**Appendix A**

**Table 1**

Details of the Parameterization of The Multiscale Hybrid Evolutionary Model at Various Scales

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Layer name** | **Output Size** | **MSHEA-N** | **MSHEA-M** | **MSHEA-T** | **MSHEA-S** |
| **Stem** | [256,250,64] |  |  |  |  |
| **Stage 1** | [256, 250, 64] |  |  |  |  |
|  |  |  |  |
| **Stage 2** | [256, 125, 128] | conv1d 3, 128-d, LN | conv1d 3, 128-d, LN | conv1d 3, 128-d, LN | conv1d 3, 128-d, LN |
|  |  |  |  |
| **Stage 3** | [256, 63, 256] | conv1d 3, 256-d, LN | conv1d 3, 256-d, LN | conv1d 3, 256-d, LN | conv1d 3, 256-d, LN |
|  |  |  |  |
| **Stage 4** | [256, 32, 512] | conv1d 3, 512-d, LN | conv1d 3, 512-d, LN | conv1d 3, 512-d, LN | conv1d 3, 512-d, LN |
|  |  |  |  |
| AdaptiveAvgPool1d, Flatten, 1-d, Sigmoid | | | | | | |

*The model is composed of a Stem layer and Stage 1 through Stage 4. The Stem layer includes a 1D convolution with a stride of 3, a convolution layer with an output dimension of 64 (64-d), and a Batch Normalization (BN) layer. Stages 1-4 each consist of two MSFA blocks, one MSFA\_MSA block, and one MSA block. "dim 64" denotes an embedding dimension of 64, and "sam.ep.r 2" indicates an expansion rate of 2 for the FA module.*



**Fig. 1.** Fine-grained scores from different quality segments. (a) ECG; (b) PPG.