

The Indian Roots Of Generative music

Quick Intro

- My name is George.
- In the final year of my design degree at Srishti Bangalore, where I explored the world of New Media
- Previously an assistant researcher at the Indian Sonic Research Organisation for a year where I explored sound art and Neurotechnology
- Hats I like to wear: New Media artist, Creative technologist, Computational designer etc (as a humble amateur, of course)
- Currently a part-time Haptic Design Technologist for Compossible Umwelten in Mumbai, where I help with Neuro-Haptics for tactile devices

An open-ended question

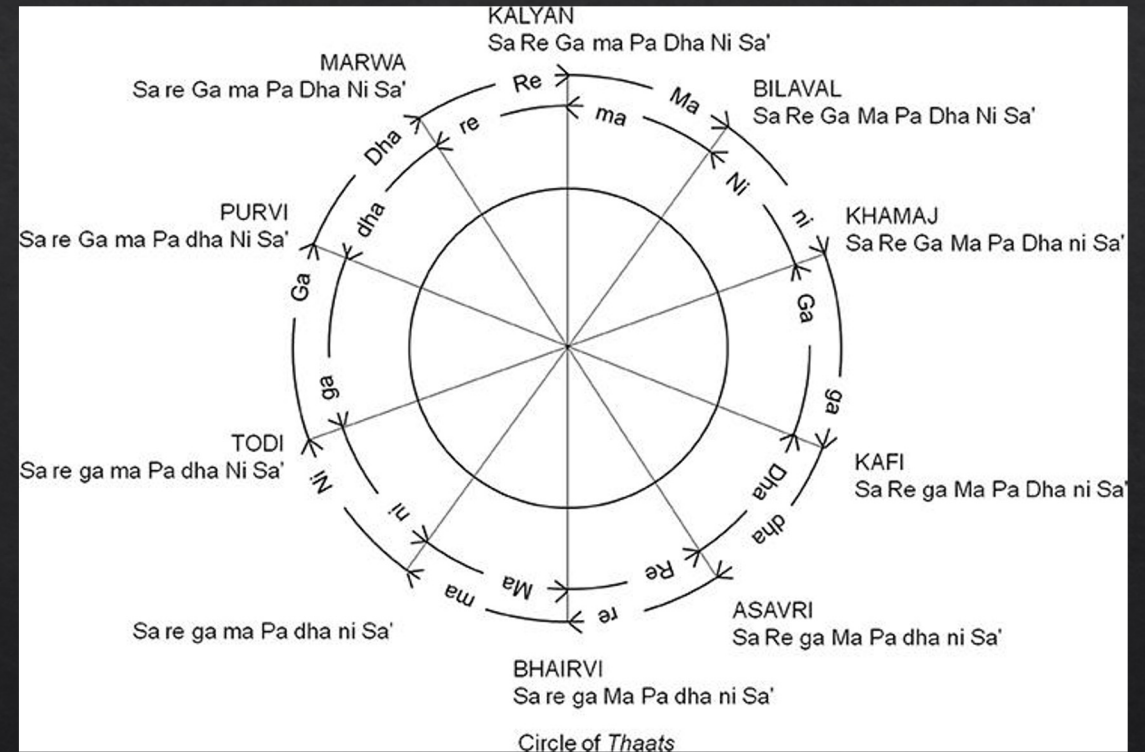
Is there some validity to the idea that generative music (such as livecoding, modular synthesis, audiovisual sequencing, spatial music) has more potential if we try an Indian approach versus a western one?

If so, why re-invent the Wheel?

Disclaimer(s):

