

Our Mathematical Senses

The Geometry Vision

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Lecture - 011

Video 2D: demo: drawing railway tracks

As a starting point, let's try drawing a set of railway tracks with evenly spaced railway tides. Here's a technique for drawing them using just a straight edge. We'll start with a trapezoidal type. The top and bottom edges are parallel, and the side edges meet at a vanishing point. Our task is to construct the next horizontal line, but how can we pinpoint where the next horizontal line will be located? It may be useful to look at a top-down view. As you can see, the tiles are evenly spaced, and our goal is to construct the next horizontal line.

There's very little we can actually do. We have just one, two, three, four, five points. Do you see any points that have not yet been connected by a line? If we use the straight edge to connect these opposite corner points, we create a new point, the center point of the tile, and we can connect this center point to the vanishing point to get yet another point, the midpoint of the top edge of the tile. Do you see what we need to do next? Is there any line we can draw to reveal the next horizontal line? Drawing the line between the bottom corner points and the midpoint does the job perfectly.

We get not one, but two new corner points, and connecting them, we get the next horizontal line. It may be useful to review what we've done so far from the top-down view. We started by finding the center point of the tile by connecting the opposite corners. We next did something interesting, which is impossible in the top-down view. We used the straight edge to join the center point to the vanishing point, which in the top-down view lies off at infinity.

Doing this produced the midpoint of the top edge, which we joined to the two corner

points to construct the next horizontal line. Returning to the perspective view, notice that we can continue this process as long as we want and produce evenly spaced railway ties that gradually approach the horizon line. I'll leave it as a puzzle for you to figure out how to complete the second perspective view of the tile floor using this technique. Thanks for watching.