

Smart White Cane

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Blindness or visual impairment affects many people around the world. There are nearly 14 % visual disables in Sri Lanka. Blind people use white canes to identify obstacles by moving the cane. Over the years, blind people have had different reasons for using canes. The modern white cane, as we know it, did not come in to existence until World War I. There is much debate surrounding which country developed the white cane first. Along with the development of useful canes and proper techniques came laws to allow blind people equal access to public streets and buildings. The research focused to improve the facilities in existing white cane with minimal changes of the original white cane. Ultrasonic sensors measure the distance of target objects or materials through the air using ‘non-contact’ pulse echo technology. In the pulse echo method, a burst of pulses is sent through the transmission medium and is reflected by an object kept at a specified distance. The time taken for the pulse to propagate from the transmitter to receiver is proportional to the distance of object. The amplitude of the received signal gets significantly attenuated and is a function of nature of the medium and the distance between the transmitter and target. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the sonar sensor and the object. A development board placed in the cane is powered by a 9V battery with three ultrasonic sensors for the front, right and left sides. The front sensor sensitivity is adjusted as 30 cm so that when the obstacle is within less than 30 cm distance, a unique vibration is given to the user’s handle through the cloth covering the cloth. Left and right side sensitivities are adjusted to 25 cm. Therefore, when the obstacle is in the tracking range, the Cane provides different, unique vibrations to the user. Different vibration frequencies are used in this device to identify the direction of the obstacle. If the obstacles are in the front side, the vibration frequency is high while other two sides give different vibration than the front side. User required to short time training before using the cane. We have to give instructions to the user before they start to use the smart white cane as they do not know how to identify vibration differences and guide them to keep it with correct angle.

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