chapter 5. We also wish to thank Mr. Xiaoning Meng and Mr. Huihuan Qian for their editorial assistance.

KA KEUNG LEE

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CONTENTS

List of Figures	xi
List of Tables	xvii
Preface	xix
1. Introduction	1
1.1 The Intelligent Wearable Interface	1
1.2 Learning from Demonstration	2
2. Network Architecture for Wearable Robots	5
2.1 Introduction	5
2.2 Wearable Robots and Interactions	7
2.3 Wearable Robot Design	8
2.4 Distributed Service-Based Architecture	10
2.4.1 Extension to the Jini Model	12
2.4.2 The Matching Service	17
2.5 Application Scenario	21
2.6 Related Works	25
2.7 Conclusion	27
3. Wearable Interface for Automatic Language Translation	31
3.1 Introduction	31
3.2 System Architecture	33
3.3 Text Detection Algorithm	34
3.3.1 Demands of Text Detection Algorithm	34
3.3.2 Intrinsic Characteristic of a Character	35
3.3.3 CIC-Based Text Detection Algorithm	35
3.3.4 Combine Line Segments into a Character	38
3.4 Image Cutting, Rotation, and Binarization	39
3.4.1 Image Cutting and Rotation	39
3.4.2 Image Binarization	39
3.5 Real-time Translation	41
3.6 Conclusion	41

4. Intelligent Cap Interface for Wheelchair Control	43
4.1 Introduction	43
4.2 Electromyography and Electrooculography	45
4.3 Approach	45
4.4 Interface	47
4.4.1 Hardware	47
4.4.2 Implementation	49
4.5 Experimental Study	51
4.5.1 Doorways (A–B)	52
4.5.2 U-turning (B–C–B)	53
4.5.3 General Path (C–D)	53
4.6 Conclusion	54
5. Intelligent Shoes for Human–Computer Interface	56
5.1 Introduction	56
5.2 Hardware Design	58
5.2.1 Sensing the Parameters Inside the Shoe	59
5.2.2 Gathering Information from the Sensors	60
5.2.3 Wireless Communication	60
5.2.4 Data Visualization	61
5.3 Three Applications of the Intelligent Shoes	61
5.3.1 Intelligent Shoes for Human–Computer Interface: Shoe-Mouse	61
5.3.2 Intelligent Shoes for Pressure Measurement	66
5.3.3 Intelligent Shoes for Human Identification	75
5.4 Conclusion	84
6. Fingertip Human–Computer Interface	88
6.1 Introduction	88
6.2 Hardware Design	90
6.2.1 MEMS Accelerator for Motion Detection	91
6.2.2 Signal Processing and Analysis	95
6.2.3 Radio-Frequency (RF) Wireless System	98
6.2.4 System Evaluation	99
6.3 Specific Applications	103
6.3.1 Human–Robotic–Hand Interaction Using MIDS	103
6.3.2 Computer Mouse on a Fingertip (MIDS-VM)	109
6.3.3 Computer Game Interaction Using MIDS	121
6.3.4 MIDS for PDA Interaction (Embedded-MIDS: E-IDS)	126
6.4 Conclusion	136

7. Ubiquitous 3D Digital Writing Instrument	139
7.1 Introduction	139
7.2 Hardware Design	141
7.3 Signal Processing and Analysis	142
7.3.1 Kalman Filtering for MEMS Sensors	145
7.3.2 Time Update Model	147
7.3.3 Error Model for Time Update	147
7.4 Measurement Update Model	148
7.5 Testing	150
7.5.1 Simulation Test	150
7.5.2 Experiment Test	151
7.6 Writing Application Based on Attitude EKF Compensation	152
7.7 Experimental Results of an Integrated System	157
7.8 Conclusion	166
8. Intelligent Mobile Human Airbag System	169
8.1 Introduction	169
8.2 Hardware Design	171
8.2.1 μ IMU System Design	172
8.2.2 Mechanical Release Mechanism	172
8.2.3 Minimization of Airbag Inflation Time	174
8.2.4 The Punch Test for the Second Mechanism	175
8.2.5 System Integration	178
8.3 Support Vector Machine for Human Motion Determination	181
8.3.1 Principal Component Analysis for Feature Generation	181
8.3.2 Support Vector Machine Classifier	183
8.4 Experimental Results	185
8.4.1 Motion Detection Experiments and Database Forming	185
8.4.2 SVM Training and Falling-Down Recognition	188
8.5 Conclusion	189
Index	191

