

3D Object Classification Using Neural Networks

Bc. Miroslav Krabec

Classification of 3D objects is of great interest in the field of artificial intelligence. There are numerous approaches using artificial neural networks to address this problem. They differ mainly in the representation of the 3D model used as input and the network architecture. The goal of this thesis is to explore and test these approaches on publicly available datasets and subject them to independent comparison, which has not so far appeared in the literature. We provide a unified framework allowing to convert the data from common 3D formats. We train and test ten different network on the ModelNet40 and ShapeNetCore datasets. All the networks performed reasonably well in our tests, but we were generally unable to achieve the accuracies reported in the original papers. We suspect this could be due to extensive, albeit unreported, hyperparameter tuning by the authors of the original papers, suggesting this issue would benefit from further research.