Popular Music Practice and Research

Introduction

Throughout the course of this major project, I plan to compose and compare a portfolio of songs written with artificial intelligence (AI) and use this data to develop my own songwriting tools. This could vary from a prototype AI program that can devise melodies or lyrics to a curated list of songwriting prompts aiming to mimic analogue methods of the same concept. To achieve this, current market leading AI songwriting tools will be analysed and compared through Practice as Research (PaR). This will be achieved by composing a range of songs using these tools and critically reflect on the process, comparing differences in audience perception, time spent and user friendliness. Questions that inform the research will include: What is the effectiveness of AI in music creation currently? Can an average music consumer distinguish between AI and human composition? Would a commercial audience voluntarily listen to AI generated music based purely on the concept? How would this project look as a live performance? Can this research or potential prototype be utilised to gauge what music might become popular in the future?

Abbreviations

AI – Artificial Intelligence
AIM – Artificial Intelligence Music
AIPM – Artificial Intelligence Popular Music
GPT – Generative Pre-Trained Transformer
PaR – Practice as Research

Literature Review

Some key academic texts, journals and articles that have informed this research include:

- o Robin Nelson's (2013) *Practice as Research in the Arts: Principles, Protocols, Pedagogies, Resistances* provides an in-depth understanding into PaR, particularly chapter 2 which is titled 'From Practitioner to Practitioner-Researcher'. The complementary writing layout of "location in a lineage, conceptual framework and amount of process" has informed the writing for this research and documentation. Nelson's PaR model and the acceptance that "knowledge is not fixed and absolute" are especially prevalent within this work due to the everchanging nature of working with AI.

- o Melissa Avdeeff's (2019) article *Artificial Intelligence & Popular Music: SKYGGE, Flow Machines, and the Audio Uncanny Valley* presents an overview of SKYGGE's AI-human collaboration album *Hello World.* It features a case study on current and emerging uses of AI in popular music production, whilst addressing growing concern of the use of AI in music composition in general.

- o The article *How I Created A Lyrics Generator: Using AI To Write A Hit Song* by Eric Borgos (2020) provides an honest insight to approaching creating a lyric generator as a "real human songwriter". This includes approaches to coding and utilising existing AI songwriting tools in conjunction with one another.

- o Graham Gibbs' (1988) *Learning by Doing, A Guide to Teaching and Learning Methods* has influenced how the progression from this module to the major project will be documented. Using the Gibb's Cycle, each session when composing or programming will be documented for critical analysis purposes.

- o Alice Flaherty's (2004) book *The Midnight Disease: The Drive To Write, Writer's Block and The Creative Brain* focuses on writer's block within the

literary writing community and the psychology and brain anatomy behind it. Many of her theories, reasonings and suggested solutions can be applied to any creative writing, including lyrics. One of the main purposes of commercially available AI-powered songwriting tools is to reduce the time taken to compose music and eliminate songwriter's block. This is useful to the major project as it will inform how to best combat songwriter's struggles

Methodology

The majority of this project is focused on PaR, by utilising the existing technologies that are available to compose a portfolio, this will provide a first-hand experience for a working practitioner. This knowledge has been compiled both into a spreadsheet to compare and track different AI software and Gibbs' (1988) reflective logs to monitor progress. Since the start of this research, a Gibbs' reflective log has been maintained after each songwriting session with different AI models, shown in Appendix Six. This log will be used to critically reflect on the method of composing using AI and discovering which software creates the best workflow and product for the major project.

To understand to validity that AIPM could have in a commercial environment, a focus group will be conducted to consider whether audiences could distinguish between various levels of human input alongside AI generated lyrics and music. Similar surveys have already been conducted, such as TickPick's (2021) study that was "designed with the intent of testing human ability to correctly identify AI-generated lyrics, as well as their opinion on creativity, emotionality, and favourability of various lyrics presented to them". This study specifies there was no modification to the songs

composed by their AI except to "censor expletives found in hip-hop/rap songs" (*ibid.*).

Almost one in four people (22.2%) thought that AI lyrics were attributed to American

Country Singer-Songwriter Garth Brooks and only 12.3% of participants could tell

that the country lyrics were AI-generated (*ibid.*). This research provides an

interesting insight to existing audience perceptions of unaltered AIM, which a case

study focusing on a combination of AIM and human collaboration would elaborate

on.

