

# SMART JOGGING BUDDY

## Introduction

Our idea is to develop a jogging assistant system supporting both normal users and visual impaired users. Smart Jogging Buddy (SJB) system can be used in either *two modes*: **NORMAL** or **BLIND**. For **BLIND** mode, SJB can guide the blind to **avoid obstacles** as well as pot-holes, manholes, or even step stairs so that they can **walk alone on their own**; and assists them in **jogging independently** along dedicated colored tracks. For **NORMAL** mode, SJB provides **full monitoring and guidance capabilities** as in a commercial treadmill.

Main system comprises of two boards, Master and Slave, which collect and process data independently but they are able to communicate with each other via **I<sup>2</sup>C protocol** in order to make accurate decisions.

### Subsystems:

- Voice warning module consists of eight four-second alert messages. The 3-to-8 decoder is used to reduce I/O pins controlled by PIC Master.
- Simple ultrasonic detector attached in front of a shoe detects low objects in the range from 5cm to 30 cm.
- Color tracker with vibrator assists the blind in jogging along dedicated tracks.
- Heartbeat monitor generates impulses corresponding to heart rate.
- Ultrasonic distance detector attached to hand-wrist/finger of the blind helps to detect distance from obstacle, manhole, and stair step.
- Step counter is a fast pulse generating circuit which would generate a pulse whenever user makes a step.
- Fall detector can detect whenever user fall on face and trigger the helping voice.
- Log handler helps user to check/clear their personal data of doing exercises stored in SJB.

## System features

- Typical features: supporting the blind and normal users with heart rate monitoring, sound message alert, speed/accumulated distance measuring, small obstacle detection, multi-level of running/jogging, distance away from objects detection.
- Special features: stair step/pot-holes/manholes detection, fall detection, supporting jogging mode for the blind.
- Extra features: check/save/clear log, reset/change alert messages, resuming data mechanism.