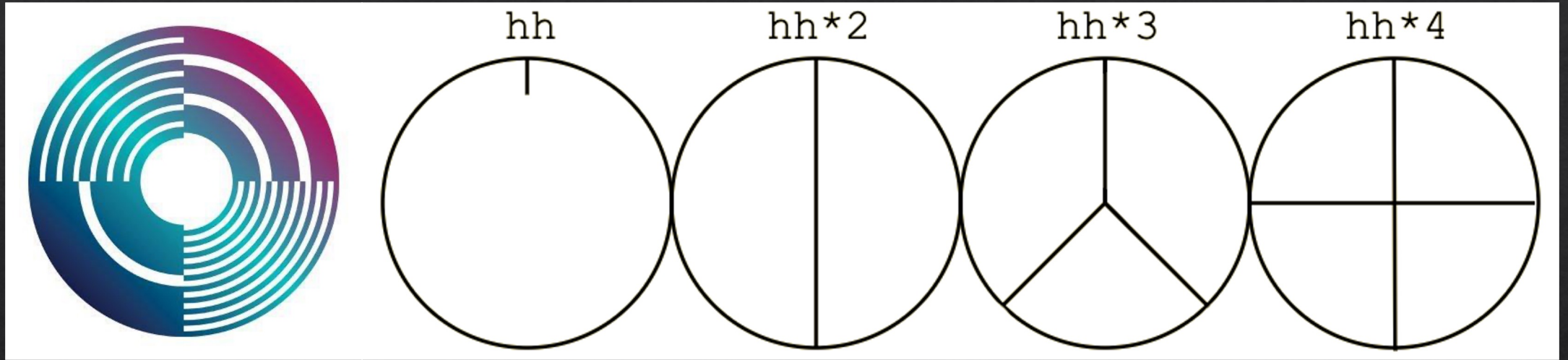
This topic is still a (lot of)
work in progress!

1. Cyclic improvisation



Western “bar” Time vs Indian “tala” Time

- *Tala's* reincarnation-like cyclic time has Indian Musicians play across the *Raaga* framework, unlike most Western music where notes are read from the left to right.
- This allows the Indian raga to go as long as the musician wills it. Technically, a *Raaga* can go on infinitely.
- Till now, Indian musicians played improvisationally 'on-the-fly' from their memory until the *Raaga* tired them out
- Computer algorithms, with their ability to infinitely repeat a command and the ability to generate and store arrays, now open new doors for *Raaga's* potential



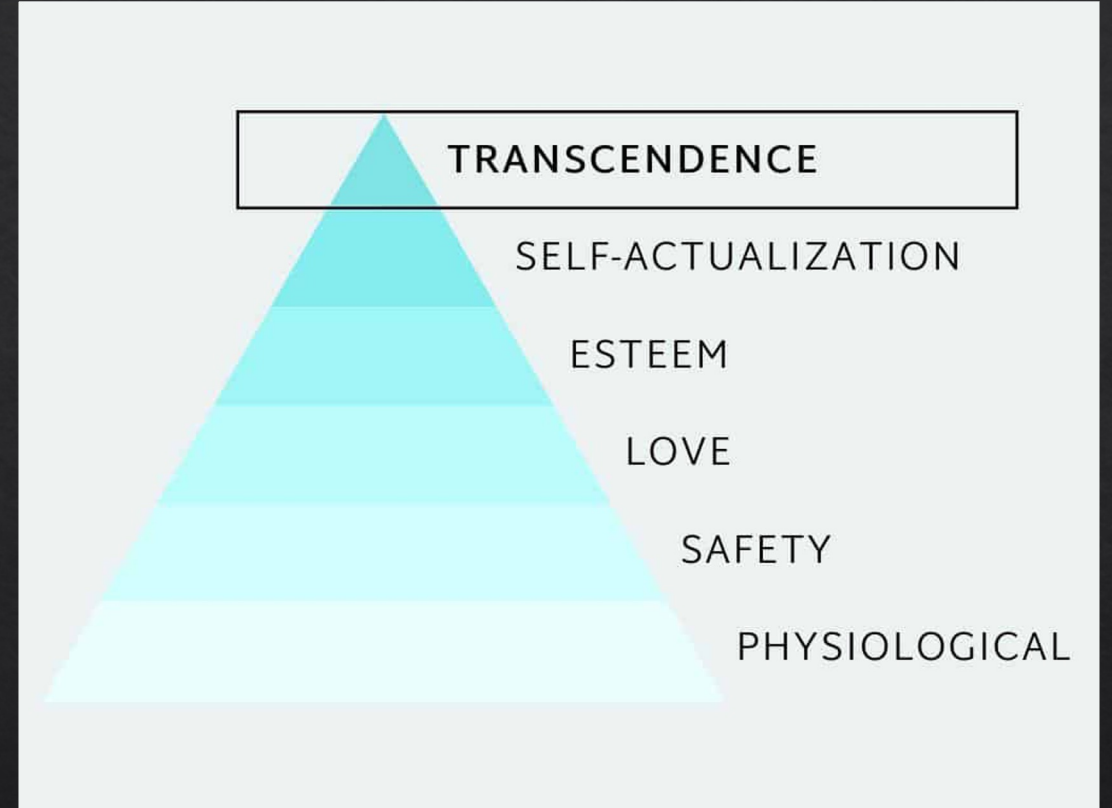
TidalCycles, a Haskell based musical coding language, allows for realtime improvisational music creation via a similar cycle based timing structure, allowing for new ‘reincarnation-like’ rhythmic forms

