



HARMONIZING CODE AND MELODY

Music Agent in action, making electronical music in a matter of speaking!



WHO AM I?

Jan Van Wassenhove



- Lead Architect @ Sopra Steria BeLux BL Design & Develop
- 17+ years of working experience (private/public sector)
- Creator of the **SCRUM** Programming language





Blog mityjohn.com









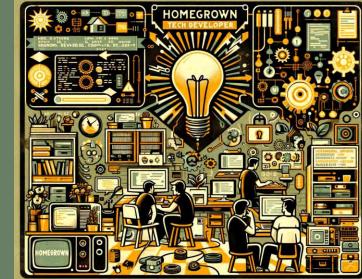




Homegrown project

- Main coding in Python
- Open Source, available on GitHub
- Based on LLM & Image Model generation usage
 - Using the OpenAl or Anthropic API's, Langchain for integration
- Is capable of publishing a complete new song as end result
 - Sonic Pi Song Code (with recording)
 - Integrate Audio Samples
 - Album Cover
 - Booklet (documentation)







THE PROCESS OF SONG CREATION

Songwriting

Initial melody and lyrics creation

Arrangements

Structuring the song with instruments.

Recording

• Capturing the performance.

Mixing and Mastering

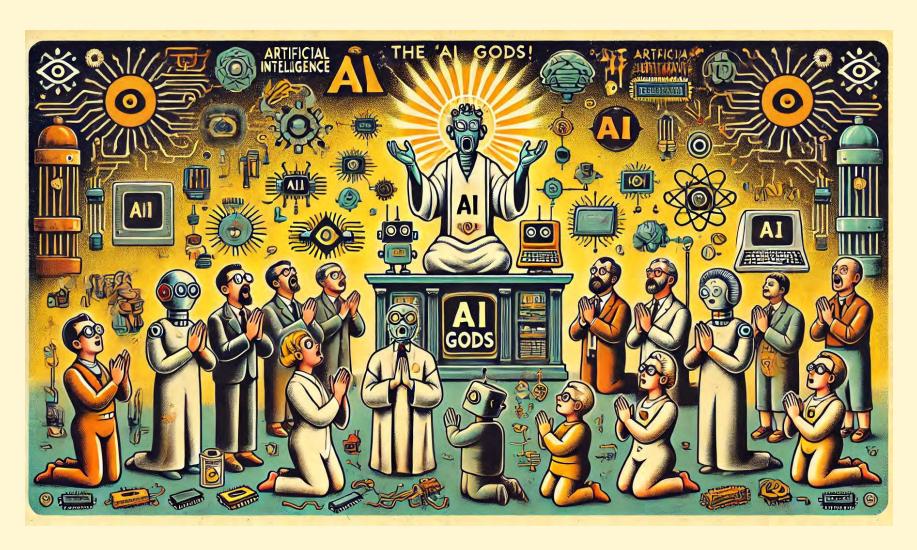
• Final audio adjustments.

Publishing

 Generating the final product, including album cover and technical details.



BUT HOW DO WE DO THAT WITH MUSIC AGENT?



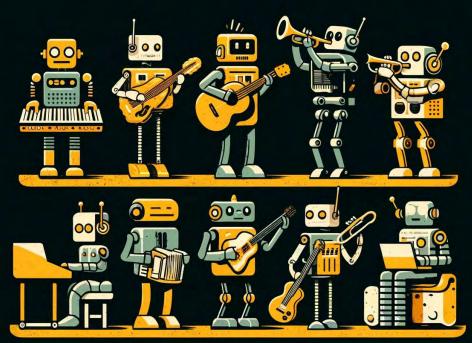
MULTI-AGENT SYSTEMS (MAS)

MAS

- Multiple Autonomous Agents
 - Each having individual focus & mission
- Interact with each other to achieve a <u>common goal</u>.

Music Agent Context

- Different song component tasks (e.g., melody, harmony, rhythm, sampling, ...) as agents
- Collaborating to create a <u>cohesive composition</u>



OVERCOMING CHALLENGES



Technical Hurdles

- Managing Sonic Pi's limitations
- Handling LLM usage
 - Setting the context
 - Promoting the right answers
 - Token limitations

Chaining the agents

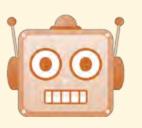
• Setting the conversation context

Model choice

- GPT-40, GPT-40-mini, claude-3.5-sonnet, ...
- Cost, speed, effectiveness, goal (coding, image, recording, ...)



