

Optimizing the Scanning Time with Radiation Prediction Using a Machine Learning Technique

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Abstract : Radiation sources have been used in many industries, such as gamma sources in medical imaging. These waves have destructive effects on humans and the environment. It is very important to detect and find the source of these waves because these sources cannot be seen by the eye. A portable robot has been designed and built with the purpose of revealing radiation sources that are able to scan the place from 5 to 20 meters away and shows the location of the sources according to the intensity of the waves on a two-dimensional digital image. The operation of the robot is done by measuring the pixels separately. By increasing the image measurement resolution, we will have a more accurate scan of the environment, and more points will be detected. But this causes a lot of time to be spent on scanning. In this paper, to overcome this challenge, we designed a method that can optimize this time. In this method, a small number of important points of the environment are measured. Hence the remaining pixels are predicted and estimated by regression algorithms in machine learning. The research method is based on comparing the actual values of all pixels. These steps have been repeated with several other radiation sources. The obtained results of the study show that the values estimated by the regression method are very close to the real values.

Keywords : regression, machine learning, scan radiation, robot

Conference Title : ICCNCS 2023 : International Conference on Computer Networks and Computer Science

Conference Location : Montreal, Canada

Conference Dates : August 03-04, 2023