Thesis: concept paper

The humble goal of this project is to integrate music into gameplay in a new way, transforming the music staff into a living environment to be explored and played with, and transforming the player--who may or may not possess prior musical knowledge--into a composer. The player should leave the game with a changed perspective on sheet music and some understanding of basic musical principles. This is not an “educational” game.

There are many games, primarily digital ones, that tie gameplay to music. Most focus on rhythm and timing, which people are more likely to understand than they are pitch. These games typically have an element of mimicry as well. For instance, in *Guitar Hero* the player becomes a rock star, standing on stage in front of a screaming crowd and performing a selection of established and familiar hit songs. The player “plays” these songs by pressing certain buttons at the correct moment in time with a scrolling “fretboard” on screen. While it is possible to play *Guitar Hero* with a regular gamepad, the game is best experienced with the included “guitar,” a plastic controller shaped and designed like a reduced-scale guitar. The buttons are situated such that, when playing the game, the player must press certain buttons on the neck of the guitar with one hand and “strum” another button on the body with the other hand. The combined effect simulates the experience of playing a real guitar--albeit in a greatly-simplified fashion--and the correlation between the (also simplified) note patterns on-screen and the actual progression of the song furthers the illusion that the player really is generating the music.

The overall effect is very compelling and certainly makes the feeling of guitar playing more accessible to people who might not learn the real instrument. Other such games may not use a special controller but do also provide a satisfying feeling of being “in the music” by requiring accurate timing for the button presses and taps. Still, underneath the illusion these

games are not really about the music. They are a chance to listen to real music, yes, and doing so helps the timing of playing the game, but the music is not *integral*, and it is possible to play the game with the sound off (though it is difficult and not very satisfying). Furthermore, it is debatable whether this experience translates into any new understanding or other increase in "musicianship" (for instance playing *Guitar Hero* at a high level does not mean one can play the real guitar even at a low level). There are some games that do try to go further, allowing the player to generate the soundtrack through play or even giving the player direct compositional powers, although most such software verges either into the realm of toys/tools (i.e. not really a game) or educational games (i.e. typically not very accessible or fun, sadly). But there has not been much in the way of a game that makes music, in its full sense, the focus of play.

The risks of doing so are apparent. People play games for enjoyment; a game that purports to teach usually scares off players, who want to relax, not attend school. A game that embraces music theory, with melody and harmony and pitch and key and tempo and all the richness of music beyond "mere" rhythm, seems doomed to alienate the many people who don't have interest in this material, or the ear for it, or both. A pitch-driven game would just be meaningless sound effects to someone who is tone-deaf, for example. Perhaps it is no wonder that the genre of "music games" has not advanced further.

However, there is an aspect of music that has not been much explored for its potential application to games, and that is its spatial, mathematical nature. Notes are "higher" or "lower" than other notes, and have specific mathematical relationships between the frequencies (i.e. pitches). Chords are notes "stacked on top of one another." Notes in sequence may be thought of as arranged horizontally, separated by spaces representing time. Sheet music is very illustrative of this point. While someone without training may not be able to make sense of the symbols on the page, it should at least be evident that there is a spatial system in place, in which

the vertical and horizontal position of the marks have significance. Admittedly, this is an abstraction, or a metaphor. Sound waves with a greater frequency produce “higher” notes, but do not actually travel through “higher” air than do low notes, like planes at different elevations. Still, as a system for considering the relationships between notes in a musical score (without having to consider the technical details of frequency and so on), the spatial representation of sheet music is extremely useful.

There is a corresponding representation to be found in musical instruments as well. The keys of the piano are separated spatially, such that to play a big chord requires spreading the hand a great distance, and anyone who plays a string instrument may see how shortening the length of the vibrating string raises the pitch (this may be the least metaphorical spatialization). Still, the musical score (i.e. the staves on the sheet) function in a special way as something that may be “read” for those in the know but may also be comprehended in a spatial way even by those who cannot translate the marks to an instrument. In a sense, the music “moves” through the “world” of the staff, leaping up to higher notes, plummeting to the lower registers, graphed in stasis against the x-axis of time. The score is the time-lapse recording of a traversal through musical space.

Now consider a videogame such as *Super Mario Bros.*, in which the player moves Mario through a 2D, side-scrolling environment, jumping over and ducking under hazards while collecting and interacting with the elements of the fantastic world. This, too, is a traversal through two-dimensional space, and a time-lapse recording of Mario’s movement through an entire level (requiring almost as much verticality as horizontality) might bear some resemblance to a musical score. The intention of this project is to complete that analogy by turning the 2D “environment” of the musical staff into an actual side-scrolling world for the player to explore, in which notes become objects (and objects notes), manifested in a tangible way, “scored” in the

vertical axis according to their associated pitch, moving toward the player and generating the music and sounds of the world through their interactions. For example a bird might fly along one line of the staff, humming its note, while a frog jumps through a melodic progression (up and down a few notes). Meanwhile special boss enemies might attack the player with more complex "riffs," for instance shooting a series of fireballs at the player, scored (and thereby spatialized) in a melodic way and requiring greater skill and dexterity to conquer.

The player, in the role of the composer, is not locked to the staff but has the special power of interacting with the notes in different ways and using this ability to navigate the environment safely. Each level would present different variations of the core mechanic (musical interaction), in the manner of game designs such as *Braid* and *VVVVVV*. For instance, in the first level the player might have to "record" notes or progressions--achieved by navigating to the required note and pressing the Action button--and then play them back, while in another level the player could latch onto notes in the environment and drag them around, thereby changing the timing (horizontal movement) or the pitch (vertical movement). Other levels might explore aspects such as repetition and harmony.

The success of the project hinges upon the spatialization of these elements. The notes generate a pitch appropriate to their position on the staff, so by manipulating them the player generates the audio, but *comprehending* the audio is not itself necessary to succeed. A musician could identify the sound of a perfect fourth interval, but someone who is tone deaf can still *see* that notes arranged in a vertical formation at a certain distance satisfy the requirement (indicated through other forms of feedback); thus they may learn what a fourth looks like on the staff, even if the *sound* does not increase its significance. Pitch, melody, chords, rhythm and timing, repetition--all these elements of composition can be understood in a visual manner through their spatial representation on the staff, and thus understood through play by their

manipulation in the game world context. This context brings the additional advantage of familiarity. Reading and (in a sense) “writing” sheet music may be alien territory for some players but most people are familiar with the *Mario*-esque concept of running and jumping through a two-dimensional space, so the manifestation of the former through the “skin” of the latter makes the experience immediately mentally accessible. Furthermore, since the interactions are all based around the physical manipulation of tangible objects, the act of composing becomes a familiar (and very game-appropriate) activity.

It is important to stress the direction of approach in this project. It is about a new convergence of music and gameplay, the actualization of composition as a gameplay mechanic, *one that results in an enjoyable game*. It is not about educating the player in music theory, though that may happen as a consequence. The difference being stressed is that between an engaging work of history and a stereotypical textbook. The sole reason the textbook exists is “to teach history,” which in practice means dry facts, boring anecdotes and miserable students. Readers of Herodotus’ Histories, on the other hand, inevitably learn about Greek history (which, admittedly, is fascinating) but they do so through a gripping narrative. Herodotus tells a great story that happens to be historically-based, with the result that the enthralled readers happen to acquire some knowledge. Just so, this thesis project aims to present a great gameplay experience that happens to be based in musical composition, thereby expanding the medium and increasing players’ understanding of the source material.