2. Spatial transcendence



The *Sabda*, the original sound that created the universe. Pic from
Hands music video by William Arcane

- Indian classical music is traditionally meant to recreate a *Dhwani Mandala*, roughly translating to “phonosphere” or soundscape
- The purpose of art is not personal expression but to ensnare the spectator into a virtual state of deep emotional bliss (the sublime) for *moksha* (Transcendence)
- The resonant ambient drone in the *Sitar* as well as a separate instrument altogether (Tanpura) serves as the spatial “ground” of Indian music
- Immersive media has the potential to bring the final apex of Maslow’s hierarchy of needs, self-transcendence, through its potential for the *sublime*, according to New Media theorists like Joseph Nechvatal and Roy Ascott
- *This approach has a lot of potential when we think of spatial music in VR*



*Left: The Las Vegas Sphere, a perfect example of Visual Sublime.
Right: Maslow's 'complete' hierarchy before his death*



Compose music with a powerful suite of audio devices

In-game purchase required. Non-gameplay footage included. Gameplay Not Final.

*Modular Synthesis in Fortnite via Unreal engine's
Quartz and MetaSounds tools*

3. Discovery

```
(t>>7|t*4|t>>4|t>>t|t  
*t/64)&(t>>6|t*4|t>>2|  
t>>t|t*t/64)|t>>5
```

ByteBeats are small, one line musical waveform equations written in C describing a wave formula in terms of time T. Entire songs are played as a result

This example was “discovered” by user BonesYT

“A Bytebeat formula is a simple arrangement of digital-arithmetic operations that have been elementary to computers since the very beginning. It is apparently something that should have been discovered decades ago, but it wasn’t.

