

Music and AI Problematics

Interface Design and the Current Lack of Musical Correlates

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Presentation Outline

- Disconnect between current AI interface designs
- H. Stith Bennett referred to as the historical framework of “music’s technical features” (Bennett, 1983, p.216)
- Technical features can be considered as forms of language and communication, like notation, musical terms, compositional styles, dominant instruments, embodied musical performances and techniques
- Conversely, AI systems, like Suno and Udio, introduce new technical elements that rely primarily on the recorded work, which has a shorter history (Boon, 2022a; Boon, 2023)

Introduction

- YACHT – labour intensive converting material to MIDI to be ingestible (Matise, 2019; Valenzuela, 2020)
- Problem - access to Magenta mediated and proscribed by Google's engineers, album took three years to complete
- Similar problems noted when observing teams of musicians and engineers working on the AI Song Contest, with engineers mediating interactions with the machine (Huang et al., 2020)
- Large amounts of material produced in a number of minutes means musicians adopt a “generate then curate” approach (Deruty et al., 2022)
- Engineers coded additional rank and sort algorithms to cope with number of outputs (Huang et al., 2020)

Huang et al., (2020) - Observations

Cause

- AI was **not easily decomposable**
- was **not context-aware**
- **not easily steerable**

Effect

- not easy to tweak individual musical components
- not fully aware of the musical context it was generating for
- not easy to request for the music to bear a certain mood or effect

The Homeostat in AI

- limits of functional interface between human musicians and Magenta
- Google's engineers function as vital part of the machine's interface
- Refine and condition information flow to the machine but leave human musicians with raw unconditioned outputs to deal with
- Google's engineers act in a manner similar to Ashby's homeostatic engineer (Ashby, 1960)
- Engineers there for the company and the machine, not for the human, with the express purpose of ensuring stable working conditions

The Homeostat in AI - Reverse Lo-Fi Anime Girl

In the game, players must keep generating music that helps the on-screen anime character stay focused on studying. To do so, you continuously catch falling text prompts and feed them into the AI music generator.

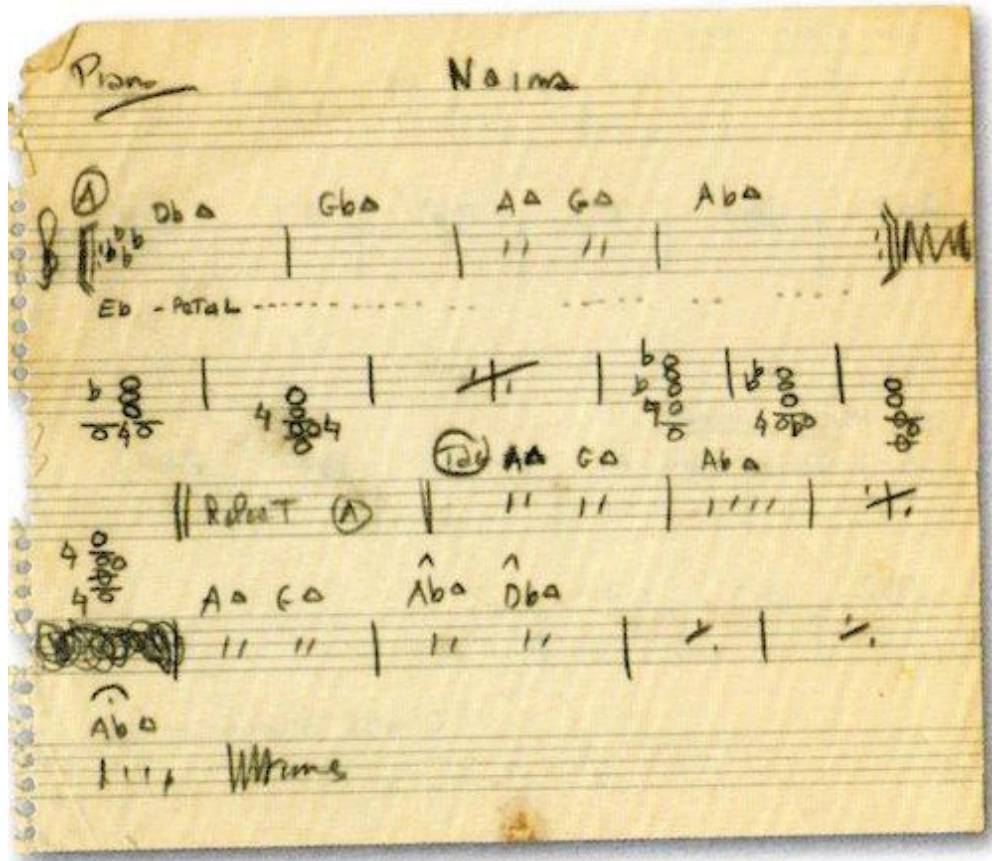


Game screen

If the music becomes too relaxed, the character falls asleep. If it gets too danceable, she stops studying and starts dancing. The key is to maintain just the right mood and energy by choosing the most appropriate text prompts. (Qosmo, n.d.).