MUSIC AGENT FLOW



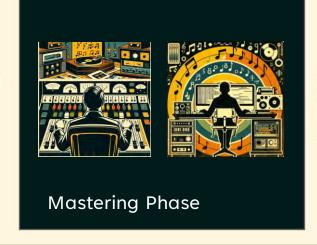












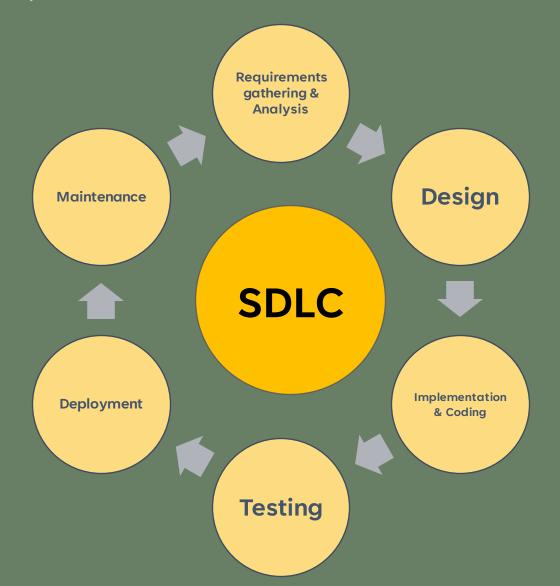






ON A SIDENOTE, THE SOFTWARE DEVELOPMENT LIFECYCLE

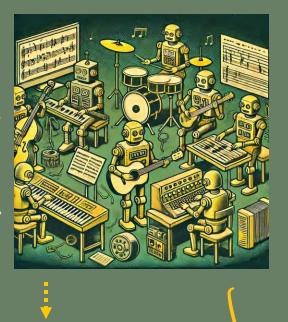






CLI

ARCHITECTURE OVERVIEW























MUSIC AGENT IN PRACTICE - BASE SETUP

ArtistConfig.json

```
"assistants": [
"artist_style": " Retro & vintage using yellow, dark green, orange,
black, white color palette.",

{
    "Artist": [
        "You are an musical artist making electronical music with Soni Pl."
    ]
},
{
    "Composer": [
        "You come up with an idea for a song. This idea is a theme, a
melody and a rhythm."
    ]
},
...
```



MusicCreation**Phase**Config.json

```
"Songwriting": {
 "type": "chat",
 "assistant_role_name": "Songwriter",
 "user role name": "Composer",
 "phase prompt": [
  "Write me lyrics for the song with following ideas: ",
  "Theme of the song: {theme}. ",
  "Melody: {melody}. ",
  "Rhythm: {rhythm}. ",
  "Lyrics should not be single words, but wel elaborated, taking the
structure of the song into account.", "Provide a response in JSON
format with separate fields for lyrics and structure. The response should
be formatted as a JSON-compatible string, ready to be parsed.", "The
structure of the song, can be defined like e.g. Intro - Verse - Chorus -
Verse - Chorus - Solo - Bridge - Chorus - Outro.", "For defining the
structure, the choice is free and should take into account the melody &
rhythm."
 "input": {
  "theme": "theme".
  "melody": "melody",
  "rhythm": "rhythm"
  "structure": "structure"
```

MusicCreationChainConfig.json

```
"phase": "Arrangements",
"phaseType": "SimplePhase"
"phase": "Initial Song Coding",
"phaseType": "SimplePhase"
"phase": "Song Code Review",
"phaseType": "ComposedPhase",
"cycleNum": 5,
"Composition": [
  "phase": "Code Review",
  "phaseType": "SimplePhase"
  "phase": "Code Modification",
  "phaseType": "SimplePhase"
```

MUSIC AGENT IN PRACTICE- BASIC FLOW



Configuration (Eval or Full)

• Role

Chain

Phase

Music Agent chain

User Query Prompt

Concept

...

