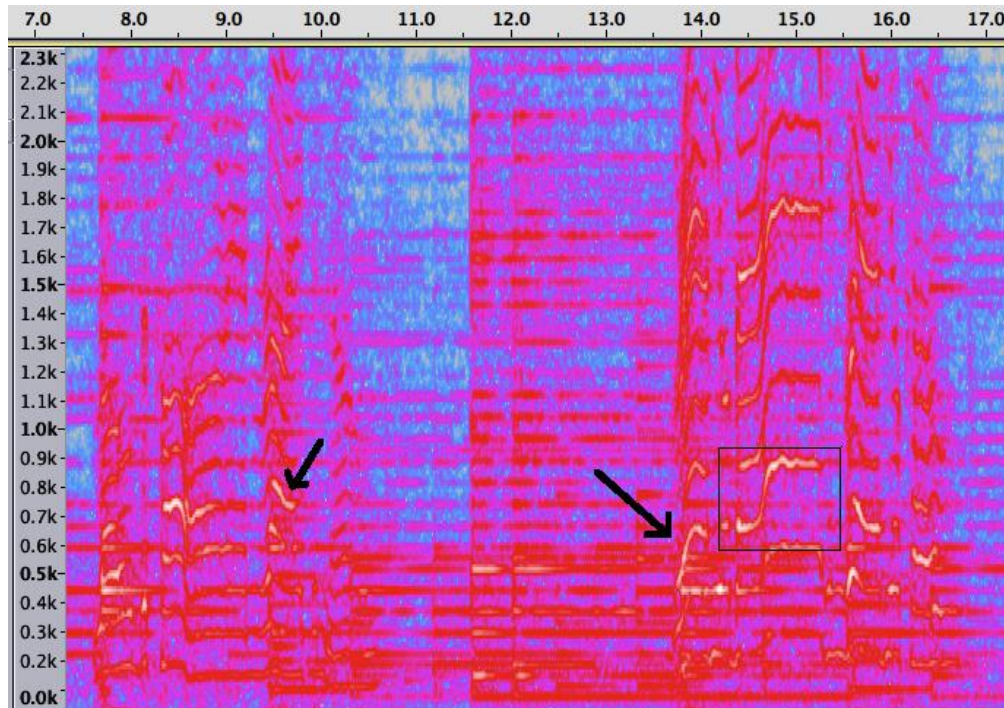


## Quantitative Emotion in the Avett Brother's "I and Love and You"

Music is one of the most fundamental forms of entertainment. It is an art form that has been around since the prehistoric eras of our world. Since its creation, it has continually evolved into many different forms. The music of my generation is much different than the music of my parents' generation. However, at the same time the two generations of music share the same roots. The Avett Brothers have evolved from folk and country rock, as well as share roots with pop and bluegrass. Their hit song "I and Love and You" was released on their 2009 album *I and Love and You* and is a great example of current music created with real instruments and real people – it is not completely electronic like a lot of popular music today. Nevertheless, we can utilize electronic methods, such as the use of the spectrogram, to analyze this musical piece. The organization of the song is such that it takes the listener on an emotional journey. I have divided the piece into five sections in which we will use musical and mathematical methods to discover what musical phenomena are occurring within the song and how these phenomena tell this song's story and evoke emotion in the listener.

The introduction of the song starts out softly with Scott Avett singing and Seth Avett playing the piano. Scott Avett's vocal style is non-traditional as he rarely ever hits a pitch right away, but instead slides his voice up or down from one note to another. This phenomenon is visible on the spectrogram as short, steeply curved lines [Figure 1]. In some places, one could even say that he is using a *legato* – Italian for "tied together" – where he transitions from one note to the next without any break or silence. This way of singing

gives the song a more natural feel. It is less formal and allows the listener to feel his raw emotion.



**Figure 1. The arrows on this spectrogram from the introduction indicate harmonics where Scott’s sliding vocal technique is visible. The box indicates his use of legato.**

In addition to the personal feel introduced by the vocals of this section, a base rhythm is established by the bass clef notes of the piano from measures three through eight [see score available [here](#)]. The rhythm established is a cyclic rhythm, with fourteen beats per cycle (two measures worth). It is composed of a half note followed by a quarter note for the first measure, and then a dotted quarter note, followed by an eighth note, followed by a half note in the second measure [Figure 2.1]. This cyclic rhythm repeats itself various times throughout the song, and its presence in the introduction establishes a driving rhythmic base for the rest of the piece. Figure 2 represents the note onsets of the cyclic rhythm using the circle method.

