

GEAR

SYNTH SENSE

Dream Theater's Jordan Rudess lets you in on the secrets to making your synthesizer sounds soar

If you've listened to pop music created since the 1960s, there's little doubt you've heard synthesizers at work. Innovators have been trying since the 1800s to create devices to replicate sounds otherwise unavailable to the layman, but it was only in the last four decades that the synthesizer became thought of as an instrument in its own right. With today's technology, synthesizers—digital and analog, software and hardware—offer nearly limitless options when it comes to creating sounds and textures. But how to best harness their complexity and power for your own purposes?

For answers, we turned to Juilliard-trained synthesizer wizard Jordan Rudess. Rudess has for the last dozen years served as keyboardist for prog-metal band Dream Theater, and co-wrote eight of the nine songs on the group's new album *A Dramatic Turn of Events*. In addition to releasing a dozen solo albums, the 55-year-old native New

Yorker has recorded with David Bowie, Steven Wilson, Vinnie Moore and Dream Theater offshoot Liquid Tension Experiment. He also created the Jordan Rudess Online Conservatory and founded Wizdom Music, which creates popular software synthesizer programs for the iPhone and iPad.

What is a synthesizer?

It's an electronic instrument—which can be hardware or software, with a keyboard attached or without one—that's capable of creating and shaping sound in different ways. Synthesis is such a deep and interesting world because there are many different types of synthesis and they each create such unique results.

What's the most basic type?

Subtractive synthesis was used in famous older instruments like the ARP 2600 [1971] and Minimoog [1970]. It involves oscillators,

which create basic sonic waveforms, and types of filters that take away harmonics from the sound. Other techniques like additive synthesis get very interesting because you can create very realistic or completely unrealistic sounds with multiple sine waves, and then have access to all of the sound's harmonics. One great additive synthesizer is Camel Audio's Alchemy. Working on it feels like you're playing with Mother Nature. Other more complex types of synthesis include frequency modulation and physical modeling, which is very math-intensive.

What's the difference between digital and analog?

On a very basic level, analog is naturally more continuous when it comes to sound—because digital synths use ones and zeros, and analog synthesizers use completely different circuitry. When you play older analog synths like the

Minimoog, you can turn the filter knob very slowly and hear the sound change organically and smoothly. But with early digital synths, if you turned a filter or slider slowly you'd hear a "zipper effect"—audible stepping from one digital value to another. Fortunately, synthesizer makers have become much more familiar with digital, so digital synths are smoother than they used to be.

What synths do you use?

With Dream Theater I rely most on sampling. I'm called upon to recreate many types of existing sounds, like strings, brass, choirs and such. The instrument I use onstage is the Korg Kronos, which has a lot of different types of synthesis built into it. I'm able to play the samples I need, and then modify them with parameters of various types of synthesis.

What are some others you like?

The MOTIF series from Yamaha is very popular. Roland offers the Fantom series and the V-Synth, which was an amazing instrument when it came out. If you're someone who likes to explore sound, the V-Synth really pushes the boundaries.

How did you learn to use synths?

I started on the Minimoog, so I have a definite love of good subtractive synths. I learned to turn knobs and hear how they affected the sound. Without any technical knowledge, I was able to understand what every combination of settings did. It was only years later, when I started working as a synthesizer product specialist, that I started to fill in the blanks. "So that's what envelope and modulation cutoff mean!" Before that, they were just funny words underneath knobs.

How can aspiring users learn more?

They should go back and experience an analog, subtractive synthesizer. It's a perfect way to get into it. Even if you can't afford a hardware subtractive synth like a Minimoog, there are lots of cheap or free software synthesizers online, or on the iPhone or iPad. One amazing subtractive synth is called TempoRubato NLog. Beyond that, it's important to seek an education on synthesis. Things have gotten so deep with audio technology that each type of synthesis is a course of study unto itself.



Joe Kaiser

Jordan Rudess

Why are subtractive synths important?

Understanding what a low-pass filter is can help you shape the sounds you want. If you have the sound of a piano, for example, and your cutoff filter is open all the way, you hear its full harmonic content. If you lower the filter, it starts to dampen the harmonics of the sound, so the more you turn it on, the less you hear. If you close it all the way, the sound vanishes. It's important to learn about ADSR, which stands for "Attack, Decay, Sustain, Release." Changing the attack of a sound, for example,

'Some say you can't make music with a computer. I believe music can be made in any way!'

—Jordan Rudess

alters how aggressively and quickly it enters the acoustical environment—and that changes the whole character of what you're playing.

What are some of the iPhone synths you've created?

One is called SampleWiz, which is basically a sampler. It also uses granular synthesis, which



Alejandro Vidal/Courtesy of Leah

Murcof

is a fascinating type of synthesis that lets you take small pieces of an audio waveform and manipulate them. You can effectively speed up and slow down bits of sound with a very interesting effect. I also came out with MorphWiz, which lets you trigger notes on the touch screen and then bend the pitches

of each note individually. On almost every hardware keyboard synthesizer, when you play a chord and move the pitch, you end up moving the entire event—all the notes that you played. But with MorphWiz, you have more control.

Who pioneered the use of synths?

When I was getting into synthesizers, Morton Subotnick really influenced me with his album *Touch* [1969]. Around that same time, I discovered [Isao] Tomita, who did beautiful things with synthesizers. He did an entire album of Debussy [*Snowflakes Are Dancing*, 1974] and was a real master. From more of a keyboardist perspective, Keith Emerson, Rick Wakeman and Patrick Moraz were huge. They captured a moment and did amazing things with technology that

pushed music forward. Moraz, for example, took the idea of bending pitch on a synthesizer and brought it into the rock world. That was a big change. Jan Hammer and George Duke were also masters of bending pitch and using synthesizers in a very musical, expressive way.

Who's doing cutting-edge work now?

Today there's an incredible movement with electronic music. Aphex Twin changed things with the song "Bucephalus Bouncing Ball" [1997], which makes great use of musical "stutters" that speed up and slow down very expressively during the track. I'm also a fan of Murcof, who has such a beautiful way of working with electronic sounds. Autechre is another awesome electronic group. They sculpt their music like architects, every sound is so well crafted and measured. Some say you can't make music if you don't play piano or violin—"If you use a computer, it's not real!" I believe music can be made in any way, and Autechre is evidence of that. What they're crafting is so musical and expressive in its own way.

—Michael Gallant