Project Activity

In preparation for the major project, a comprehensive PaR exercise was undertaken

to compare and contrast existing AI models. These included: *Magenta, Scaler 2,*

Bored Humans, Audoir and *These Lyrics Do Not Exist*. Some AI software make

exclusively audio or MIDI whilst others solely create lyrics, therefore a combination of

two separate software was typically used to create a full song. Alongside the four

songs generated using AI, two additional songs were composed to showcase an

analogue version of the same technology. Similar to David Bowie's *Verbasizer*, a

derivative of the cut-up technique, which was dependent on literary source material

such as a news article or fictional work, which had been cut-up and reordered into a

potential starting point for lyrical works (Braga, 2016). When deciding what to use as

input data for each AI software, they needed to all be similar to make the comparison

between each song comparable. Therefore, the first song to be composed utilised

the cut-up technique as lyrical stimulus. The line "gazes met in a mirror, and he

smiled at me" from Anna Pitoniak's (2017, p.83) *The Futures*, was selected and

subsequently used in each AI software that allowed for a lyrical input data. The rest

of the page from *The Futures* was cut-up and reordered to form a new song entirely, this process is shown in Appendix Four.

The sixth song was written using a songwriting prompt from SongFancy's 5in5 challenge which is designed to overcome writer's block with a "super fast paced speed-writing challenge [that] is one of the best and quickest ways to write through your negative inner dialog[ue]" (SongFancy, 2021). In a similar way that AI requires input data, these aesthetic prompts provide both visual and written stimuli to assist songwriters in composing five songs within five days.

The aim of using both AI and analogue songwriting tools was to establish a location in a lineage. Computer-generated music initially appeared in the 1950s, which focused primarily on algorithmic music creation. This opened up endless possibilities for computational systems which could potentially "recognise, create and analyse music" (Ranwala, 2020). Whilst AIM software has developed exponentially since its initial conception in 1951 (*ibid.*), through first-hand experience using current market-leading technology, arguably it's best use is to assist human songwriters to overcome writer's block. Writer's block can stem from "self-criticism or perfectionism as a source of block" (Flaherty, p. 82). Therefore, by removing the self-criticism aspect of songwriting by utilising AI songwriting tools, this block can be resolved. Further sources of writer's block such as the "strangled feeling of inarticulateness, of ideas coming faster than words, of not being able to express what's inside" (*ibid.*) can be resolved by utilising OpenAI's GPT-3. This is now the largest 'text in, text out' model, capable of generating "100 pages of content from a trained model" (Sagar, 2020). The GPT-3 model only requires a single word to produce additional text

therefore songwriters using this software could use the AI to generate words at the same rate as their ideas, if not quicker.

Many of the current AI songwriting tool models restrict the composition elements to diatonic chord sequences and melodies within a standard key signature. It is common to find terms such as "happy" or "sad" as opposed to "major" or "minor", shown in Figures One and Two are the options for *AIVA* and *Audoir*.
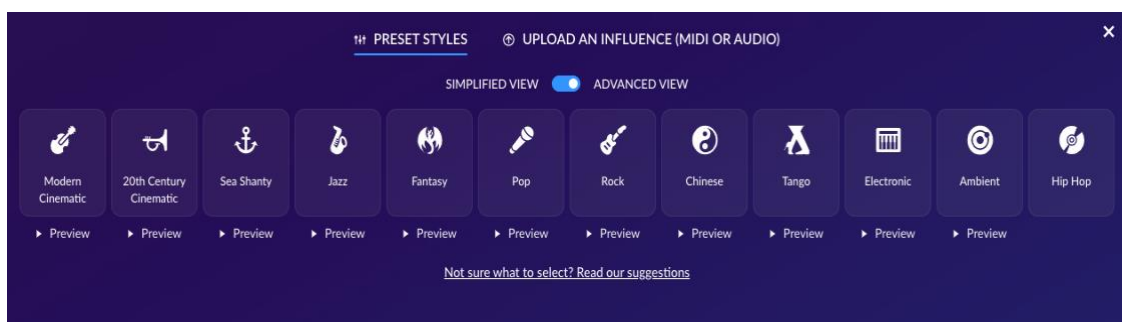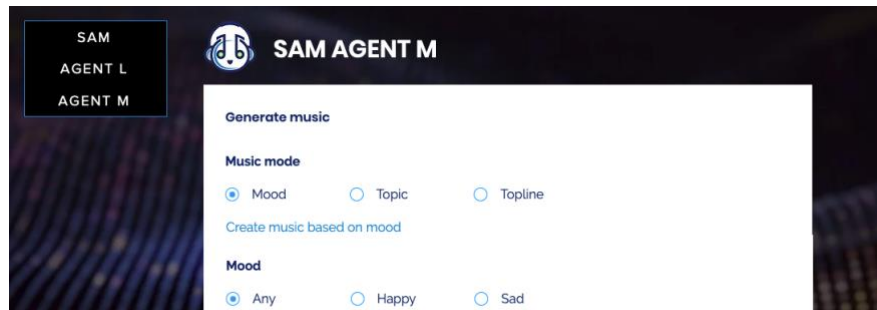

