A Bringer of Jollity

A study in classical music and rhythm games

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Introduction

Osu is a free rhythm game that challenges the player to a seemingly simple task: Click the circles to the beat. The actual difficulty of this task depends on the beatmap—or the arrangement of circles in space and time to the beat of some song. Many beatmaps are designed to build the novice player's skills, and yet many more are crafted to challenge even the most dexterous, rhythmically inclined Osu veterans. Because Osu is completely free of charge to download and play, Osu's entire ecosystem of content consists of thousands of beatmaps created by the Osu community. Osu ships with a beatmap editor, and anyone can create their own beatmap to the song of their choice and share it for others to enjoy.

Creating a beatmap a tedious—but rewarding—task. It is not something easily done by someone who has not played a variety of songs on Osu, because it requires understanding the community's mapping conventions and trends to make a beatmap that is challenging, readable, and fun. Naturally, the more complex the song, the harder it is to map. As a result, the songs behind most beatmaps are chosen to have a constant tempo to simplify mapping and enhance readability. Classical music, with its frequently variable tempos, is thus a largely untapped genre.

That is where this project enters: Out of my love for orchestral music and Osu, I have dedicated this remote learning assignment to mapping Gustav Holst's *Jupiter, the Bringer of Jollity*. Two long nights have yielded a result that I am thrilled to premiere. I intend to further polish the map and submit it for inclusion in the Osu repertoire. It is my hope that Jupiter is incorporated into a beatmap pack and introduces hundreds of thousands of players to the deep expression and, indeed, jollity of classical music.

The reader can watch the video of my recorded performance here and jump to referenced sections by clicking the timestamps in the discussion to follow.

Osu Gameplay Mechanics

The only objective of Osu is to click the objects on the screen at exactly the right time. These objects come in three different varieties:

1. Circles
2. Sliders
3. Spinners

Circles are the simplest object. They require a single click to perform. The player knows when to click the circle based on a faint outer ring called the *approach circle* that closes in on the edge of the inner circle. Circles are naturally used to express staccato notes. To represent fast rhythms, circles can be chained together in quick succession to form a *stream*. Such rhythms are difficult to perform with the mouse buttons, and it is for this reason that most players click by alternating between two keyboard buttons with the second hand instead of clicking the mouse buttons.

Sliders consist of a start point and an end point connected by a curve. To perform a slider, the player must click the start point and maintain mouse contact with the tracking circle moving along the curve to the end point. Each slider moves at a constant speed, but some sliders can be faster or slower than others. Some sliders have *reverse arrows* that cause the tracking circle to continue in the opposite direction when it reaches the end point. Sliders can have multiple reverse arrows. From a mapping standpoint, sliders have immense expressive power and can represent a variety of note articulations, including tenuto notes, held notes, and marcato notes.

Spinners challenge the player to drag the cursor around the center of the screen as fast as possible. Each spinner has a threshold number of rotations that the player must perform in order to complete the spinner. Spinners are most frequently used to represent crescendos and decrescendos that occur over multiple measures.

Challenges

As mentioned in the introduction, mapping classical music presents unique challenges for map creators. The top three are as follows:

1. Variable tempo
2. Complex rhythms and readability
3. Slow sections

Variable Tempo

Before creating a map, a mapper must create a *timing*—that is, a mapping of beats in the song to timestamps. For songs that have a constant tempo, timing is as simple as setting a single *timing point* containing the time signature, tempo, and offset for the first beat. For classical works like *Jupiter*, however, the timing process is extremely tedious: My map for *Jupiter* has 268 individual timing points, each of which captures any degree of variation in tempo. Even tempo changes as little as 1 BPM must be accounted for, because every beat must be mapped as precisely as possible.

Frequently varying tempo also makes it more difficult to create a map that is readable. Players rely on heuristics like subdivision to sight-read maps quickly. At points where sections play rhythms faster or

slower than the average orchestra tempo, the creator of the map must compromise to resolve the conflict in a readable way.

