ABSTRACT

There are 1.5 billion people in this world who has some form of hearing impairment, and 8 out of 100.000 are born mute. Those people had to rely on sign language to communicate. The recorded history of sign language in Western societies begins in the 17th century as a visual language or means of communication, but evidence for forms of communication, including hand gestures, dates back to Greece in the 5th century BC. Like every other language in the world, the language must be spoken by both parties for communication to flow smoothly. With this in mind, it is obvious that for more than 2000 years, there is no way to understand sign language without being fluent in it first. Unlike sign language, most languages today are easily translated by an app downloaded on a smartphone. Due to this reason, a device that can translate sign language, one of which is also portable, is needed in current society. Thus, a motion-detecting device that could also detect finger retraction is a suitable solution. The inputs of an MPU6050 (gyro sensor) and a potentiometer (retraction measurement sensor) were recorded and read by Arduino Uno (microcontroller) and compiled in a testbed. From the testbed, the position of each finger is pinpointed by setting ranges for the input from the potentiometer. After that, the inputs from the potentiometer are combined with the input of the MPU6050 to detect hand movement. Then, conditions are dictated for both sensors to translate the data collected into hand and finger positions. Altogether, whether the subject's fingers are bent or straight, and if their hands are upright, tilted, or laying flat can be figured out by following those conditions. Finally, translated words can be generated by matching the conditions that are fulfilled by the collected data. Through this method, unless there is an external physical factor, the translations of the device are accurate.

Keywords: Hearing impairment, mute, communication, MPU6050, Potentiometer, Arduino Uno, conditions, Translation.