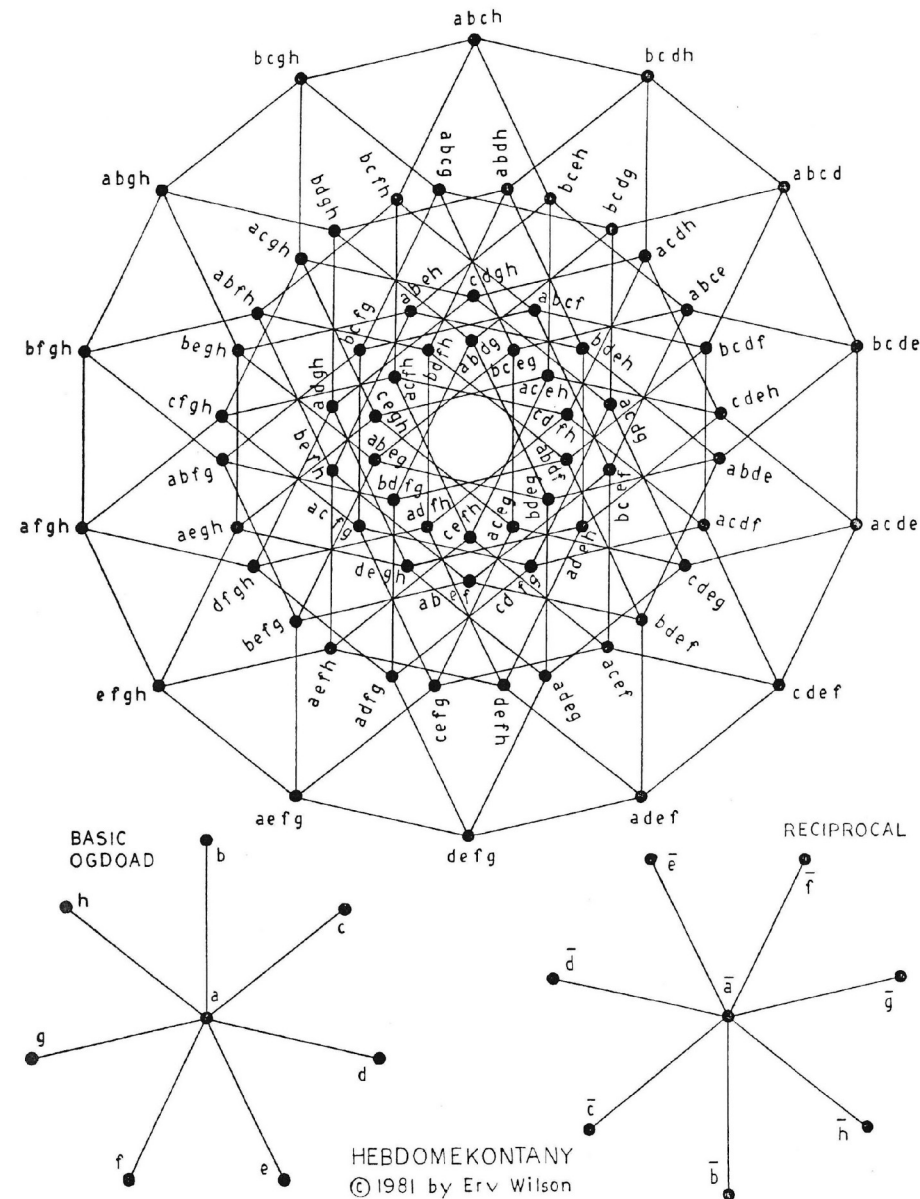
It is mind-boggling to think that the space of very short programs remains so uncharted that random excursions there can churn out new interesting structures even after seventy years.”

—Viznut, the “discoverer of bytebeats”

- Interestingly, *Raaga*'s are not created, but similarly said to be discovered
- There's posited to be an infinite amount of *Raagas* that an Indian musician could possibly discover and use for specific timings and occasions
- This is a common thread to all forms of Indian art, where the artist "finds" the art in the space of combinatorial possibilities of his own imagination.
- This (probably) comes from how the Hindu philosophers thought about Cosmology/Metaphysics

Right: Erv Wilson's
Hebdomekontany formula to
generate tuning systems
outside standard 12-tone.

Wilson was significantly
influenced by *Raaga* and South
Indian Carnatic and even
named an algorithm "Mount
Meru"





Wilson holding up a 3d sculptural representation of his 4d microtonal tuning scale (Source: *Surfing the Sonic Sky*)