- Homeostat is foundational to early Cybernetics
- Qosmo implements a gameified approach, using Magenta, to elicit pre-selected prompts from humans to achieve stasis
- the user is Ashby's homeostatic engineer
- Despite the desire to produce new things, homeostatic ideas cannot easily be escaped in AI music applications
- Homeostasis is less useful in artistic domains if the intention is to create radical or new music

Music's Historical Technical Features



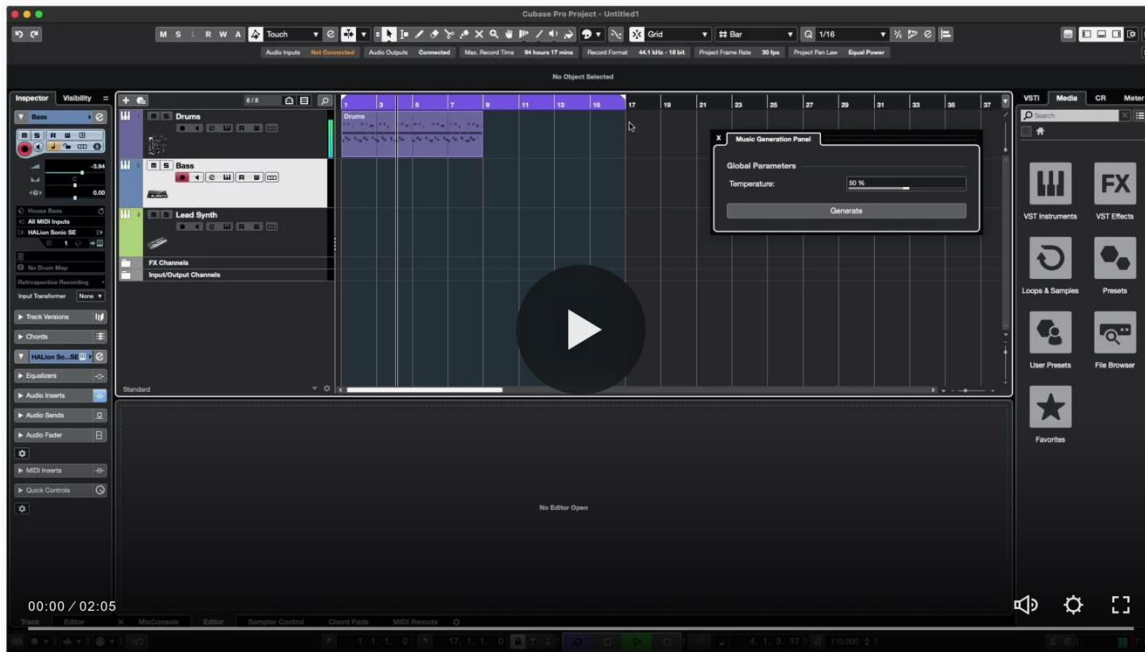
Spitzer, 2015

Coltrane's score directions for his band members.
First use of DELTA (Δ) symbol introduced into music notation to symbolise a major seventh chord.



John Coltrane, 2020

Interface Disconnection - Contrasted



Tchemeube et al., 2021

Temperature selected because it “has been the most extensively used and the most commonly found parameter among modern generative music systems” (Tchemeube et al., 2021, p.5771)



Eventide, 2026

Music Mouse, from 1987, controls up to four voices of musical data in parallel or contrapuntally with up to 1152 possible structural patterns based on combinations such as transposition, harmony types, scale centres and symmetry types.

Black Boxes and the Difficulty of Creativity for AI

- Presence of a research team to provide an additional interfacing mechanism to assist and bridge the gap
- Temperature, as a parameter control, evidence of a Black Box (Seaver, 2019)
- Bringsjord highlights that LLM/GenAI removes from programmers the “burden of having to express a problem and a solution to a problem in precise terms” (Bringsjord, 2022).
- Refers to this as a dead end, which produces the magic.
- Russell and Norvig, despite claiming AI “is concerned with not just understanding but also building intelligent entities” (Russell and Norvig, 2021, p.19). Any study of creativity is absent from their text.

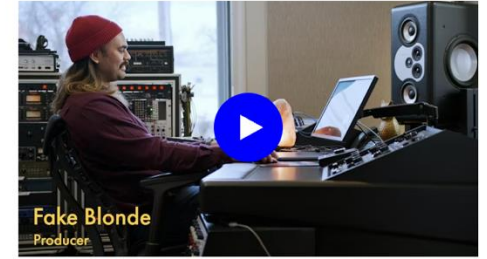
Black Boxes and the Difficulty of Creativity for AI



