Conclusion

In this paper, a newly created data set for six common Maltese foods has been presented whilst also proposing a solution of how other food datasets could be augmented and automatically annotated, to reduce the manual labour involved in creating such a dataset. The “Maltese Food Dataset” itself is made up of 60 original images and 1,380 augmented images which are split as “test” and “train” at a ratio of 70/30, 70% training and 30% testing. It also includes three random configurations, and, in each configuration, the images are randomly split into the previously mentioned ratio. The food classes included are “Pastizzi”, “Qassatat”, “Qaghaq tal-ghasel”, “Gbejniet”, “Imqaret” and “Zalzett Malti”.

Apart from that, an application making use of Mask R-CNN was proposed to estimate the calorie values for each food of the six food classes. The algorithm was used to detect both the food classes and identify the region of the item at which it is located, whilst simple proportion and a two-euro coin (the reference object) was also used to identify the proportions of each food item in the dataset. The process was also repeated on the three configurations provided by the dataset.

Using the proposed dataset three results per metric where achieved. In identifying the area of the food items, the IoU values are 87.13%, 73.66% and 80.57%. When taking the average of these configs, the value is that of 80.45%. The accuracy for estimating the calorie value using R.M.S.E are +-80.36, +-79.30 and +- 99.50 for the actual predictions, averaging out at a value of +-86.39. On the other hand, the R.M.S.E for the real predictions are +-94.20, +-138.24 and +-75, averaging a value of +-102.65.

In future research, improvement could be made of the proposed solutions in various ways. It would be interesting to provide images which are taken from multiple different angles rather than just a single top view perspective for starters. Another improvement might be to add a way of removing the reference object by training models capable of identifying different plate size. One might also opt to enhance the current research by adding more Maltese food classes to the proposed dataset or even training the model with more variations of the given images.