

Our Mathematical Senses

The Geometry Vision

Prof. Vijay Ravikumar

Department of Mathematics

Indian Institute of Technology- Madras

Lecture - 08

Video 2A: three views of a tiled floor

Okay, so we now want to look at the second question that we raised in the introduction, which is how we can use vanishing points to do different tasks. So before we get to perspective drawing, I want to look at how we can use vanishing points to solve certain puzzles, which do involve perspective drawing, but we're going to get into the details of perspective drawing later. So to begin with, I want to look at these same three views of a tiled floor that we looked at in the course teaser. And in particular, this is not just any tiled floor, it's an evenly spaced square tiled floor. And the interesting thing is that in all of these three perspective views, we somehow automatically get a sense that these are the same tiled floor and they're all representations of a square tiled floor. We can kind of sense that these are squares, even though their sizes and shapes keep varying.

So in the intro video, in the teaser, we saw how to draw one and two using a compass and straight edge, and starting from a single tile. So with the first view, we started with a tile like that and extended it to this grid configuration with a compass and straight edge. With the second one, we did something similar. We started with a single trapezoidal tile and with our compass and straight edge, we extended it.

We were also, finally we looked at this third tile, but I left that as a challenge for you to try and figure out. In particular, we claimed that we can construct this perspective view, but in this case with just a straight edge alone. So I want to look at that question again. In particular, if we just take that tile and forget everything else, using just a straight edge, can you extend this tile to a full perspective view of the tiled floor? And you should get something like this. But before I tell you how to do it, I think I would strongly encourage you to try this yourself.

So in the next video, we're going to do a hands-on tutorial of it where you can see one solution. But before watching it, definitely try trace it. You could either trace this image or you could click the link below, either in YouTube or on the companion page, to get a printable version of it. And then with a pencil and a straight edge, you can try reconstructing this perspective view. And the reason that I would strongly encourage you to do it is not just because it's a fun exercise, but because there's certain aspects of it that you can only understand.

I believe you can only understand by actually doing it. Even watching the next video, while it might give you a hint if you're stuck, the kind of insight you'll get by actually doing it is quite different. So please, please, please do try it yourself. And you might find that it's actually quite surprising how it works out. So good luck.