

Contents

- 1 Signal Quality Assessment in Physiological Monitoring: Requirements, Practices and Future Directions 1**
 - 1.1 The Case for Signal Quality Assessment 2
 - 1.1.1 Continuous Physiological Monitoring 2
 - 1.1.2 Obstacles to Clinical Adoption 4
 - 1.1.3 Signal Quality Assessment 5
 - 1.2 Design Considerations and Requirements 5
 - 1.3 Basic Design Framework 7
 - 1.3.1 Population Demographics and Data Specifications 8
 - 1.3.2 Establishment of Ground Truth 9
 - 1.3.3 Performance Evaluation 9
 - 1.4 Challenges and Future Directions 10
 - 1.5 Summary 12
 - References 12
- 2 Quality Assessment for the Electrocardiogram (ECG) 15**
 - 2.1 The Electrocardiogram (ECG) 16
 - 2.1.1 ECG Morphology 16
 - 2.1.2 Spectral Characteristics of the ECG 19
 - 2.2 ECG Quality Considerations 19
 - 2.3 Single-Channel Approaches 20
 - 2.3.1 ECG Feature Extraction 20
 - 2.3.2 Decision Rules 31
 - 2.4 Multi-lead Approaches 34
 - 2.4.1 Features Specific to Multi-lead ECGs 35
 - 2.5 Summary 38
 - References 39
- 3 Quality Assessment for the Photoplethysmogram (PPG) 41**
 - 3.1 The Photoplethysmogram (PPG) 42

3.1.1	PPG Morphology	42
3.1.2	Spectral Characteristics of the PPG	44
3.2	PPG and Noise	45
3.3	PPG Quality Considerations	46
3.4	PPG Feature Extraction	47
3.4.1	PPG Beat Detection	47
3.4.2	Time-Domain Features	48
3.4.3	Frequency-Domain Features	56
3.5	Decision Rules	58
3.5.1	Physiological Thresholds and Heuristics	58
3.5.2	Data Fusion	59
3.6	Summary	61
	References	61

Signal Quality Assessment in Physiological Monitoring

State of the Art and Practical Considerations

Orphanidou, C.

2018, VI, 63 p. 23 illus. in color., Softcover

ISBN: 978-3-319-68414-7