Chapter 1

Chapter 0: Abstract

Abstract

This thesis presents a comprehensive multi-sensor recording system designed for contactless Galvanic Skin Response (GSR) prediction research. The system integrates multiple sensing modalities including thermal imaging, RGB cameras, and environmental sensors to enable non-intrusive stress monitoring. The work addresses fundamental challenges in physiological computing by developing a robust, offline-first recording platform that supports distributed sensor networks and real-time data synchronization.

Key contributions include: (1) a distributed recording architecture supporting multiple sensor types, (2) contactless GSR prediction algorithms utilizing computer vision and thermal analysis, (3) comprehensive validation studies comparing contactless predictions with traditional contact-based measurements, and (4) open-source implementation enabling reproducible research in physiological computing.

The system demonstrates significant potential for applications in human-computer interaction, health monitoring, and stress assessment while maintaining user comfort and ecological validity through completely non-intrusive measurement approaches.