A Note on Pitch Detection

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The Dominant Pitch Has the Highest Amplitude

When I check the Internet, from what I hear there are many pitch detection algorithms, that seem to try and find an integral of frequencies used by a voice or instrument, or that's what it looks like. In terms of pitch, it's never about the integral of the harmonics. It's about which specific frequency is the loudest.

When I sing a tone, this tone has overtones and undertones: resonant frequencies other than the main frequency that add color to my voice and identify my voice as mine. In the same way, guitars, pianos, mouth harps, and other instruments have undertones and overtones of respectively lower and higher harmonic frequencies.

These harmonic frequencies don't in any way determine the pitch. They only determine what instrument you are listening to and make this instrument recognizable to the ear.

That should be the real challenge to scientists: can the computer learn to discern specific instruments and also produce tones making them sound like instruments through mathematical algorithms?

The pitch is only one frequency and it's the loudest of them all. This shouldn't be too hard to detect. When I look at the frequency spectrum analysis by a computer they are quite detailed, represented by a digital oscilloscope.

What do we look for then? Essentially, you make quick to humans visual snapshots of these frequency spectrum analyzers, to computers tables of values, and determine what frequency has the highest amplitude in terms of resonance. The specific frequency with the highest amplitude is the actual pitch of the voice or instrument.

This should also eliminate the need to sing a specific vowel into a microphone and then to force people to always use this vowel to sing their different pitches. I was once told to use the vowel "Uh" and ironically immediately nailed the exercise. Quite frequently, when I listen back to the recording, I feel the computer is just getting it wrong.

The answer is to find the dominant frequency in terms of the highest amplitude. It's the only correct answer to how you find the pitch of a tone produced by any instrument including the voice.

The fact that digital oscilloscopes are prevalent in science today, shows that it should be simple to do this. A tuner can as such also be simplified and used with any instrument, including the voice. It's not difficult. The problem we face is that people continuously search for a difficult solution, without looking at the simple nature of the beast first.