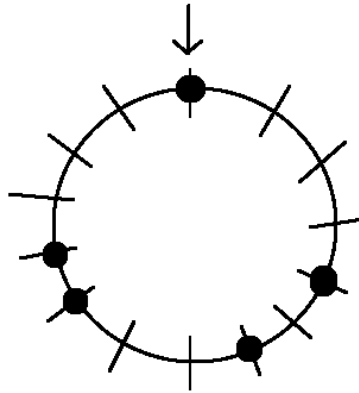
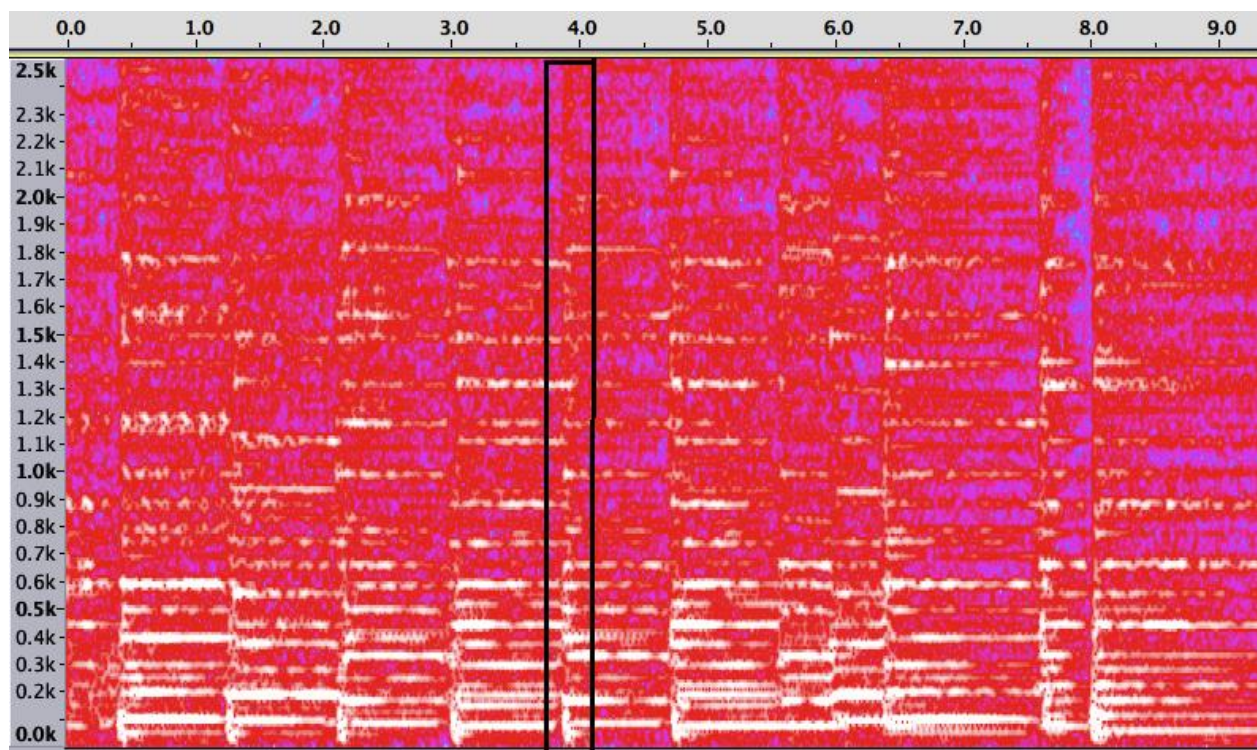


Figure 2. Two measures of rhythm of bass clef piano notes. Arrow indicates first note onset.

Figure 2.1. The blue, green, and yellow boxes represent one cycle of the cyclic rhythm. The red brackets encompass all three cycles from the introduction.

The song continues adding instruments until it includes all of the instruments used for the piece – the piano, drum set, and viola. The presence of all these instruments as well as a few other factors contribute to the rising tension of the song. The part of the song to be analyzed is displayed by a spectrogram of a clip from the song in Figure 3. As you can see there are very bright white lines throughout the spectrogram, which indicate loudness. The Avett Brothers' use of loud dynamics in this passage creates a sense of urgency as well as passion. The dark vertical lines throughout the spectrogram indicate firm, exact percussive strikes in unison by all of the instruments. This creates a driving feeling, which also adds to the rising tension of the song. In this section there is a lack of vocals, which also adds to the drama.



**Figure 3. The box indicates one of the dark vertical lines caused by the percussive onset of all of the instruments at the same time.**

The final contributing factors to the rising tension from this section are the chord progression and beating created by this progression. Each percussive onset indicates a new chord, and the chord progression is as follows, and was derived from the part of the score found in Figure 4.