Gated noise



Subtractive sampling



Chopping with chance



Exploring structures



Taking turns



Record first



Escaping habits



Sonic notes

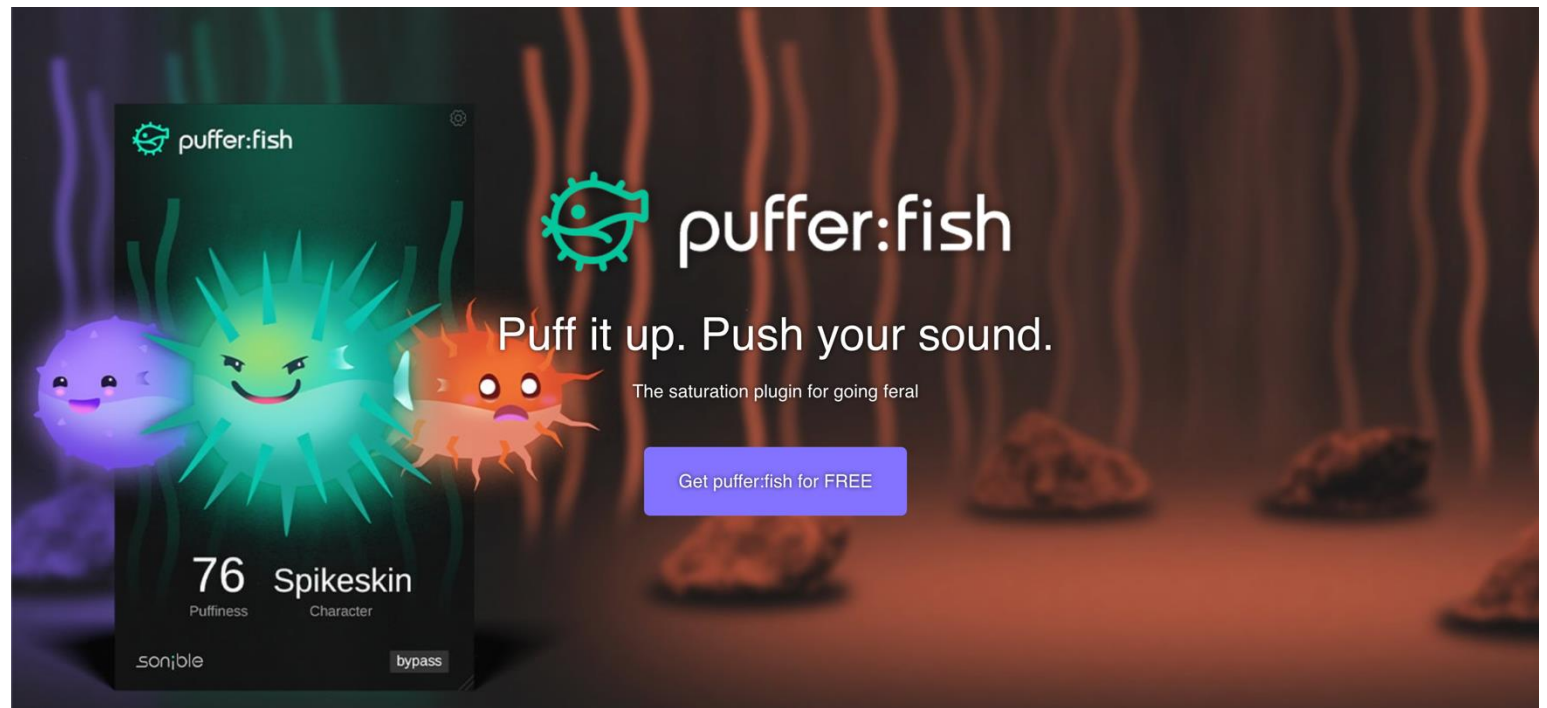


Embracing nonsense

Temperature's Lack of Correlation with Music

- Despite claims of popularity for researchers, temperature has no correlation with music's long historical framework.
- Temperature is a tool of digital and statistical alienation to represent human behaviour.
- It forces the musical into a new form of constraining technology that has no prior use, reference, or explanation.

Black Boxes and the Difficulty of Creativity for Programmers



Buzzing. Textured. Unpredictable
Twitchgill – unhinged by design

Twitchgill lives in the space between control and chaos. It starts warm, but the harder you push it, the more unpredictable things become. This is where saturation turns into character and personality starts to show.

Twitchgill adds harmonics that react dynamically to the input signal, creating movement, grit, and edge. At lower settings it can add life and presence. Push it further and the sound begins to twist, buzz, and bite back.

This character is made for experimentation. Drums, basses, synths, loops, and sound design all come alive when Twitchgill is in charge. It rewards curiosity and invites you to keep turning the knob just a little more.



The Twitchgill character is a small, orange, spiky fish with large eyes and a purple mouth. To its right is a control panel with three sliders: 'Grittiness' (5 stars), 'Fishiness' (5 stars), and 'Smoothness' (5 stars). The 'Smoothness' slider has a small icon of a fish with a gear inside its mouth.

Conclusions

- Homeostat is foundational to early Cybernetics
- Despite the desire to produce new things, homeostatic ideas cannot easily be escaped from by AI music applications
- Homeostasis is less useful in artistic domains if the intention is to create radical or new music
- Interfaces are a programme designer's way of "putting words in the user's mouth." (Offert and Phan 2022)
- "Decisions-embedded-in-design have significant ramifications." (Caplan et al. 2018)
- Coupled with black boxing, these reduce the presence of musical language and correlates to a handful of descriptors such as tempo, key and mood.

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