Figure 1 (AIVA, 2021)

Figure 2 (Audoir, 2021)

This is making music creation more accessible for those who lack a formal music education. Taryn Southern, who released a collaborative album with AI software Amper, originally turned to composing with AI because she knew "very, very little about music theory" (Deahl, 2018). Using *Scaler 2*, an AI songwriting tool that develops chord sequences and "creates melodic phrases that automatically adapts to […] chords and scales" (Scaler Plugin, 2021), it is possible to compose in various scales and modes and irregular time signatures. However, pushing the boundaries by experimenting with irregular time signatures, non-diatonic chord sequences and

modes asks the question: does commercially successful music have to adhere to typical conventions?

It can be argued that AIPM needs experimentation, many AI's are trained through deep learning consisting of layers of neural networks. This means they require a large database to capture the concept of what they are designed to create (Globant, 2017). Can an AI that create music develop its own signature style if it has learned from pre-existing music? The development of AIM could lead to the music creation industry being "locked in a loop of repetition, generating only minor incremental advancements" (Charles, 2021). This research and premise will be furthered on in the development of the major project.

Artificial intelligence is already prevalent in the music industry outside of music creation and production. *Spotify's Web API developer guide* provides data for thirteen audio features (Chu, 2021a), these can be analysed to offer an insight into the history of music and potentially what future trends will occur. Focusing on tempo[1] in particular, an aspect that can be easily quantified, the most popular tempo for music is around 120BPM, sho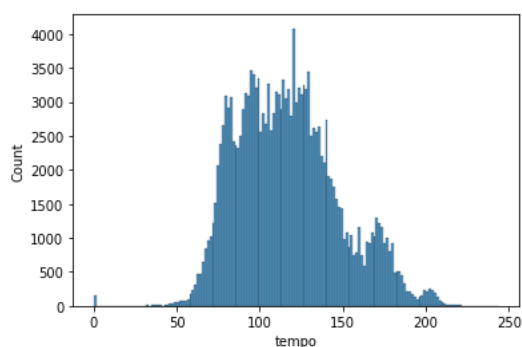wn in Figure Three. Other audio features are not as easily quantifiable, for example danceability in this study is defined as "how suitable a track is for dancing based on a combination of musical elements including tempo, rhythm stability, beat strength, and overall regularity" (*ibid.*). As part of the major project, all thirteen aspects of the

Figure 3 (Chu, 2021b)

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[1] Defined in this study as "The overall estimated tempo of a track in beats per minute (BPM). In musical terminology, tempo is the speed or pace of a given piece and derives directly from the average beat durations (Chu, 2021a).

audio features will be compiled and inputted to an AI model to compose a song that, according to this study, should have the ability to become a commercially successful piece of music.

