



جامعة الإمارات العربية المتحدة  
United Arab Emirates University

**The College of Graduate Studies and the College of Engineering Cordially  
Invite You to a  
Master Thesis Defense**

Entitled

*PIEZOELECTRIC-BASED CARDIAC MONITORING PORTABLE SYSTEM*

by

Shina Mokhtari

Faculty Advisor

Dr. Mahmoud Al Ahmad, Department of Electrical Engineering  
College of Engineering

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Abstract

In this thesis, a portable-based cardiac monitoring system is discussed, which helps to keep a check on patient vitals. This work describes the design and development of a Bluetooth system, incorporating a piezoelectric sensor-sheet, which contributes to a wireless cardiac-monitoring device and avoid the need for collecting the signals with wires. When the Bluetooth-connected piezoelectric sensor is attached to the human chest, the cardiac mechanical activity will induce a local strain in the active piezoelectric materials. This strain is converted to an electrical output voltage which is then collected and transmitted through the Bluetooth system. Piezoelectric theory and signal processing methods are used to extract the cardiac parameters from the collected voltage signals. These parameters have been validated using the conventional cardiac cycle based meters. This wireless cardiac monitoring system can find a wide range of applications due to its compactness, light weight, and reliability.

**Keywords:** Cardiac monitoring, Bluetooth system, piezoelectric, portable system, signal processing