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So when you were told that 'sound is made up of waves at different frequencies', what do you feel about it? Belief or disbelief? Similarly, when people told you that pictures are made up of waves at different frequencies, what is your take?

The way I make myself believe that sound is made up of different frequency waves is, I used Audacity, pick a sound wave at a single frequency, then play it. So I believed it. Then I was happy to move on using Fourier analysis to analyze the frequency components. But if you think about it, I've never experienced sound as oscillating wave! A sound which I feel constant is an oscillating wave, and I certainly did not hear the wiggling!

Now to the image. First of all, if image is made up of waves, what do those sine waves represent? In the case of sound waves, they represent the oscillating amplitude (air pressure), even though my ear cannot capture the change. As GPT explained, the values represent pixel value, in the case of black-n-while picture, they represent the brightness of that pixel. If the brightness values are oscillating, then we will SEE waves. I think that's a fundamental difference between sound and images:

1. In sound analysis, we were told there are waves, even though we play 'wave', we don't actually hear the jiggling.

2. But in image analysis, we were told there are waves, then we can see the oscillating brightness turned into wave that we can see.
   But I still find it hard to believe that any images are made up of waves at different frequencies!

So, I asked GPT for a step-by-step exercise showing us how by adding more waves, we can transform from simple wave image to other shapes. It gives me 20 pages in 1 min, impressive. But looking at them, I have questions:

1. Did I see wave in the first case, the single wave?

2. But which way is it oscillating?

3. Yes, it's horizontal stripes, but does it mean the value is oscillating in x direction? Ok GPT confirms that I was right.

Then I asked for more interesting shape, because the image of some straight lines intersecting at an origin is not interesting. Then it proposes a mountain silhouette, which is boring too. But then a idea hit me: the point of using waves to create image is not for animation! If you know the shape, you just draw it! There is no need to back-solve for waves and then reconstruct using waves! It's an overkill! The value of Fourier analysis in imaging is medical imaging where you CAN'T see the shape! You collect signals, you use those signals to analyze the waves to reconstruct the image! But then it leads to more questions…

If we know the image, meaning we have the pixel values at each point, we can run Fourier analysis, coming up with the waves, then recombing to recreate the images. But in the case of medical imaging, we are not analyzing each pixel, because we don't have a picture to start with. We have signals, but what do those signals mean so that will allow us to come up with the waves, then these waves are for

what? In the first case, the waves are for pixel values directly, but here what do these waves represent then?