

Wall plug-in power supply system for a robotic vacuum cleaner

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Abstract

Robotic vacuum-cleaners are widely used in households, in entertainment, and in the security sector. To successfully extend its wiping area and postpone working time, an intelligent power charging system plays an essential role.

In this paper, an intelligent wall plug-in power system is developed. By using image processing technology, an image of the electric socket on the wall is captured by a CMOS camera and processed directly to a self-propelled unit of the system so it may approach the wall-socket. Before the plug is plugged into the electric socket by mechanical arms, the body of the system moves toward and parallel with the wall until the system reaches the wall. The main body of the system, which has a Microchip PIC18F452 microcontroller, includes two self-propelled stepping motors, two mechanical arms, six infrared distance-measuring sensors in which the effective detection distance is 10 to 80 cm, one CMOS webcam with 640×480 resolution, and four batteries (4hrs duration). The tracked target of this system is a regular electric wall-socket. The man-machine interface is written by Borland C++ Builder, which is used in communicating and processing the image.

Keywords: *plug-in power system, infrared rays, image process*

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