LIST OF FIGURES

- 2.1. Types of interactions supported by the system.
- 2.2. Prototype of wearable robot.
- 2.3. Hardware architecture of the wearable robot prototype.
- 2.4. Service registration.
- 2.5. All clients and services must contact the lookup service upon joining the federation.
- 2.6. Components in the service-based architecture.
- 2.7. Incorporation of the task coordinator service to the original Jini model.
- 2.8. Pushing the service proxy automatically to the client based on the processing result of the matching service.
- 2.9. Automatic delivery of service based on the processing results of the matching service.
- 2.10. Relationship between the matching service and other components in the federation.
- 2.11. Relationship between the time to register a new service and the number of registered services.
- 2.12. Relationship between the time to search for the lookup service or a normal service and the number of registered services.
- 2.13. Setup of the two rooms in the application.
- 2.14. Flowchart of the application.
- 3.1. The three main components.
- 3.2. Detailed system architecture.
- 3.3. Characters are composed in line segments.
- 3.4. Gray-level difference curve of one row in an image.
- 3.5. A sketch map of the noise filtering method.
- 3.6. Filtering the long line.
- 3.7. Confining the texts.
- 3.8. A sketch map of gray level for a detected character confining the text.
- 3.9. A subimage example after binarization.
- 3.10. An output interface shown in the headset display.
- 4.1. Interface on a cap.
- 4.2. Traditional sensor placement method.
- 4.3. New sensor placement method.
- 4.4. Muscles on the head.
- 4.5. User with the cap interface on a wheelchair.
- 4.6. Activation of the JAW signal.

- 4.7. Activation of the LEFT signal.
- 4.8. Activation of the RIGHT signal.
- 4.9. The floor plan of the experimental environment.
- 4.10. Experimental data for path A–B.
- 4.11. Experimental data for path B–C.
- 4.12. Experimental data for path C–D.
- 5.1. Outline of the hardware design and sensor.
- 5.2. The prototype of the Intelligent Shoe.
- 5.3. Wireless communication process flow.
- 5.4. Different gait events by animation.
- 5.5. Visualization of data.
- 5.6. Result of exponential smoothing.
- 5.7. Output of x-axis acceleration when the shoe is following a rectangular route on a plane.
- 5.8. Motion of foot and its corresponding acc output.
- 5.9. A picture captured from video demonstration.
- 5.10. Result of click test.
- 5.11. Performance of drawing a circle using the Shoe-Mouse.
- 5.12. Photograph of the insole.
- 5.13. One FSR-402 calibration curve.
- 5.14. Pressure waveforms under eight regions of right foot during normal walking (BT = hallux, M1–M5 = 1–5 metatarsal head, PH = posterior heel, and IH = inside heel).
- 5.15. Graphical representation for SVR.
- 5.16. Comparisons of C-SVM predicted results using different parameters: (a) and (b) present the mean pressure and error when $C = 1$, $MSE = 1.18566$; (c) and (d) present the mean pressure and error when $C = 10$, $MSE = 1.0854$; (e) and (f) present the mean pressure and error when $C = 30$, $MSE = 0.865572$.
- 5.17. Comparisons of ν -SVM predicted results using different parameters: (a) and (b) present the mean pressure and error when $\nu = 0.1$, $MSE = 2.03745$; (c) and (d) present the mean pressure and error when $\nu = 0.5$, $MSE = 0.929982$; (e) and (f) present the mean pressure and error when $\nu = 0.8$, $MSE = 0.874932$.
- 5.18. IMU waveforms during normal walking.
- 5.19. Likelihood versus Learning Iteration Index in the training process.
- 5.20. The likelihood of simulated sequences from HMMs to the corresponding HMMs.
- 5.21. The similarity distance measure of simulated sequences from HMMs to the corresponding HMMs.
- 5.22. The likelihood of gait sequence from individual wearer to the corresponding HMMs.
- 5.23. The similarity distance measure of gait sequences from individual wearer to the corresponding HMMs.
- 5.42. The identification success rate with gait modeling.
- 5.25. The identification success rate with 9-state HMM gait modeling.

