

Geometric Deep Learning for Inverse Graphics

by

Serge Kozlukov

Friday 29th May, 2020 23:52

Submitted to the Center for Computational and Data-Intensive Science and
Engineering

on May 29, 2020, in partial fulfillment of the requirements for the
Master's program in Statistical Learning Theory/Data Science

Abstract

This thesis deals with geometric methods in deep learning. The main contribution is to refine the theoretical grounds of hyperbolic neural networks. On the experimental side, the thesis proposes two proof-of-concept models that attempt to benefit from hyperbolic representations in problems of point cloud and image classification, discusses the failure of these models, and possible ways to fix these failures. As this work does not (yet) achieve the desired goal of constructing principled symmetry and curvature-aware neural layers applicable in computer vision tasks, the author also considers this thesis a map for the future research.