

Abstract: The aim of this thesis is to use deep learning for the task of 3D object recognition. Deep learning has been successfully used for three dimensional data recognition. However, most of the published work chose to represent 3D objects as a set of projected 2D pixel images or in the form of binary voxels. The main goal is to propose an alternative mapping of 3D data to the NN input. Three data representations are introduced: Treating vertex coordinates as a 1D array, projection to a 2D grid and a set of surface oblique lines crossing the significant parts of an object. All of the proposed data representations are tested for the gender classification task using NN and CNN on 3D facial models. We analyzed the impact of coordinate relativization and a new modified dataset created by extracting a nose area from original triangle meshes. Experimental results confirmed the quality of the oblique lines approach with achieved classification accuracies of 84,2% using CNN.