

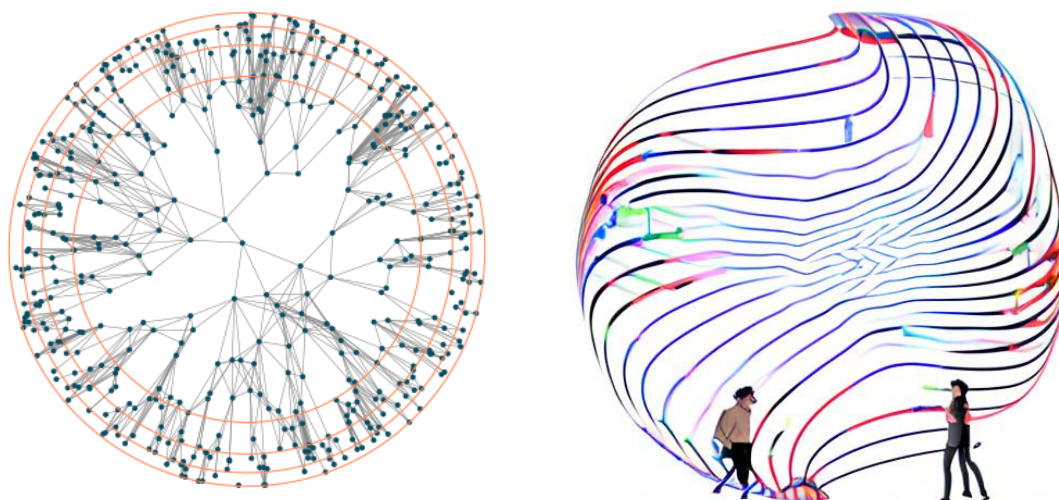
Hyperbolic Music / Sound

Hyperbolic space is a geometric space that has a negative curvature, meaning that it has properties that are different from those of Euclidean space. It is not possible to physically listen to music in hyperbolic space as it is a mathematical concept and not a physical space. Hyperbolic music can be listened to in the same way as any other music, by playing it through a speaker or headphones.

Despite its name, hyperbolic space is not a very good way to listen to music: It has a very high ratio of acceleration to the speed of sound, and therefore low quality low frequency response, which is a defining characteristic of 'braidy' music.

I first stumbled across this type of music whilst studying at the University of Reading in 2008, where I came across a lecture by Professor Geof Davis entitled The Extreme Dynamic of Space. In his lecture, he outlined a paper he had written with Mark Beeman, titled Dynamic Electric Acoustic Resonance. In the paper, the authors claimed that this type of music has an extreme change in frequency which means that it can only be heard in the 0.5 Hz to 10.0 Hz range. They further claimed that the 'best' place to listen to this type of music was in a hyperbolic plane (in this case on a Zeppelin that flew over the North Pole and in an enclosed space).

<https://everynoise.com/>



What is hyperbolic music?

Hyperbolic music refers to a style of music that uses complex rhythms and harmonies to create a sense of movement and tension. It often incorporates elements of dissonance and atonality, and may also make use of unconventional time signatures and syncopation. This style of music is often associated with modern classical, experimental and avant-garde music. It is not a widely recognized genre and can be hard to find examples of it.

<https://aclanthology.org/2020.nlp4musa-1.8.pdf>

How to make hyperbolic music?

There are many different ways to create hyperbolic music, as it is a style rather than a specific genre. Some techniques that can be used include:

- **Complex rhythms:** Incorporate unusual time signatures or use syncopation to create a sense of movement and tension.
- **Dissonant harmonies:** Use dissonant chords or atonal melodies to create a sense of tension and dissonance.
- **Extended techniques:** Experiment with unconventional playing techniques, such as using unconventional instruments or electronic manipulation of sounds.
- **Chance operations:** Incorporate elements of chance, such as using random processes or algorithms to generate melodies or rhythms.
- **Spatialization:** Use techniques such as stereo panning or reverb to create a sense of space and movement in the music.

It's important to note that it's not a rule that you need to follow all these techniques, you can pick and choose what you want to incorporate in your music.

It's also worth noting that the most important thing when making music is to experiment and try different things. Don't be afraid to break the rules and try new things!

How to listen to hyperbolic music in hyperbolic space?

Hyperbolic space is a geometric space that has a negative curvature, meaning that it has properties that are different from those of Euclidean space. It is not possible to physically listen to music in hyperbolic space as it is a mathematical concept and not a physical space. Hyperbolic music can be listened to in the same way as any other music, by playing it through a speaker or headphones.

That being said, in some cases, some composers and sound artists have tried to use hyperbolic geometry as a metaphor to explore new ways of composing and listening to music. Some have used hyperbolic geometry to model the structure of sound, or to create visualizations that can help to understand the structure of a piece of music. These kind of works are usually experimental, and can be hard to find, but if you are interested in exploring this concept more, searching for "hyperbolic music" or "hyperbolic sound" online might give you some leads.

how to listen to hyperbolic music in spherical space?

Spherical space, like hyperbolic space, is a mathematical concept and not a physical space, so it is not possible to listen to music in spherical space in the literal sense. However, similar to hyperbolic space, spherical space can be used as a metaphor or a model to explore new ways of composing and listening to music.

