Appendix A. IoT System and Deep Learning Specifications

Table A.7: Detailed specifications of IoT sensors used in the MCPS.

Component	Model	Specifications	Accuracy
Microcontroller	Raspberry Pi 4 Model B	4GB RAM, 64-bit quad-core	N/A
Temperature Sensor	DS18B20	Digital, -55C to +125C	0.5C
Blood Pressure Monitor	OMRON HEM-7120	0299 mmHg	3 mmHg
Pulse Oximeter	MAX30102	HR: 25250 bpm	2 bpm
Glucometer	ACCU-CHEK Active	10600 mg/dL	15%

Table A.7 provides detailed technical specifications of the IoT hardware components used in the medical cyber-physical system.

Appendix B. RNN Architecture Specifications

Table B.8 details the architectural specifications used for the RNN models with attention mechanisms.

Table B.8: RNN architecture specifications for temporal sequence modeling.

Parameter	LSTM + Attention	Configuration
Input Shape	(8, 1)	8 timesteps, 1 feature
LSTM Units	50	Hidden state dimension
Dropout Rate	0.2	Regularization
Learning Rate	0.001	Adam optimizer
Batch Size	32	Training batch size
Epochs	50	Maximum training epochs
Early Stopping	10	Patience parameter
Attention Type	Additive	Bahdanau attention
Output Layer	Dense(3)	Softmax activation

Appendix C. Data Collection Protocol

The standardized protocol for data collection included:

- Patient registration and consent
- Sensor calibration (daily)
- Measurement timing (every 30 minutes during 8-hour sessions)
- Data quality checks (automated range validation)
- Clinical validation (weekly review by medical staff)
- Data synchronization (automatic cloud upload every 5 minutes)