- 6.1. Wearable wireless MIDS prototype (this version includes five rings and one wrist watch).
- 6.2. The MIDS schematic diagram including four main system units: 1) sensing unit, 2) signal processing unit, 3) interface unit, and 4) driver interface program.
- 6.3. Three types of accelerometer: single axis, dual-axis, and three-axis.
- 6.4. Illustration of sensor operation.
- 6.5. Model of a MEMS capacitive accelerometer.
- 6.6. Circuit analysis for capacitive accelerometer modeling.
- 6.7. Using x - and y -direction output to measure 360° of tilt.
- 6.8. Illustration of the data acquisition of the MCU.
- 6.9. Program flow of signal processing unit.
- 6.10. Schematic of MIDS ring.
- 6.11. Prototype of simple MIDS rings.
- 6.12. Experimental setup for motion tests.
- 6.13. Data acquisition schematic of the simple MIDS.
- 6.14. MIDS click motion test in mid-air.
- 6.15. MIDS circular motion test on a desk (time sequence acceleration).
- 6.16. MIDS circular motion test on a desk.
- 6.17. Acceleration PSD data measured by MIDS rings worn on a test subject's finger as the subject typed as fast as he can for 100 times using each finger.
- 6.18. Coordinate definition of the robotic hand system.
- 6.19. Configuration for robotic hand and MIDS.
- 6.20. First experiment—Angle data of five fingers from MIDS and joint angle sensors inside robotic hand system.
- 6.21. Process of grasping motion control of robotic hand system by MIDS.
- 6.22. Process of controlling a robotic hand system to grasp a ball by MIDS.
- 6.23. Second experiment—Angle data from six MIDS sensors (five fingers and arm) and the joint angles sensors on the robotic fingers.
- 6.24. Configuration comparison between traditional input devices and a wireless MIDS.
- 6.25. Schematic diagram of the MIDS-VM wired ring (two buttons).
- 6.26. Serial MIDS-VM wired ring (two buttons).
- 6.27. USB MIDS-VM wired ring (two buttons).
- 6.28. Schematic diagram of the MIDS-VM wireless ring (two buttons).
- 6.29. MIDS-VM wireless ring (side-button design).
- 6.30. MIDS-VM wireless ring (top-button design).
- 6.31. Prototype of serial receiver.
- 6.32. Prototype of USB receiver.
- 6.33. Force diagram of the side-button ring of MIDS-VM.
- 6.34. Force diagram of the top-button ring of MIDS-VM.
- 6.35. Force diagram for button pressing (side-button ring).
- 6.36. Force diagram for button pressing (top-button ring).
- 6.37. Mouse cursor movement operated by the MIDS-VM.

- 6.38. Command for the mouse movement by MIDS-VM.
- 6.39. Working principle for MIDS-VM—Rotation of user's finger or wrist.
- 6.40. Output sequence of the MIDS-VM.
- 6.41. Working principle of the MIDS-VM.
- 6.42. Demonstration for MIDS-VM.
- 6.43. MIDS motion-based controllers for different gaming applications.
- 6.44. Function description of a four-button wired MIDS game controller ring.
- 6.45. MIDS multifunction interface for two-and four-button ring.
- 6.46. MIDS interface for motion settings.
- 6.47. MIDS interface for button function selection.
- 6.48. To rotate the MIDS mouse ring in an anticlockwise direction.
- 6.49. The conceptual system configuration of E-MIDS for mobile devices.
- 6.50. Schematic and prototype of E-MIDS.
- 6.51. Installation of E-MIDS for a Sharp PDA.
- 6.52. Data flowchart of E-MIDS.
- 6.53. Program flow of Zaurus games.
- 6.54. Program flow of "Aliens" with E-MIDS motion-to-command algorithm.
- 6.55. Coordinate frame of the E-MIDS.
- 6.56. Demonstration of "Aliens" with E-MIDS.
- 6.57. Rotating the PDA counterclockwise.
- 6.58. Program flow to capture command time.
- 6.59. PSD of input rates by using E-MIDS, keypad, and stylus.
- 7.1. Wireless MAG- μ MU block diagram.
- 7.2. The prototype of the MAG- μ MU with a Bluetooth module.
- 7.3. Acceleration variance underestimates motion intensity (velocity) caused by sampling error.
- 7.4. Kalman smoother-based stroke segment for motion status detection (1).
See color insert.
- 7.5. Kalman smoother-based stroke segment for motion status detection (2).
See color insert.
- 7.6. Block diagram of extended Kalman filter algorithm.
- 7.7. Synthetic sensor measurement. See color insert.
- 7.8. Simulation attitude comparison: filter result and gyroscope propagation.
See color insert.
- 7.9. Real sensor data from MAG- μ IMU. See color insert.
- 7.10. Experiment attitude comparison: filter result and gyroscope propagation.
See color insert.
- 7.11. Complementary attitude EKF diagram.
- 7.12. The MAG- μ IMU system structure for a wireless digital writing instrument.
- 7.13. Experiment setup for Digital Writing Instrument with MAG- μ IMU.
- 7.14. Digital Writing Instrument sensor outputs. See color insert.
- 7.15. Nine-channel motion information WRT the sensor frame. See color insert.
- 7.16. Stroke Segment Kalman Filter as sync switch for measurement update.
See color insert.

