DIPARTIMENTO
DI INGEGNERIA
DELL'INFORMAZIONE

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Project proposals

Jacopo Pegoraro
jacopo.pegoraro@unipd.it

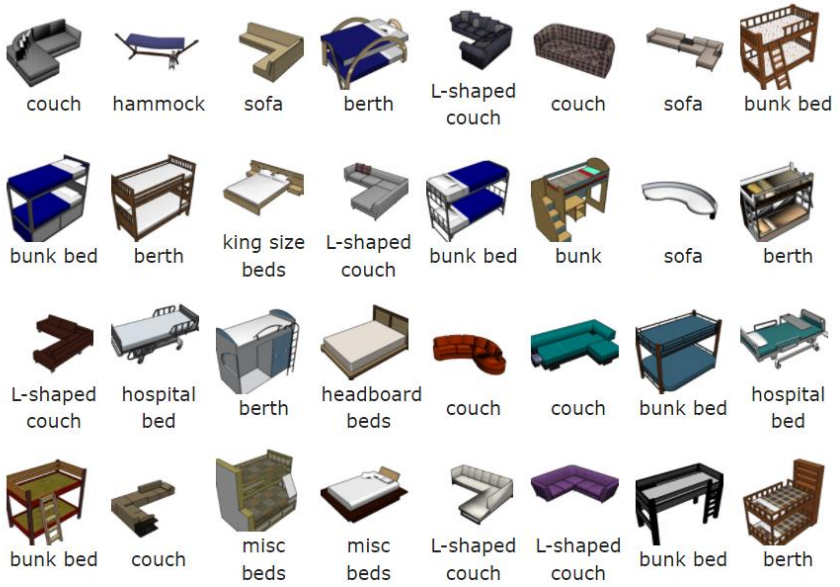
Daniele Mari
daniele.mari@phd.unipd.it

3D Objects Classification

- **Reference paper:** Sedaghat et. al. "Orientation-boosted Voxel Nets for 3D Object Recognition" BMVC 2017.

3D Objects classification

With the recent widespread of immersive technologies 3D data formats (e.g. meshes and point clouds) are becoming every day more important.
Try to solve the 3D model classification task by representing the signal with a 3D voxel representation and by processing it with a CNN



Datasets

- **Datasets**: ModelNet40, ModelNet10, Shapenet.

1. Modelnet: It is a dataset containing CAD models (they need to be transformed in PCs). ModelNet40 contains models from 40 different classes which makes the task harder w.r.t. ModelNet10 that only has 10.
2. Shapenet: Contains CAD models from 55 categories and provides 51300 unique 3D models.

Main Required Steps

1. Get the meshes from Shapenet or Modelnet and transform them in a voxel grid structure
2. Implement and train the network.
3. Implement some improvements to the default CNN to improve performance or speed. Alternatively show the performance of a different type of architecture such as PointNet.