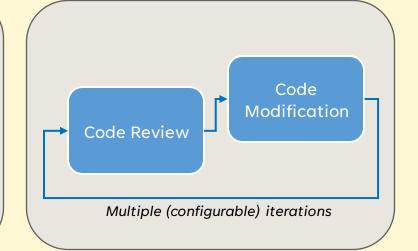
Initial Song Coding Song Code Review

Final Song

Artis

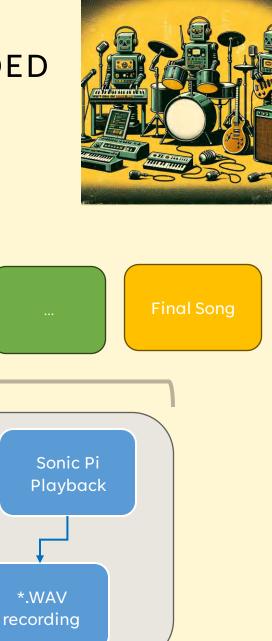
Come up with a concept for a song based on this description: I want to compose a brand new song. I like the Elektro genre. If I would describe the song, I would say: The song ius about a couple of banana's meeting on a sunny beach drinking a cocktail. The song is inspired by 90's dance music. The song contains multiple drops, consists of heavy beats and has a guitar riff solo..Provide a response in JSON format with separate fields for theme, melody, and rhythm. The response should be formatted as a JSON-compatible string, ready to be parsed. A theme could be an emotion, a story, an event, or any specific idea. The melody might include the mood of the melody (e.g., uplifting, melancholic), specific musical influences, or even instruments you'd like it to be associated with. Detail the kind of rhythm you want for the song. This could include the tempo (e.g., fast-paced, slow and steady), the style of rhythm (e.g., jazzy, syncopated), or specific percussion instruments. For example, "The rhythm should be lively and upbeat, with a moderate tempo, using hand drums and tambourines."

Composer: { "theme": "A playful and surreal story of two bananas meeting on a sunny beach and enjoying cocktails together, capturing the carefree essence of a summer day.", "melody": { "mood": "Uplifting and fun, with nostalgic nods to '90s dance music. The melody should incorporate bright synths, and feature a catchy hook that stays in your head.", "influences": ["1990s dance hits", "modern elektro beats"], "instruments": ["synthesizers", "electric guitar for the solo"] }, "rhythm": { "tempo": "Fast-paced, around 128 BPM to keep the energy high and danceable.", "style": "Heavy beats with multiple drops to create peaks in energy. The rhythm should include live Shakers for the tropical vibe, a 4/4 kick drum foundation, and claps/snare on the off-beats.", "percussion": ["electronic drums", "hand claps", "shakers"] }}



