

Music Startup Unravels the Mystery of Songwriting with Data

🔗 thecrazymind.com/2020/07/music-startup-unravel-mystery-of.html

Are you a musician who has struggled with songwriting and can't seem to grasp what makes a song work or not? Three Berkeley friends with a passion for music and technology co-founded Hooktheory to decipher the mystery. For close to a decade, these music aficionados from around the world have contributed to Hooktheory's Tab, world's largest database of popular song analyses. Hooktheory's co-founders and innovators, Dave Carlton, Chris Anderson, and Ryan Miyakawa, have grown this database into a massive community effort, with over **20,000 analyses of songs spanning all genres of music from Beyonce to Bon Jovi to The Beatles.**

“We've had an enormous response from our community of users who contribute to and maintain the Theorytab database every day,” said Chris Anderson, “We're collaborating with researchers and developers in both the music and AI spaces, and believe that this data can reveal musical aspects that make us so drawn to our favorite songs, as well as provide a powerful tool for helping songwriters and musicians in their own musical pursuits.

The Crazy Mind wanted to dig deeper, and conducted this email interview with the trio.



from left to right - Chris Anderson, Ryan Miyakawa and Dave Carlton

How does data help unravel the mysteries of songwriting today?

Hooktheory: The advent of big data is really revolutionizing the way that we think about and understand nearly every aspect of our lives. Most people are familiar with the concept of Google, Facebook or Netflix using search preferences to suggest ads, articles or shows that we might like, but many people may not realize that data can also be used to help us understand fundamental truths about our world.

At Hooktheory, one of the big questions that we're trying to answer is simply "what makes a great song?". Why is it that some songs are instantly forgettable, but others are so catchy that we're singing them for days on end? If we can gain some insight into these questions, that knowledge will be immensely helpful for aspiring songwriters who are trying to create the next hit song.

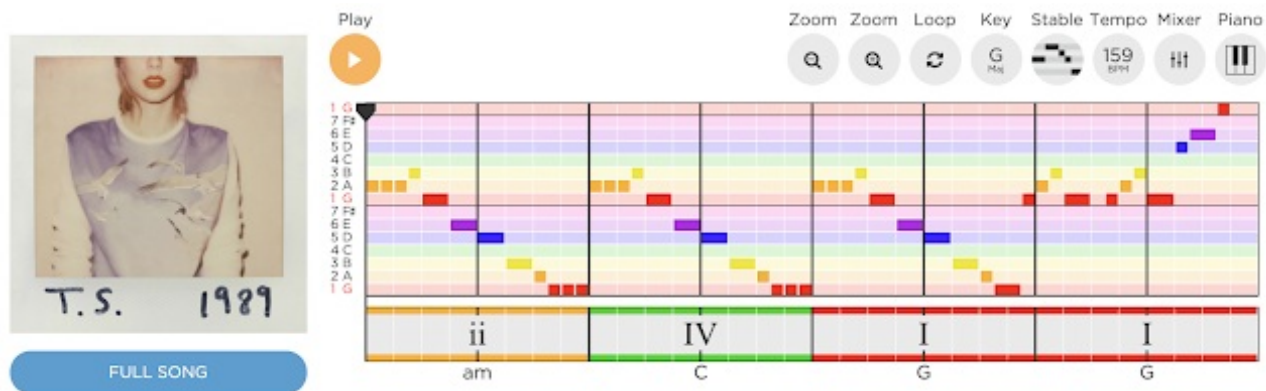
To do this, we knew we needed to get a lot of data. In this data, we needed analyses of the melody and chord progressions to as many popular songs as possible. This is the origin of the "Theorytab database" at Hooktheory. At first we were analyzing all the songs ourselves,

but soon Hooktheory users were eager to submit analyses themselves, and the project has grown into a massive community effort.

Tell us more about your Theorytab database. What is a Theorytab and what makes it special?

Hooktheory: A “Theorytab” is an analysis of the melody and chord progression of a song using Hooktheory’s special notation and synced up to the audio of the song via its YouTube video.

Theorytab of the chorus to “Hey Jude by The Beatles”



Theorytab of the chorus to “Shake It Off” by Taylor Swift

A theorytab is similar to a guitar tab, in that it shows the chords to a song, but it also contains music theory information, like how each chord and melody note relates to the key of the song. This last part is important, because it allows us to find patterns and compare music ideas in songs that are written in different keys.

Because the theorytab database is a community effort, anybody is welcome to contribute or edit a theorytab at Hooktheory. In this way it is similar to Wikipedia, where users are responsible for maintaining all of the content. We have an extraordinary community of users that have contributed over 20,000 Theorytabs to date, and this number is growing every day.

What sort of responses do you get from your community?

We’ve had an extremely positive response from the Hooktheory community. Users really

take ownership of their analyses on the site, and do a great job moderating the content. Users also love that we've integrated the Theorytab database with our songwriting software Hookpad, so they can tap into the data as they write their own songs, getting chord suggestions or starting with chord progressions that have already been used in popular songs.

We've also had a great response from music educators who use Hooktheory to teach music theory and songwriting to K-12 students. They love that their students can learn music from songs that they know and love, rather than classical music which they might be less interested in. It's been really inspiring to see all of the younger kids exercising their creativity by writing songs on our site.

Have you learned anything interesting by going through this data?

When we first started out, we were asking simple questions like, "What is the most popular key?", and "What are the most popular chords". It turns out C Major and G Major are the top keys, probably because these are the easiest keys to play on the piano and guitar, respectively, and the most popular chord in a song is typically the "tonic chord", or the chord that represents the key of the song. While these results were interesting, we wanted to ask questions that we didn't necessarily have an intuition about.

We then started asking questions like, "given a specific sequence of chords, what is the most likely continuation?" This is when things started to become exciting, because we were finding patterns that exist across hit songs. This meant that understanding these patterns could be a clue to the types of decisions that can make great chord progressions and great songs. We summarized some of our results in this [article](#), but this is an ongoing investigation, and we are continuing to learn more and more as the database grows.

How does this relate to machine learning and artificial intelligence, and how will these tools shape the future of songwriting?

In machine learning jargon, what we've been mostly doing is what's called "feature engineering." This means that we are using the data to answer specific questions we have in mind (like "what chord progressions are most popular?"), and using the results of these investigations to inform our understanding of how a song works. However, a big part of machine learning is actually to let a computer sort through the data and come up with its own conclusions without any human guidance. This approach is remarkably effective, especially in the presence of a large amount of data. While we haven't used this approach much yet, it is definitely a direction that we want to pursue.

You can imagine a future where computers could automatically generate chord progressions and melodies that could be used to build hit songs right out of the box. Already researchers at Google's Magenta project have built algorithms that can write classical music in the style of Bach that are highly convincing. Ultimately though, I believe that there is a very human aspect of music as an artform, and I don't think that computers will ever completely replace human songwriters. However, I do think that songwriting artificial intelligence could eventually be an extremely powerful tool in every songwriter's toolbox. If Hooktheory can be a part of that development, that would be amazing. ---

The Crazy Mind invite you to explore Hooktheory and discover Hookpad, a musical sketchpad used by professional and amateur musicians alike and Book Series, to learn how to craft melodies and chord progressions like professional musicians.