

Increasing interest for classification of 3D geometrical data has led to discovery of PointNet, which is a neural network architecture capable of processing unordered point sets. This thesis explores several methods of utilizing conventional point features within PointNet and their impact on classification. Classification performance of the presented methods was experimentally evaluated and compared with a baseline PointNet model on four different datasets. The results of the experiments suggest that some of the considered features can improve classification effectiveness of PointNet on difficult datasets with objects that are not aligned into canonical orientation. In particular, the well known spin image representations can be employed successfully and reliably within PointNet. Furthermore, a feature-based alternative to spatial transformer, which is a sub-network of PointNet responsible for aligning misaligned objects into canonical orientation, have been introduced. Additional experiments demonstrate that the alternative might be competitive with spatial transformer on challenging datasets.