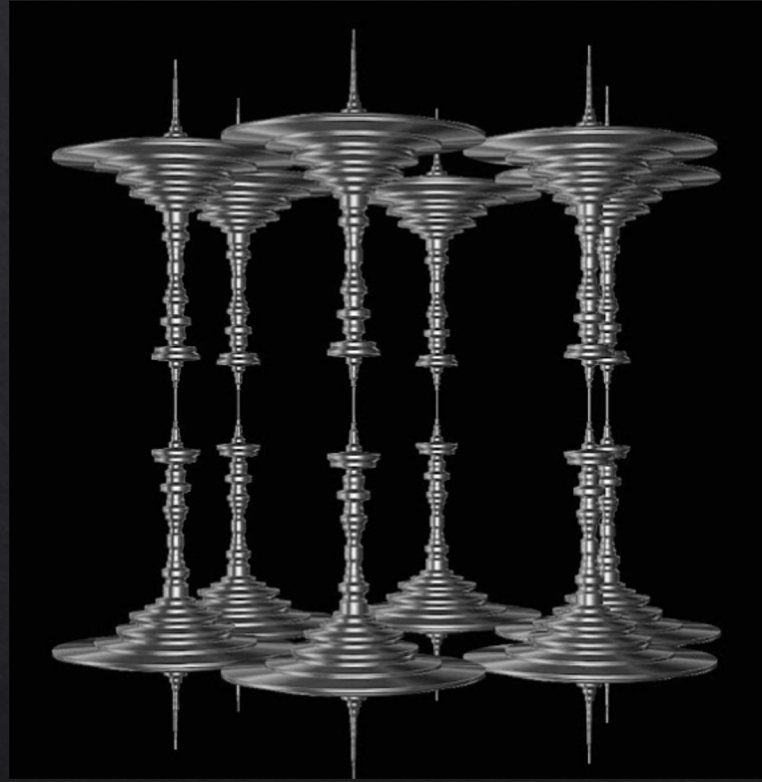
Bonus section: Generative rhythms



The ancient Poet Pingala's prosody work in the '*Chandas Sastra*' outlines a method to produce Generative rhythms.

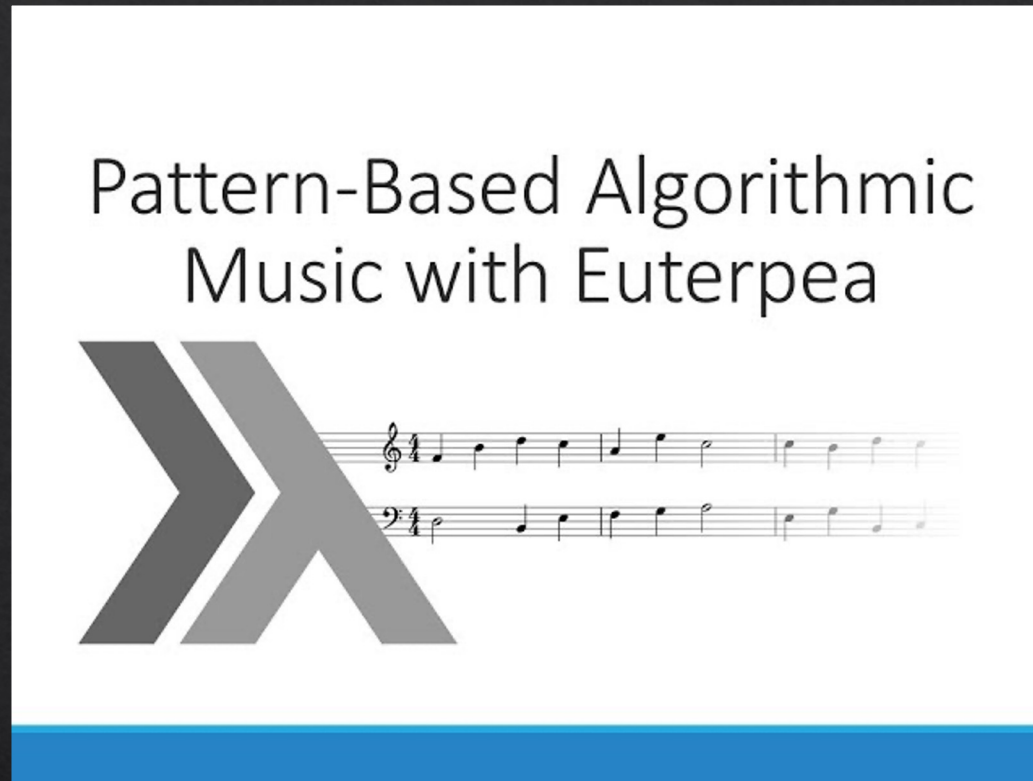
It structured as a binary method to classify syllables in poetry via binary combinatorics, which is analogous to computational approaches today

Archi-music



Left: Dubious Facebook post outlining “soundwave pillars” in Hindu Temples
Center: Actual audio waveform to 3d implementation in Touchdesigner
Right: Musical pillars of Vittala Temple, Hampi, Karnataka

Fractal-music



Self-similarity and Fractals are a common thread in Indian art and philosophy, due to the *Samkhyas* positing a holonomic universe that fractalizes at every level.

More obscure computer music languages, like the Haskell based *Euterpea* by Paul Hudak, actually outline methods to create self similar melodies in their environment.

Fin.

(And hope this has been somewhat convincing, because there's potentially a lot more to still explore)