Utilising similar research and findings, start-up *HitWizard* features an AI "specifically trained to predict the next big hit to take the music industry by storm" (Mix, 2017). This technology could successfully predict which song would be successful at a rate of 66 percent yet could guesstimate that a song would be unsuccessful with an accuracy of 93 percent (*ibid.*). Although *HitWizard* is no longer operational, the research the company started can be utilised to potentially set new parameters using Chu's aforementioned 2021 study from *Spotify's Web API developer guide.*

Conclusion

By the end of this project, the aim is to have a fully realised portfolio of songs composed using AI, with one of those utilising the audio features from Chu's (2021a) research. A prototype of a lyric generator using OpenAI's GPT-3 and a basic AI program to generate music or rhythms in MAX MSP will hopefully be used to generate some material found in the portfolio of songs to accompany this research.

Using my reflective logs from the initial AI songwriting process, the most effective workflow was discovered using a combination of *Scaler 2* and *Bored Humans.* The resulting song "Innocence" felt the most unique out of the six composed, even if not necessarily commercially viable in the current popular music scene. By using the two aforementioned AI software and the thirteen audio features researched by Chu (2021a), the major project will have the initial starting point for composing a portfolio.

Through researching existing AI songwriting tools, it is now clear which features will be prioritised in my own. For a lyric generator, having a lyrical input is of great importance as it allows the songwriter to customise the topic and develop initial ideas they might be struggling to finish. User friendliness in any software is also crucial, when using AI to overcome writer's block a songwriter might already be frustrated and being unable to clearly articulate what they want the software to produce could add to this. For AI generated melodies or chord sequences, it is imperative to have control regarding the time and key signatures as opposed to a mood or feeling. This allows the user to experiment with modes, irregular time signatures and other features not commonly found in this software or popular music. This will also give the user more control over the whole sound of the piece they are creating, rather than simply adhering to the vagueness of a feeling.

Music composition and AI are still a relatively new commodity to the popular music scene, shown in Appendix Five. There are still many questions that require answers, such as: What is the effectiveness of AI in music creation currently? Can an average music consumer distinguish between AI and human composition? Would a commercial audience voluntarily listen to AI generated music based purely on the concept? How would this project look as a live performance? Can this research or potential prototype be utilised to gauge what music might become popular in the future? Therefore, I plan to explore these interesting lines of enquiries that this research has already briefly investigated.

2319 words

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Appendix One – Timetable
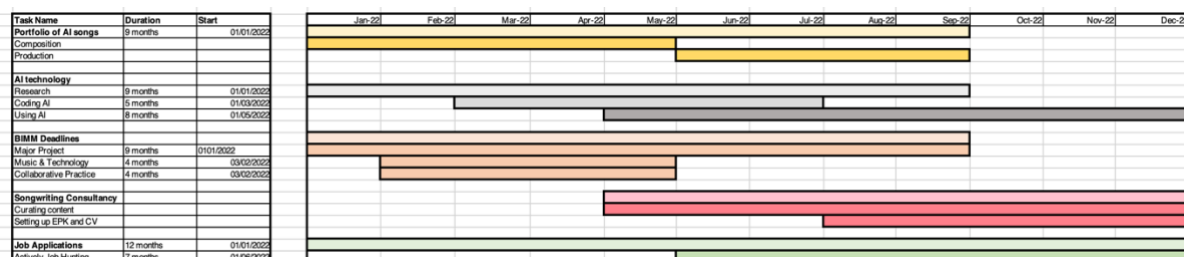
Appendix Two – BIMM Postgraduate Primary Research Ethical Review Form

- Uploaded Separately

Appendix Three – Spreadsheet of AI software used

AI Name	Information Available	Uses	Practicality	Link
Audoir (Agent L)	SAM was trained with hit songs, using copyrighted material for "transformative uses" falls in the Fair Use doctrines under US copyright law. In addition, SAM uses a plagiarism checker to ensure that none of the generated music and lyrics plagiarises from the hit songs. Our plagiarism checker makes SAM one of the most ethical AI music tools ever developed.	Generates lyrics	Generates large amounts of text using GPT3. Input data can either be a mood (any/happy/sad), text to lyrics or rhyme line. User interface is simple and easy to use. This process takes between 30 and 60 seconds.	https://www.audoir.com/sam-agent-l
Audoir (Agent M)	SAM was trained with hit songs, using copyrighted material for "transformative uses" falls in the Fair Use doctrines under US copyright law. In addition, SAM uses a plagiarism checker to ensure that none of the generated music and lyrics plagiarises from the hit songs. Our plagiarism checker makes SAM one of the most ethical AI music tools ever developed.	Generates music (either MIDI data or audio)	Genrates audio and MIDI data based on either a mood (any/happy/sad), text or for a topline melody. User interface is simple and easy to use. This process takes between 30 and 60 seconds	https://www.audoir.com/sam-agent-m
Amadeus Code	Amadeus Code is an artificial intelligence powered songwriting assisstant. Primarily used for creating chord sequences to inspire topline melodies.	Generates music (either MIDI data or audio)	Generates audio in the app quickly but many of the songs clearly take inspiration from other popular songs. Amadeus does tell you which song it has taken inspiration from but I felt this could actually influence my songwriting negatively by being aware of other melodies that coincide with this chord sequence.	https://amadeuscode.com/en/

