



Abschlussvortrag Masterarbeit Nyeck Mbialeu Nelly Nicaise

„Development of an Algorithm for EE-Device Recognition“

Waste of resources is an increasingly significant issue of environmental concern due to the large amount of waste electrical and electronic equipment (WEEE) being discarded worldwide.

Given that WEEE contains not only just hazardous contaminants but also valuable raw materials that should be retrieved and recycled. In the EU, a commission has established a classification system for electronic and electrical (EE) equipment in order to improve recycling management. Discarding this equipment is influenced by the category it belongs to and consequently the resources contained within. This thesis aims to analyse the recognition and classification of EE devices in an image.

Based on the literature review in the field of image classification, Convolutional Neural Network was used for image processing as it has shown a lot of positive achievements in this domain recently. Moreover, the transfer learning methodology was applied to develop and train the neural network architecture or algorithm for the current task. This approach is a deep learning technique that entails applying a model that has already been trained to solve a new task. Thus, the pre-trained model analysed and used in this research is ResNet-50. It was fine-tuned optimally and fed with artificial photorealistic data as input but tested on real existing images. Then, the model achieved a

validation accuracy of 84.5% for the six e-waste categories. Though good result for the selected number of equipment used in this thesis, further research is needed to extend to all EE devices (which implies a larger diversified sample dataset) to further improve performance.

Betreuer der Arbeit: Prof. Dr. Andreas Rausch, PD Dr. Christoph Knieke

Datum: Mittwoch, 08. September 2021, 15:30 Uhr

Ort: Online-Meeting über BBB

Link: <https://webconf.tu-clausthal.de/b/sim-uc9-rvy>