**D: IV->iii->ii->I->ii->I->iii->IV->V**

The image shows a musical score excerpt with two systems of piano accompaniment. The first system includes the lyrics "Brook-lyn, Brook - lyn take me in." and the second system includes "Three words that be - came hard - to". Red brackets highlight specific measures in both systems where the chords from the progression D: IV->iii->ii->I->ii->I->iii->IV->V are found. The chords are labeled above the notes: D, G, D, G, F#m, Em, D, Em, D, Em, F#m, G, A, D, G.

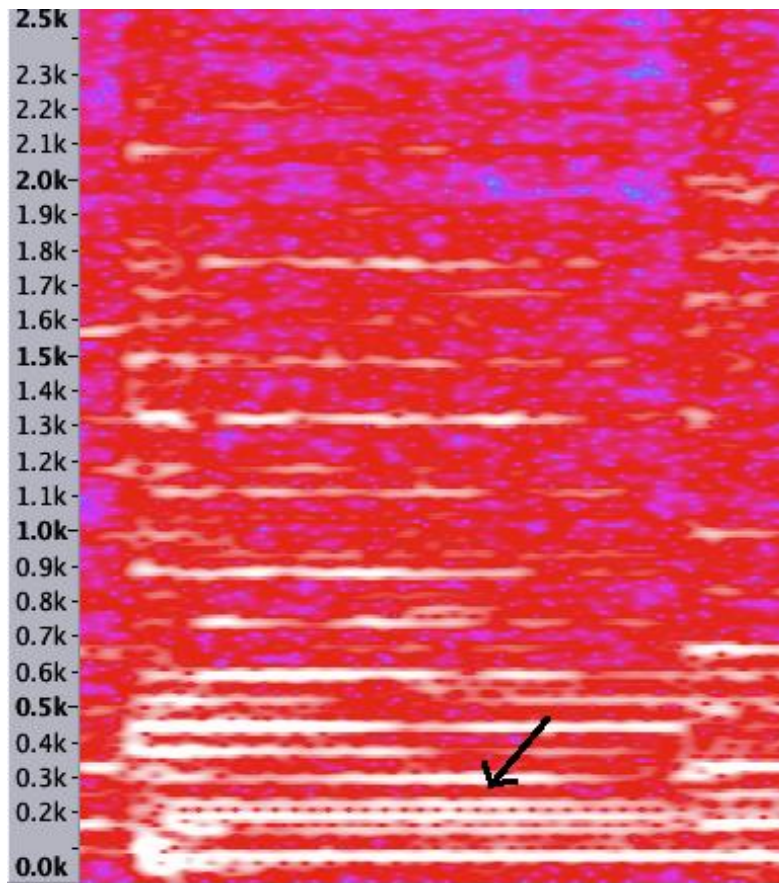
**Figure 4. This excerpt is found on page 5 of the score. The red brackets indicate the measures where the chords from the chord progression are found.**

This chord progression creates a lot of tension because there is dissonance created from significant beating found during the alternation between the **ii** chord and the **I** chord.

Beating is a phenomenon that occurs when the frequencies of the harmonics of two notes are very close to one another and they clash with each other, causing dissonance. This clash is seen between the two notes D<sub>2</sub> and E<sub>2</sub>, which have third harmonics at frequencies of 219 Hertz and 246 Hertz, respectively. The notes are not played at the same time, but since the chords containing these notes are alternated, and tones played on the piano are sustained,



the residual harmonics clash. One can see this beating on the spectrogram in Figure 4.1 as alternation between light and dark spots, almost a checkered look, just above 200 Hertz. The chord progression itself ends with the dominant **V** chord, which contains the leading tone, C#. The dominant cord, because it contains the leading tone, creates a sense of anticipation that can be resolved by the tonic **I** chord. However, the end of this section is a “cliff hanger” in that there is no tonic **I** chord to resolve the tension left by the **V** chord.



**Figure 4.1 Beating between the third harmonics of  $D_2$  and  $E_2$ .**

The third section of the piece offers some relief to the tension created in the previous one. The instrumentation is simplified again to just the piano and Scott Avett’s voice. This part of the song is very emotional and contains the most recognizable chord progression of the song, with percussive note onsets that correspond directly with the

vocals that relay to the listener the separate words from the song title “I and Love and You”. This chord progression is as follows, and the original chords can be found in the excerpt of the score in Figure 5.