There are two approaches I take. One option is to time the "important" beats (the beats that the mapper intends to be represented as objects) exactly as performed. When doing this, it is important not to rely too much on streams (sequences of circles). Instead, the mapper should prefer using sliders such that the start points convey downbeats and end points convey the upbeats. The *hit sound* (the sound the game generates when an object is clicked) upon the slider reaching the end point telegraphs the change in tempo to the player. An example of this is at 0:06, when the 16th-note melody is faster than expected.

Another option is to time the average tempo over a measure and let the player fully rely on subdivision, even though the objects' hit sounds will not perfectly line up with the audio rhythm as performed. This approach is necessary when the map creator would like to use quick successions of circles. A demonstration of this can be found at 2:09, when the third red circle is ever so slightly off from the flute note.

Complex Rhythms and Readability

The often-complex rhythms of classical pieces make for fun maps, but there is a fine line between a challengingly fun map and a frustrating map, and it almost always comes down to readability. There are many ways to map rhythms, but there are some important mapping conventions that enhance readability when followed.

One tenet of mapping is not to *overmap*, or map objects to every imaginable sound. Orchestral works are filled with countermelodies and accompaniment rhythms that complement the melody, and it is sometimes hard to choose what to map, but it is important to choose one line at a time. In most cases, I map the melody, but occasionally the accompaniment stands out enough to be mapped. An example of this in *Jupiter* is the accompaniment at 6:01. Another example is the switch from the melody to the impactful accompaniment at 4:28, which produces an especially powerful effect.

Many times, a single rhythm is so unexpected or complex that it deserves special care. There are conventions that the Osu mapping community has adopted over the years to map these rhythms. One such convention is the use of color. Colors are most often used to denote musical phrases, but they can also be used to enhance readability. A mapping trend is to color all the notes in unexpected triplets as different colors, a demonstration of which can be found at 2:22. It is also important to note that the triplet theme of this section was first communicated to the player at 1:47 in the form of sliders with reverse arrows, which are easy for players to read and perform. This hint to the player allows the map creator to use circles to map the triplets later in the piece. A particularly troublesome rhythm, which I had to refer to the score to decipher, was the triplet followed by eighth notes at 5:20.

Slow Sections

Slow, lyrical sections like the andante maestoso section of *Jupiter* (see 3:06) are usually easy to read, but they have the potential to bore the player when not mapped properly. These sections are always slider-heavy, and to make the section interesting, a map creator must use varying slider shapes and speeds. Slider speed should reflect the intensity of the music; lower intensity requires slower sliders, and higher intensity requires faster sliders. Because these sections are easy to read, it is okay to vary the slider

speed every beat if that best conveys the emotion. The main burden on the mapper is the tediousness of arranging sliders in a beautiful and expressive way.

Circles and Sliders as Choreography

Ever since I began playing Osu, I have likened the art of mapping to choreography. In both choreography, motion is the language used to express music. Mapping is no different.

I use several tactics to translate the emotion of music into the language of circles and sliders. One tactic is to place more or less space between circles as the intensity of the music increases or decreases, respectively. At 0:35, I place ample space between circles to convey the large intervals in the melody. At 0:58, the circles begin close to each other but spread away as the intensity grows.

Another tactic that was previously mentioned (but deserves more examples) is to vary the slider speed with intensity. A quintessential example is the fast section at 2:16. Slower sliders can represent both low-intensity legato rhythms (3:06) and high-intensity held notes (2:40 and the red slider at 7:48).

Finally, a piece of music is defined by its themes, and a beatmap must reflect that. There are numerous examples of themes that reappear throughout *Jupiter*, and I take care to translate those into themes of motion as well (though, when the musical theme is written, I feel as if the motions choreograph themselves). For examples: 1:59 and 6:40, 0:58 and 1:37 and 6:36.

Conclusion

There is much more to say about mapping in Osu, to say nothing of the many other genres that have their own quirks and trendy styles. The most important thing that I've learned is that, even though classical music is underrepresented in the Osu community, creating exciting maps for classical music is possible, and I hope to create many more in the future.