

Are You Listening to Spotify, Or Is Spotify Listening to You? A Look into AI Algorithms on Music Streaming Services

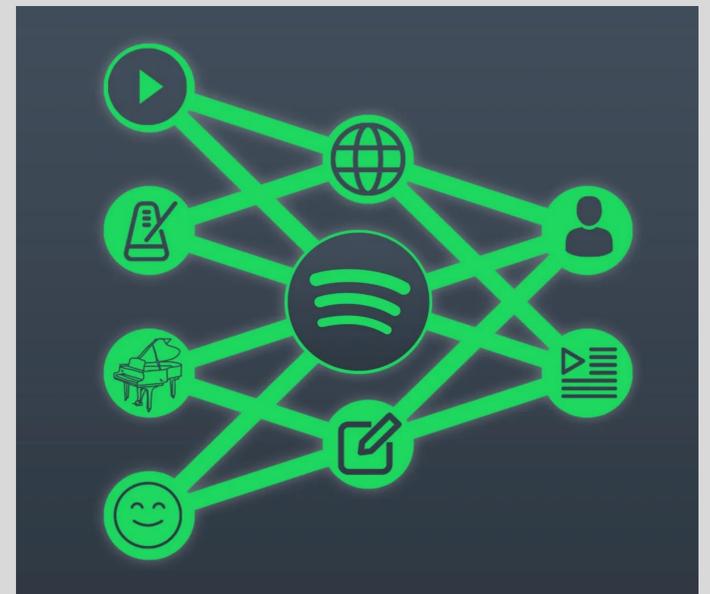
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MUAI 201: Music Business

Spotify is the most popular music streaming service, hosting more than 675 million users in over 100 countries.

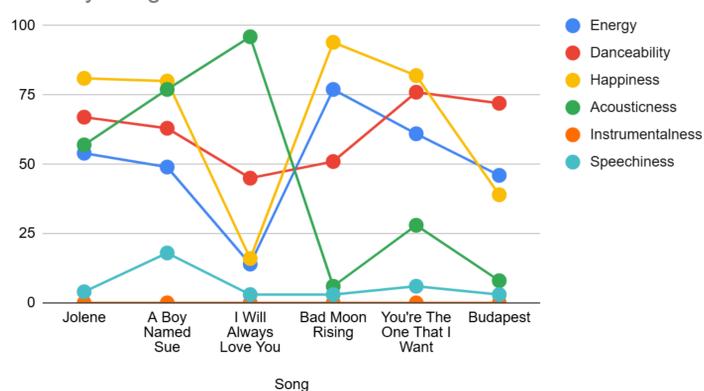
In recent years, Spotify has launched several AI features throughout its platform, meant to engage listeners with music and recommend them new songs based off of what they've been listening to: **Spotify DJ**, and **Smart Shuffle**. They also utilize AI in their algorithms when people upload music to categorize each song and properly push it to the right people. They analyze songs based on:

- **"Acousticness"**—the probably that your track uses more or less acoustic instruments
- **"Danceability"**—an analysis of tempo, rhythm and beat qualities that make a song more or less danceable
- **Energy**—a measure that reflects perceived energy and intensity
- **"Instrumentalness"**—measures the presence or lack thereof of vocals in a track
- **"Speechiness"**—measures the presence of spoken word vs. singing in your track
- **Happiness (Valence)**—estimates perceived positivity or negativity in your music
- They also consider **duration, time signature, tempo, mode, loudness** (in dB) and the **key** of each song – all easily analyzable (Lavoie).

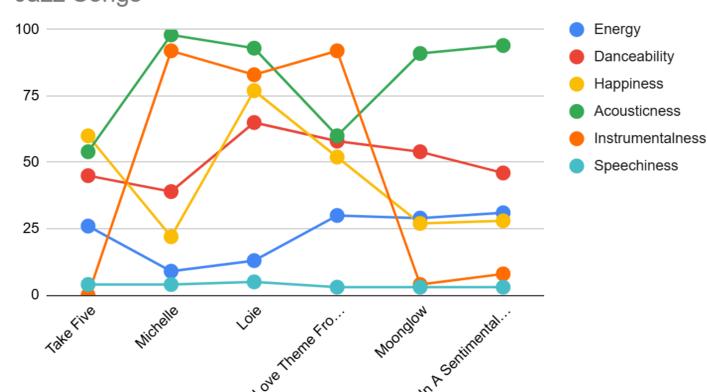


The purpose of our research is to determine whether Spotify's suggestion algorithm truly depends on the criteria listed above. While conducting our research we have employed the use of tunebat.com, an AI software in which you input a song and it provides details of the aforementioned characteristics. We took 4 base genres, choosing one “popular” song within each, and let Spotify AI generate songs based off of that pick before analyzing it through Tunebat. The similarity of the songs is noted by how the contour of each line matches from song to song.

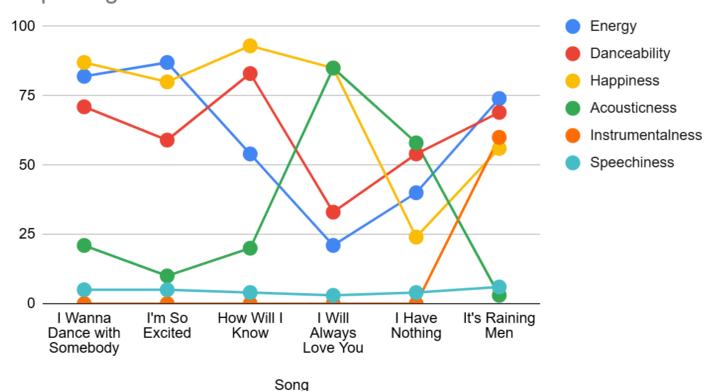
Country Songs



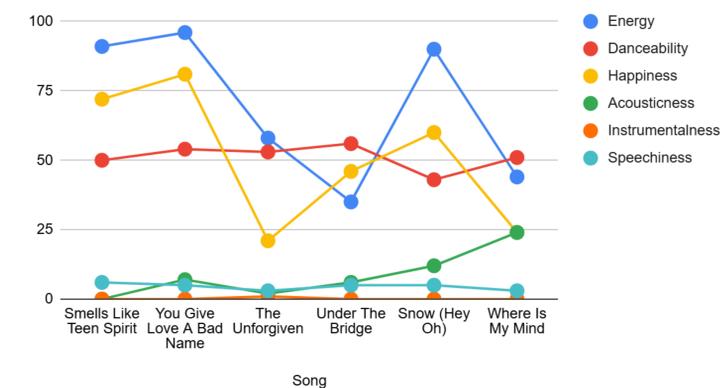
Jazz Songs



Pop Songs



Rock Songs



While the process of understanding how to calculate something like “danceability” leaves something to be desired, the data above shows the consistency of the Smart Shuffle AI in choosing songs within a genre. We found the algorithm has a habit of swinging back and forth between tempo and “acousticness,” favoring songs with higher danceability and little to no “speechiness.” The Rock genre also generally had the most similarity from song to song with each data point. It is important to note that because we each used new Spotify accounts with no prior listening history, these results may have been different depending on if we had used accounts with data and listening preferences already embedded into the algorithm.

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