**D: vi->V->IV**

The image shows a musical score excerpt for the song "I and Love and You". It consists of two staves. The top staff is the vocal line, with lyrics "I and love and you." written below it. Above the staff, the chords Bm, A, and G are indicated. The bottom staff is the piano accompaniment, with a red box highlighting the first three measures. The word "rubato" is written in the first measure of the piano staff.

**Figure 5. This excerpt is found on page 6 of the score and illustrates the famous chord progression from this song.**

With this chord progression there is alternation between weak resolution and tension. This is because the previous progression ends in **V**, which “deceptively resolves to **vi**. The tension then reappears with the **V** chord and is weakly resolved by the **IV** chord. Since the tonic **I** chord is not employed, the resolution is not complete.

The fourth section of the song is the climax. This is the busiest part of the song with full instrumentation and vocals. There is a driving force in the section by the piano with loud percussive chords, layered with beautiful riffs played by the viola. These riffs express a sad almost abandoned feeling, and soften the music with their vibrato (see Figure 6). The most emotional part of this section is displayed by a vocal echo by Seth Avett, which sounds somewhat like a howl. This howl of pain and display of raw emotion might be missed if one

is not really listening for it, but it is displayed perfectly on the spectrogram by a bright, curved line (see Figure 7).

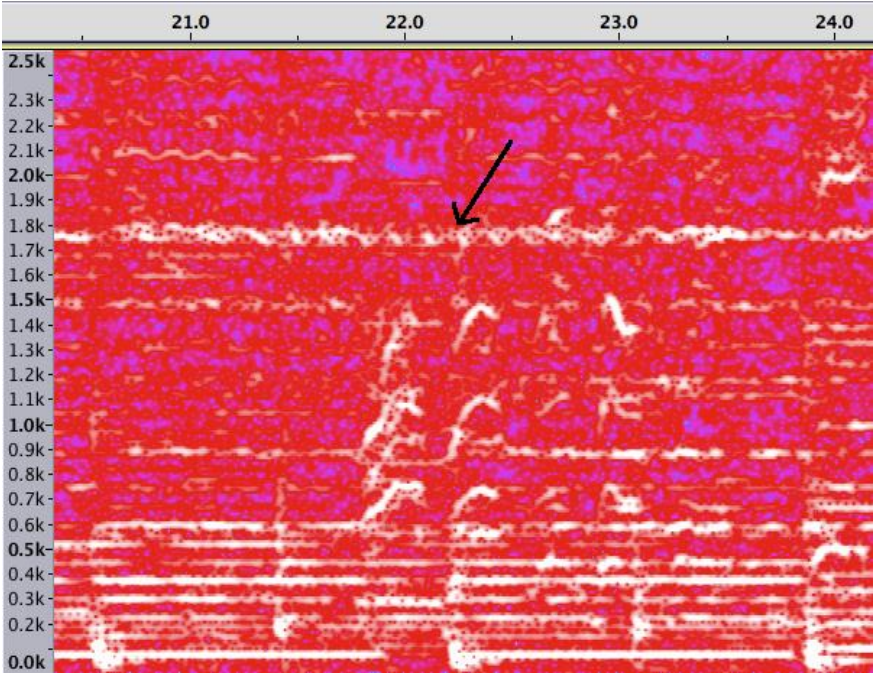


Figure 6. Vibrato from the viola.

