

The Doodle Verse

1. Introduction

2. Overview

3. Warmup

a. Procrustes

Here we address the problem of finding the ideal transformation T between our set of feature points F and a predetermined subset of stars $S \subset \mathbb{S}$. Here we are assuming F and S are the same size ($k \times 2$) and represent their respective collections of points in Cartesian coordinates. We want to preserve the shape of F , and for now let's assume we also don't want to change the scale of F : our transformation will preserve distances and angles between points (and thus the shape). This simplifies the problem because it constrains T to be orthogonal. Precisely, we are looking for the orthogonal T that minimizes $\|FT - S\|_F$.

4. Lab