Omer Mostafa / Prof. P. C. Pandey (Supervisor), “An arm simulator for blood pressure measurement,” *M.Tech. dissertation*, Department of Electrical Engineering, Indian Institute of Technology Bombay, July 2018.

ABSTRACT

Arm simulator for blood pressure (BP) measurement is an instrument that mimics the behavior of the human arm during the noninvasive BP measurement. It can be useful for training of the healthcare workers by getting them exposed to a wide range of normal and abnormal cardiovascular conditions and can also be used for calibration and evaluation of automatic BP monitors. The objective of the project is to develop a compact arm simulator for both auscultatory and oscillometric methods of BP measurement. It is in the form of a cylinder for wrapping the cuff of the BP monitor around it. The pressure of the cuff is measured using a pressure sensor connected to the tube between the cuff and the BP monitor. It is designed as a microcontroller-based instrument with a facility for wirelessly setting the simulation parameters including the systolic pressure, diastolic pressure, heart rate, arrhythmia level, and the pulse volume, using a graphical user interface (GUI) on a PC or a handheld computing device with Bluetooth interface. The simulation of the arm for the blood pressure measurement is carried out by generating the Korotkoff sounds for auscultatory method and pulsatile vibrations for the oscillometric method at each heartbeat with the amplitude and timing in accordance with the measured value of the cuff pressure and the set simulation parameters.