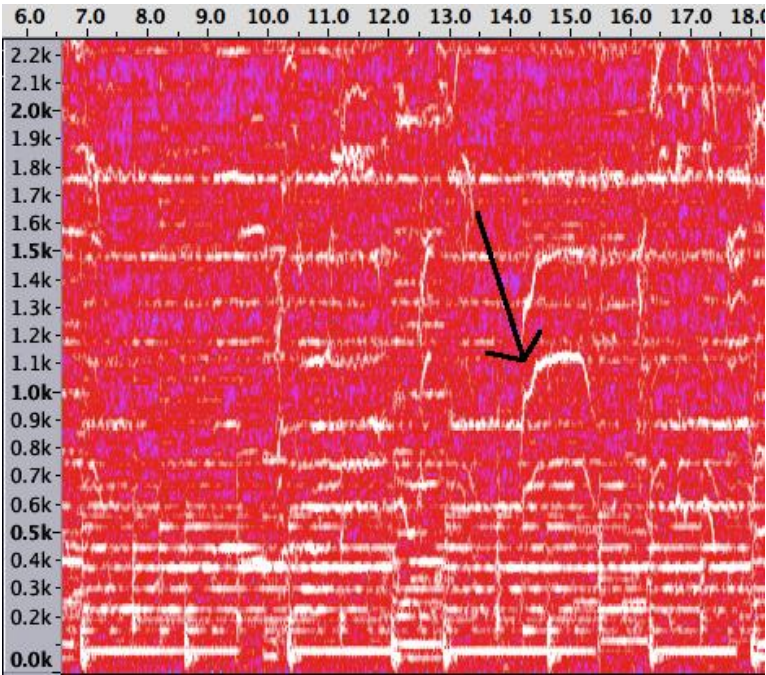
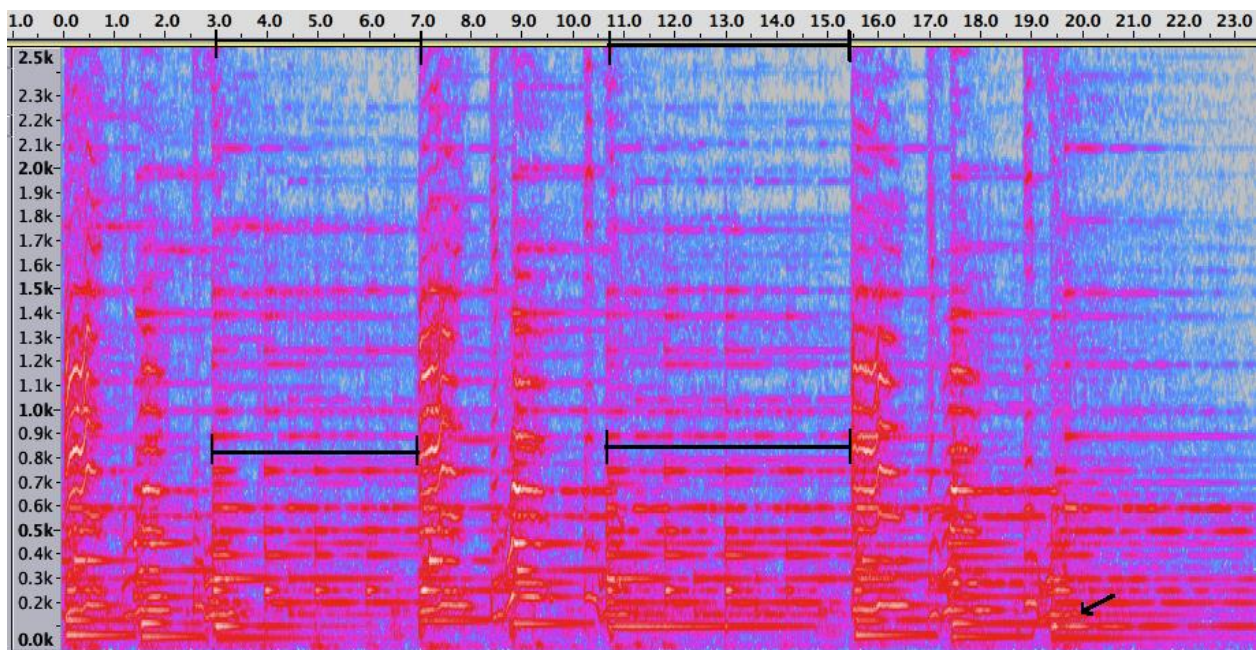


Figure 7. Vocal howl/echo by Seth Avett.



The piece is finished in a very calm and quiet manner, giving a final answer to the intense climax of the fourth section. The fifth section of this song is characterized by three iterations of the chord progression from section three: **vi**->**V**->**IV**, along with the vocals singing the words “I and love and you”. The tempo during this section slows down significantly, adding drama to the ending of the song. This can be seen on the spectrogram in Figure 8 as a widening of the gap between the **IV** chord of the second iteration and the **iv** chord of the third iteration, in comparison to the gap between those of the first and second iterations of the chord progression. The final iteration of “I and love and you” sung by Scott Avett, gives a sense of finality. The final note he sings for the word “you” is just a tiny bit lower than that of the other iterations [Figure 8] which is like the end of a sentence, a story, or a journey.



**Figure 8. Widening of the gap between onsets of chord sequences displays the slowing down of the tempo. The arrow indicates the final, lowest note.**

Many people think that music is just a feeling, something qualitative to enjoy solely by listening to. However, the spectrograms and mathematical tools used to analyze this song help one to appreciate the quantitative aspects of music too. They help to reveal quantitatively what is going on musically in a song, or why we feel a certain way when we listen to it. The Avett Brothers have created some very special music for our generation. They are real people who use traditional instruments to evoke the real, timeless emotions that we have seen through the quantitative methods used in this analysis.

**Link to song:** <http://www.youtube.com/watch?v=mrsgIEBwIZM>