

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“Jnana Sangama” Belagavi – 590 010



PROJECT REPORT ON “DEVELOPMENT OF PROTOTYPE HEART PULSE RATE MONITORING SYSTEM”

Submitted in partial fulfillment of the requirements for the award of degree

**BACHELOR OF ENGINEERING
IN
ELECTRONICS & COMMUNICATION ENGINEERING**

Submitted By

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**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY
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2020-2021

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

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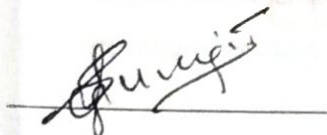
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the project work entitled "DEVELOPMENT OF PROTOTYPE HEART PULSE RATE MONITORING SYSTEM" is a bona fide work carried out by

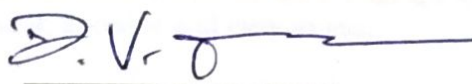
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in partial fulfillment for the award of **BACHELOR OF ENGINEERING** in **ELECTRONICS & COMMUNICATION ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2020–2021. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.



Signature of the Guide

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Signature of the Principal

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ABSTRACT

Heart rate measurement is a basic and essential for daily health monitoring. A heart rate monitoring system is a personal monitoring device that allows one to measure heart rate in real-time. If someone wants to record the data or use it to trigger events, there is a need to turn that mechanical pulsing action into an electrical signal and this can be done only through heart rate measuring system. The pulse rate helps to find out if the heart is pumping enough blood to the body and also helps to find the cause of various symptoms such as an irregular or rapid heartbeat, dizziness, fainting, chest pain or difficulty in breathing. More than million people are at high risk of having heart related diseases. It would be helpful if there was a way for these people to check the heart rate by sitting at home.

The project proposes a design model of MEMS based piezoresistive pressure sensor realizing a portable, comfortable and low cost solution for long-term domestic heart rate monitoring. MEMS based piezoresistive pressure sensor will be the most efficient sensor in measuring the heart rate as they possess high linearity and stability. MEMS sensors have the advantage of very small size, this means they can respond rapidly to small changes in pressure. Piezoresistive pressure sensors were some of the first MEMS devices to be commercialized. Applied pressure range is varied from 100 to 1000 kPa. To gain the optimum output, different combination of material for diaphragm and piezoresistor have been studied and corresponding displacement change, shear stress distribution and output voltage have been shown. The developed project is of low cost, portable and easy to use.