

Performance of Pedestrian interactive clothing system for night-time safety

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Abstract:

Addressing pedestrian safety at night is important to help limit the accidents recorded, especially at night-time. Pedestrian accidents are higher at night-time as compared to daytime. These accidents are largely due to the clothes worn and the conditions of darkness which places difficulty for pedestrian visibility and drivers' vision at night-time. This situation has exposed pedestrians to a lot of dangers on the road, thus the need to innovate pedestrian clothing to improve their visibility and visual detection by drivers. Herein, smart interactive clothing is developed to respond to light stimuli to produce safety features. Interactive clothing as part of electronic textiles is smart clothing embedded with electronic components in textile structures for advanced functions and controls [1, 2]. These clothing interact and respond to external stimuli in the environment to produce the respected outputs. This follows successful results reported on the development of a low-cost e-yarn for pedestrian safety clothing [3] and retro-reflective textiles with African design patterns [4]. In this ongoing research study, the aforementioned materials are combined with a new patent approach is proposed to ensure improved visibility and additional safety alert features. Preliminary results demonstrate the ability to integrate LEDs on conductive yarns which are combined with micro-controllers and sensors to produce safety alert features of vibration, lighting, and sound. Results from the laboratory test of light detection by the sensors of the interactive clothing showed a detection range of 25 meters when exposed to the headlights of a simulated car. It was shown that the developed output proved a preliminary success for further research geared towards enhancing night-time safety for pedestrians. This proposed system will significantly help pedestrians most especially the elderly and disabled (deaf and blind) road users to be cautious on the road.

Keywords: pedestrians, safety and visibility, interactive clothing, night-time.



Figure 1 The interactive clothing

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