Department of Electrical and Computer Engineering

North South University

Senior Design Project

Analysis Of PPG Signal Of Cardiac Disease

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Letter of Transmittal

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To

Dr. Shazzad Hossain

Associate Professor and Chairman

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh

Subject: Submission of Senior Design Project on "Analysis pf PPG Signal of Cardiac Disease"

Dear Sir,

With proper veneration and modest submission, we would like to draw your kind attention and stated that we would like to submit our Senior Design project on **"Analysis Of PPG Signal Of Cardiac Disease"** as a part of our Bachelor of Science in Computer Science and Engineering program. This report covers all the theories, knowledge, experimental findings related to our project. We gave our best to produce this report regarding to our final project.

We, therefore, hope you will be kind to accept our Senior Design Project and state your honest informational judgments.

Yours sincerely,

Ayesha Siddiqua	Nowshin Mostafa	Sayeda Meem Rameen
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Declaration

We certify that, all sentences, passages and figures / diagrams quoted in this thesis from other people's work have been specifically acknowledged by clear cross-referencing to the author(s), work and page(s).

Furthermore, we have read and understood the definition of Unfair Means for assessed work produced in the B.Sc. Student Handbook and have complied with its requirements. We understand that failure to comply with the above amounts to plagiarism and will be considered grounds for failure in this thesis and the degree examination as a whole.

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Countersigned by,

Dr. Tanzilur Rahman (Supervisor)
Assistant Professor and Program Coordinator
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Dr. Shazzad Hossain
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Abstract

In this thesis paper we are presenting the result of analysis of Photoplethysmogram (PPG) signal of normal subjects and cardiovascular problematic subjects. Photoplethysmogram (PPG) is a non-invasive and inexpensive method for detection of cardiovascular disease. Photoplethysmogram is a technique that measures blood volume changes from skin which is close to arteries. PPG data were taken from 10 subjects and data were taken from subject's index finger. Amongst 10 subjects 5 subjects were cardiovascular problematic patients and 5 were normal. Primary cardiac problem detection technique is Electrocardiogram (ECG). ECG is also a noninvasive technique but ECG is expensive compare to PPG. ECG machines are big, not portable and very expensive to have individually at home. ECG is more suitable for hospitals. ECG tests are also expensive. It will cost very large for anyone who wants to keep going on tests of cardiac disease detection at early stage. Compared to ECG PPG is very small, portable and inexpensive. All kind of people can afford PPG based system for cardiac detection at home. In this paper we presented two methods based on PPG signal to analyze cardiac disease one is pulse amped sensor and other one is smartphone. This paper presents all the research, techniques, and algorithm development to analyze cardiac disease using pulse amped sensor and smartphone both individually. Pulse sensor is affordable and 2.1 billion or more people already uses smartphone today's time so any system based on both or any of the way will be low cost and great for early detection of cardiac disease at home or anywhere. Pulse sensor and smartphone both can be a worth alternative of ECG. We hope this study will be valuable to create both or any of the monitoring system for cardiovascular disease detection.