In audio processing, spherical harmonics are a mathematical tool used to represent sound fields in a spherical domain, and this technique can be used for different applications such as spatial audio, sound design, and music composition. Some composers and sound artists have used spherical harmonics to create immersive audio experiences, such as binaural soundscapes, by simulating sound sources in different positions around the listener.

Additionally, some composers have used virtual reality (VR) technology, which allows users to explore virtual environments in a spherical space, as a way to create immersive and interactive musical experiences.

In summary, spherical space can be used as a metaphor or model for new ways of composing, listening and experiencing music, but it is not a physical space, and it's not possible to listen to music in it.

how to listen to hyperbolic music in physical space?

Hyperbolic music, like any other style of music, can be listened to in physical space by playing it through speakers or headphones. It can be enjoyed in different environments such as concert halls, clubs, and even personal listening spaces.

One way to listen to hyperbolic music in a physical space is by attending a live performance. Many experimental and avant-garde music ensembles and orchestras perform works that incorporate elements of dissonance, atonality, and complex rhythms that can be classified as hyperbolic music.

Another way to listen to hyperbolic music in physical space is by using surround sound speakers. This allows the listener to experience the music in a more immersive way by placing the speakers around the listener to create a sense of movement and tension in the music.

Additionally, some composers and sound artists create installations and pieces that incorporate hyperbolic music and spatialization, where the music is played in different spaces and environments, creating a unique listening experience.

how to listen to hyperbolic music in cyberspace?

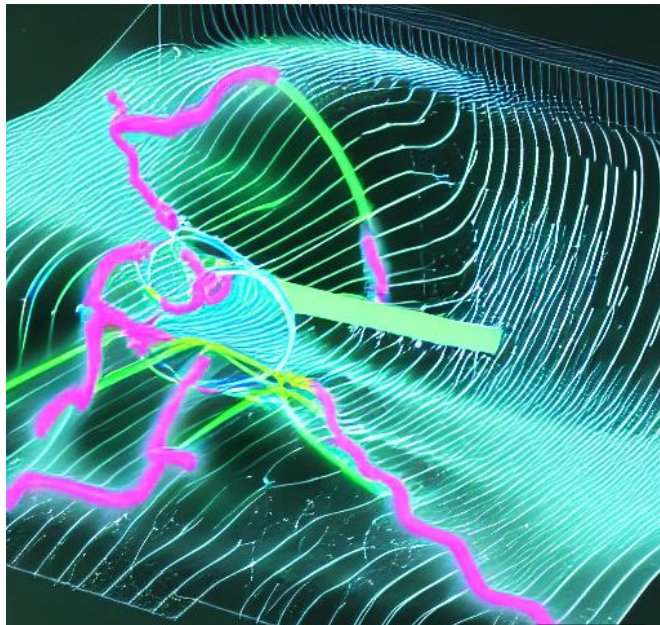
Listening to hyperbolic music in "cyberspace" can refer to a few different things, depending on the context.

One way to listen to hyperbolic music in "cyberspace" is by streaming or downloading the music online. There are many platforms such as Spotify, Bandcamp, and Soundcloud that provide access to a wide variety of music, including experimental and avant-garde music that might be considered hyperbolic.

Another way to listen to hyperbolic music in "cyberspace" is by experiencing it in a virtual reality or augmented reality environment. Some composers and sound artists create immersive and interactive musical experiences using VR and AR technology, and this can be accessed through a VR headset or a smartphone app.

Additionally, some composers and sound artists create generative music, meaning that the music is generated by an algorithm, and these pieces can be experienced online in a web-based platform.

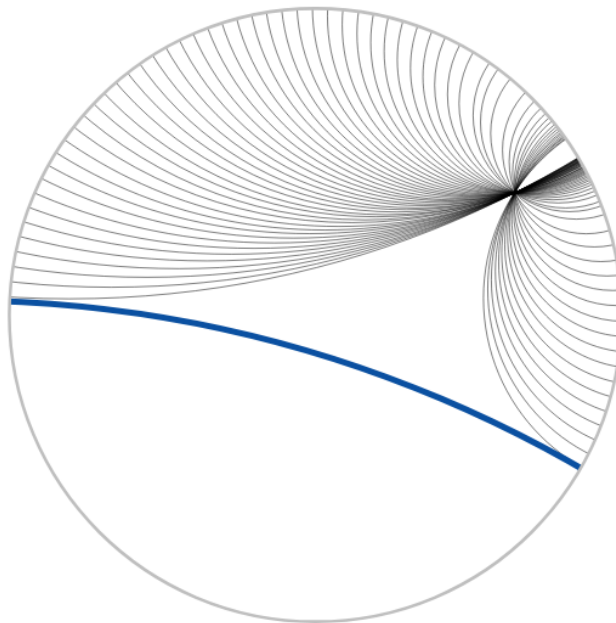
In summary, "cyberspace" in this context can refer to the online world, where you can find and listen to hyperbolic music through streaming platforms, virtual reality and augmented reality experiences, and online generative music.



<https://everynoise.com/EverynoiseIntro.pdf>

“You might also get a sense, perhaps more vividly than before encountering our map, of the contours of the overall space of musical possibility.”

“Maps are, after all, as much machines for getting lost as they are for finding yourself. There are probably things on this map you’ve never imagined. It probably contains things that you don’t yet realize you love, and branching points where you will be amazed and thrilled to have veered.”



HyperE: Hyperbolic Embeddings for Entities

<https://hazyresearch.stanford.edu/hyperE/>