

**UNIVERSITY OF MACAU**

**ABSTRACT**

**ECG PARAMETER EXTRACTOR OF INTELLIGENT  
HOME HEALTHCARE EMBEDDED SYSTEM**

by Chan Weng Chi

Thesis Supervisor:

Assistant Professor, Vai Mang I

Thesis Co-Supervisor:

Assistant Professor, Mak Peng Un

Master of Science in Electrical and Electronics Engineering

The past few years have witnessed a rapid growth in the development of telemedicine systems and monitoring devices for patients with chronic diseases and requiring continuous telemonitoring treatment. However, most of these existing systems can only provide telemonitoring services or basic information about the health condition of the patients. For this reason, a research project – the Intelligent Home Healthcare Embedded System (IHHCS), which is aimed to provide patients with diagnosis about their health status at home, is proposed. This system mainly consists of three parts: an algorithm for processing the extracted parameters, an embedded medical transducer parameter extractor, and an ARM-cored structure embedded with  $\mu$ Clinux system. The parameter extraction algorithm, which utilizes the state-of-the-art wavelet signal processing technique, is built to interlink the algorithm and the ARM-cored system for elevating the overall performance of IHHCS. Different types of pluggable medical transducers (e.g. electrocardiograph, sphygmomanometer, and blood glucose meter) for patients with corresponding illnesses can be flexibly connected to the interface of the embedded ARM-cored system. Among all, Electrocardiogram (ECG) is one of the most significant and commonly used biomedical signals in analyzing the health status of human beings. Although several parameter extraction algorithms are proposed in recent years, only some of them can comprehensively extract many significant features of ECG. As a result, this thesis tries to propose a new algorithm which concentrates in the algorithm of ECG parameter extraction.