Design and fabrication of autonomous beach cleaning and garbage sorting robot

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Abstract

At present environmental protection and care, waste collectors' robots are widely used, because they locate, collect and dispose of garbage in a controlled, autonomous, and fast way. This project will implement an autonomous robot capable to navigate in the sand, collecting garbage, and transporting them to a particular deposit. Developing waste collectors' robots is currently a research and investment matter, so this project presents an efficient solution to the problem of the accumulation of garbage on beaches. The major objective of this robot is to minimize coastal wastage by reducing Garbage. Here two methods were used to detect garbage, the first method is the Architecture-Alex net and the second method is Image processing using OpenCV python. In the first method, by taking photos the model was trained and the accuracy and loss were checked in the second method a digital camera was used to capture images of plastics and polythene in the sand an algorithm separates the garbage using size and color filtering techniques by removing the regular part of the captured images. This robot moves on sand using chain wheels and the garbage is collected using a conveyor belt having metal hooks. The novelty of this robot is that it provides a mechanism to identify and sort polythene and plastics separately. The feature of this robot is that it is simple, cheap, and user-friendly.

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