Plastic Waste Classification System using image processing and deep learning

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The plastic waste management is a challenge for the whole world. Manual sorting of garbage is a tedious and expensive process, which is why scientists create and study automated sorting techniques to improve the overall efficiency of the recycling process. The plastic waste might be automatically selected on the sorting lines businesses for waste disposal by using methods of image processing and artificial intelligence, especially deep learning, to improve the overall efficiency of the recycling process. Waste segregation techniques and procedures are applied to major groups of materials such as paper, glass, metal, wood, and plastic. However, the biggest challenge is separating different types of materials in a given group, e.g. sorting different colors of glass or different types of plastics. The problem of plastic garbage is interesting and important at the same time due to the possibility of recycling only certain types of plastics (e.g. PET can be converted into polyester material). Thus, there is a problem with the separation of different types of plastics, some of which can be reused. One of the possibilities is the use of deep learning and convolutional neural network. In household waste, the most are plastic components, and the four dominant types: PET - polyethylene terephthalate, HDPE - high-density polyethylene, PP- polypropylene, PS-polystyrene. The main problem considered in this article is the creation of an automatic plastic waste segregation method, which can separate four mentioned categories: PS, PP, PE-HD and PET, and could be applicable on a sorting plant.

Speaker Biography

Janusz Bobulski has completed his PhD at the age of 29 years from Czestochowa University of Technology, Poland; in 2018 he received habilitation. He is the Associate Professor of Czestochowa University of Technology, Poland. He has over 70 publications that have been cited over 70 times, and his/her publication H-index is 5 and has been serving as an editorial board member of reputed Journals. His scientific interests include: artificial intelligence, image processing and recognition, pattern recognition, deep learning.

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