# **BLENDER – Coons Patch**

## Code Explanation

The algorithm reads 4 files that contain a list of 4 control points each. With the control points in each file, the algorithm then constructs Bezier curves using the deCasteljau algorithm. The 4 curves intersect at 4 boundary points. These 4 curves, one from points in each file, are then used to construct Coon’s patch by linearly interpolating points between the 2 sets of curves, producing a ruled surface. Bilinear interpolation is carried out using the 4 boundary points and this surface is subtracted from the sum of surfaces obtained by interpolating the 2 sets of Bezier curves. We now have vertices of points on the patch. The vertices and faces are used to create a mesh and render the image and output the object. Note: Filepaths need to be changed to run this code on a different computer.

The following figure displays the render output:

A picture containing umbrella, accessory, envelope, vector graphics

Description automatically generated

Figure 1: Coons patch