Project Report: Supervised Research Exposition

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1 Problem Statement

Aim is to study the existing methods to find symmetry in 2-d images/3-d point clouds.

2 Introduction

Many real-world objects have similar looking parts; for example, multiple windows on the facade of the building. The symmetry that we are looking for refers to a presence of some form of redundancy or reoccurance in geometric objects. The motivation behind studying and devising the algorithms to find such symmetries is to use them in applications such as image compressions, pattern recognition, shape completion, statistical noise removal.

/**********Put something regarding other widely used methods**********/ Methods using scalar-fields and their contour trees have been used for detecting symmetry in point-cloud data (the underlying algorithm should be applicable for 2d data as well), whereas, graph-based feature matching algorithms have been tried on both 2d as well as 3d data.

Present focus is to study the graph-based implementation methods, wherein various sub-graph matching algorithms are used for symmetry detection. For the ease of study, the problem of symmetry detection has been further broken down to common pattern discovery between two images (ideally we were looking for a reoccuring pattern in a single image), and further to finding the existence of the given specific pattern in an image.

3 Different Approaches

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4 Current Implementation

5 References