- 7.17. Tracking result of Complementary Attitude EKF. See color insert.
- 7.18. Accelerations WRT-Earth's frame by complementary attitude EKF. See color insert.
- 7.19. Performance comparison for the acceleration coordinate transform in x-axis. See color insert.
- 7.20. Performance comparison for the acceleration coordinate transform in y-axis. See color insert.
- 7.21. Performance comparison for the acceleration coordinate transform in z-axis. See color insert.
- 7.22. Capital letter "A" written by complementary attitude EKF.
- 7.23. Stroke segment according to the Earth frame acceleration. See color insert.
- 7.24. X-axis acceleration updated by zero velocity compensation. See color insert.
- 7.25. Y-axis acceleration updated by zero velocity compensation. See color insert.
- 7.26. Z-axis acceleration updated by zero velocity compensation. See color insert.
- 7.27. Writing result for "A" by complementary attitude EKF and ZVC.
- 7.28. Handwriting result for "A" using DWI system during the position tracking experiment.
- 7.29. Writing result for "A" by gyro attitude propagation and ZVC.
- 8.1. Conceptual illustration of the "intelligent" human airbag system in action.
- 8.2. Photograph of a 3D motion sensing system consisting of three gyros and three acceleration sensors.
- 8.3. The cross-sectional view of the second mechanism of the inflator.
- 8.4. The cross-sectional view of the second mechanism of the inflator.
- 8.5. Results of continuous inlet pressure VS inflation time.
- 8.6. The setup of the second mechanism.
- 8.7. Discharge time of 12-g pressurized cylinder against spring force.
- 8.8. Estimation of the inflation time of the 531-mL airbag by the solenoid valve.
- 8.9. Estimation of the inflation time of the 1200-mL airbag by a 16-g pressurized cylinder.
- 8.10. Schematic chart of the μ IMU system.
- 8.11. Pure falling-down state cutting.
- 8.12. Original motion data recording of falling-down. See color insert.
- 8.13. A demonstration of real-time recognition of falling-down motion with inflation of airbag. See color insert.
- 8.14. Schematic chart of SVM training.
- 8.15. The different distinguishing ability of different eigenvectors.
- 8.16. Lateral falling-down state. See color insert.
- 8.17. Analysis for a lateral falling-down. See color insert.
- 8.18. DFT transform result VS frequency of failing.
- 8.19. Original motion data recording of forward running. See color insert.
- 8.20. One period running state cutting.
- 8.21. DFT transform result VS frequency of running.

LIST OF TABLES

- 2.1. Steps for service registration
- 2.2. Steps involving the task coordinator service
- 2.3. Steps for automatic service proxy push
- 2.4. Steps for automatic service delivery
- 2.5. Rule base for determining the service supply index
- 2.6. Rule base for determining the service demand index
- 2.7. Rule base for determining the system index
- 2.8. Rule base for matching service
- 2.9. Services developed for the application scenario
- 4.1. Comparison of using different approaches
- 4.2. The input pattern of our design
- 4.3. Control mapping
- 5.1. Regression results of C -SVM with $C = 1, 10$, and 30
- 5.2. Regression results of ν -SVM with $\nu = 0.1, 0.5$, and 0.8
- 6.2. Detailed formulas for calculating the tilt angle α in a 360° plane
- 6.2. Parameters of MIDS-VM motion-to-command algorithm
- 6.3. Meanings for start byte values
- 6.4. Technical data of wireless MIDS mouse ring
- 6.5. Technical data of wireless MIDS receiver interface
- 6.6. Technical data of wired MIDS mouse ring
- 6.7. Technical data of wireless game controller ring
- 6.8. Comparison between E-MIDS and existing input devices for PDAs
- 6.9. Illustration of motion-to-command algorithm
- 6.10. Total number of input cycles in 1 minute
- 6.11. Technical data of the E-MIDS
- 8.1. The results of a square cross-nail to punch pressurized cylinders
- 8.2. The coefficient of the SVM classifier