

Animation - moving one point to another

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We want to move point A to the position of point B.

1. Determining the center of mass (CoM) of all points in the cycle:
 - a. Calculate the actual center of mass
 - b. Calculate the center of the circumscribed circle
Since most real twisty puzzles move pieces by turning something, this should always work

Assuming we already know the center of mass (CoM) of all points in the rotation.

1. Assuming every 3d object is a sphere of equal radius:

Then we can just move point A to point B on an arc with origin CoM, crossing through both points.

Since the radius is the same for all spheres, the position and color uniquely define the 3d objects.

2. Assuming cubes of equal size as 3d objects:

Now the position and color is not enough information to describe the 3d object. We also need an orientation of the cube in 3d space. This can be given as a 3d vector whose length encodes the rotation angle and whose direction is normal to one of the cube's faces.

When moving cube A to the position of cube B, we have to change both position and direction vectors continuously.

Rounding errors can accumulate if many moves are made. Therefore at the end of each rotation, the pieces should snap to the position of the object that was previously in that space.

-> save all correct object positions for snapping.