1163-00-1456   **Raymundo Navarrete*** (`raymundo@math.arizona.edu`). *Multi-Perspective, Simultaneous Embedding.*

We describe MPSE: a Multi-Perspective Simultaneous Embedding method for visualizing high-dimensional data, based on multiple pairwise distances between the data points. Specifically, MPSE computes positions for the points in 3D and provides different views into the data by means of 2D projections (planes) that preserve each of the given distance matrices. We consider two versions of the problem: fixed projections and variable projections. MPSE with fixed projections takes as input a set of pairwise distance matrices defined on the data points, along with the same number of projections and embeds the points in 3D so that the pairwise distances are preserved in the given projections. MPSE with variable projections takes as input a set of pairwise distance matrices and embeds the points in 3D while also computing the appropriate projections that preserve the pairwise distances. The proposed approach can be useful in multiple scenarios: from creating simultaneous embedding of multiple graphs on the same set of vertices, to reconstructing a 3D object from multiple 2D snapshots, to analyzing data from multiple points of view. (Received September 15, 2020)