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# Evaluation of Energy Harvesting for Smart Cane Application

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Abstract

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## Abstract

Walking cane is a device used by disabled people to navigate themselves. In recent days, it is equipped with various sensors and functions and it is known as a smart cane . It is already available in the market. However, the smart cane is depending on the battery supply that has to be charged every now and then. In relation to that, this paper is focusing on evaluating energy harvesting for powering up a smart cane . This project evaluates possible energy harvesting considering the nature of usage which are outside, gripping motion, tapping motion of the cane itself. Here, an energy harvesting system was designed and attached to a walking stick and the energy generated was observed. The system consists of a combination of solar modules and piezoelectric modules. The solar modules were attached to the handle, whilst the piezoelectric modules were attached to the bottom of the cane . From there, an experimental evaluation was done by testing the cane in indoor and outdoor environment by subjects with different body profile. The result shows that higher power is generated during outdoor usage, and this shows that the solar modules contribute the most to the generated energy . On the other hand, the piezoelectric modules only contribute a small portion of the generated energy . However, this contribution is significantly important during the usage of the cane in indoor environment, where less sunlight is available. © 2021 IEEE.

## Author keywords

energy harvesting ; piezoelectric; smart cane ; solar

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