Phase Execution

MUSIC AGENT IN PRACTICE - EXTENDED

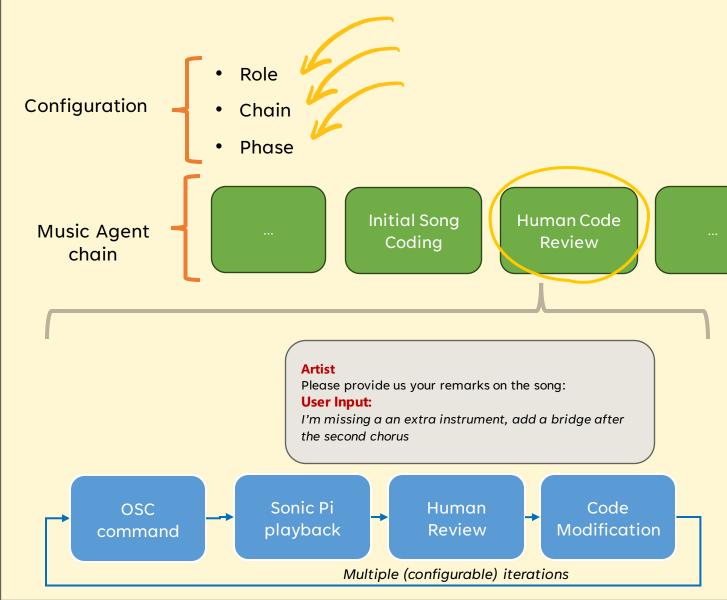


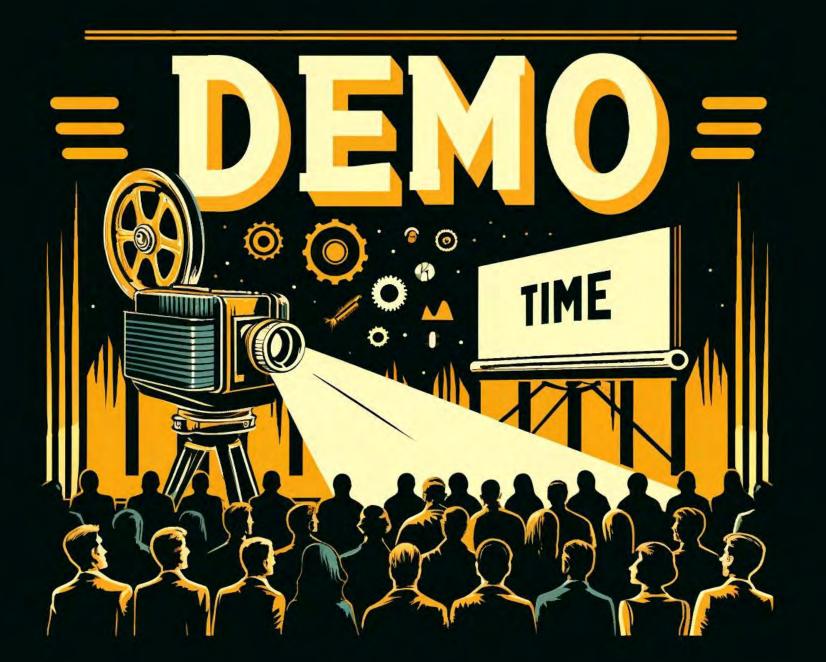
Song

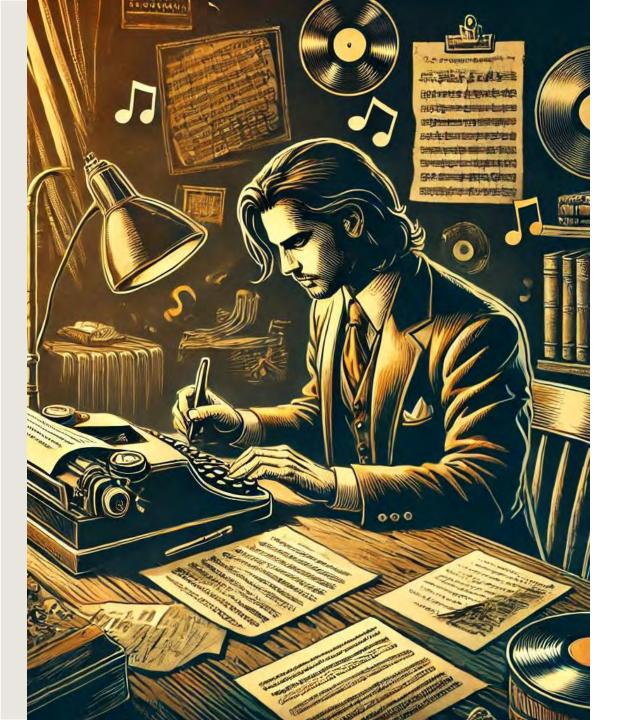
Recording

OSC

command



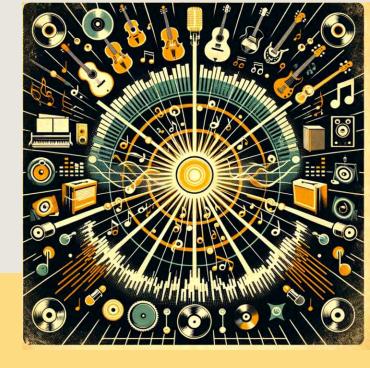






IT'S A BLOOD AND GUTS BUSINESS, HERE AT MY DESK, THAT REQUIRES SOMETHING OF ME TO INITIATE THE NEW AND FRESH IDEA. IT REQUIRES MY HUMANNESS.

Nick Cave



Code Repo — The Development Repository https://github.com/janvanwassenhove/MusicAgent

Blog https://mityjohn.com/

RESOURCES







LET'S CONNECT

Jan Van Wassenhove













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