Jukebox				https://github.com/openai/jukebox/
AIVA	AIVA assists with the creative process of creating music by leveraging the power of AI-generated music	Generates music (either MIDI data or audio)	Generates music based on pre-set styles such as modern cinematic, jazz, pop etc. This is then customisable through key signature, pacing (tempo), instrumentation, duration and variatons on a theme. It will produce these with or wihtout a melody. Alternatively, AIVA will accept MIDI or audio as input data or use an existing influence.	https://creators.aiva.ai/
Flow Machines	Flow Machines is a research and development and social implementation project that aims to expand the creativity of creators in music. Music has been expanding together with new technology and creators who have applied them to music creation. Flow Machines is working iwth creators to generate new music using cutting-edge machine learning technology.	Unknown	Unavailable for download/purchase currently	https://www.flow-machines.com/
Magenta	Magenta is an open source research project exploring the role of machine learning as a tool in the creative process. Currently in the beta stage, the magenta studio includes continue, generate, drumify, interpolate and groove which each manipulate and generate midi and audio data.	Generates music (either MIDI data or audio)	Very simple, quick and easy to use.	https://magenta.tensorflow.org/
Nsynth	Also known as the Neural Synthesizer, Nsynth uses deep neural networks to generate sounds at the level of individual samples. Learning directly from data, Nsynth provides users with intuitive control over timbre and dynamics and the ability to explore new sounds that would be difficult to acquire with a traditional synthesizer.	Generates audio for use in a synthsizer	Haven't used, struggling to find a download link	https://magenta.tensorflow.org/nsynth
Scaler 2	Scaler 2 features Audio and MIDI detection, melodic phrases and performances, modulation presets and suggestions, new chord pad and playback editing modes. It also contains more than 30 built-in sounds and 200 chord sets created by artists.	Generates MIDI data for use within a DAW	Costs £50 but well worth the investment, very quick and easy to use.	https://www.scalerplugin.com/
Bored Humans	The song lyrics on this page are generated using a language model named GPT-2, which was created by OpenAI. It works similar to autocomplete on your mobile device, where it predicts the next word based on what you are typing. We fine-tuned this model on song lyrics, and have it predict lines for a song instead of only predicting one word at a time. Link to article on how this was made: https://towardsdatascience.com/how-i-created-a-lyrics-generator-b62bde13badb	Generates lyrics without an input	Free and easy to use, due to the lack of an input the lyrical content can be quite random and ocassionally repetitve or predictable.	https://boredhumans.com/lyrics_generator.php
These Lyrics Do Not Exist	This website generates completely original lyrics for various topics, uses state of the art AI to generate an original chorus and original verses	Generates lyrics with an input	Free and easy to use, can be very repetitve and rudimental but is intended mainly to inspire songwriters rather than be used as it is	https://theselyricsdonotexist.com/

Appendix Four – Videos of AI songwriting process

-    Uploaded Separately

Appendix Five – Timeline of AI in music

AI and The Music Industry

A history of arti cial intelligence and the popular music industry

RACHEL_MEDDINGS   OCT 19, 2021 03:59PM

1951

Alan Turing creates the   rst computer generated music. Several melodies were created, including "God Save the King" and "Baa, Baa Black Sheep".

1957

The   rst musical work written by a computer, developed by Lejaren Hiller and Leonard Isaacson, the Illinois Automatic Computer (ILLIAC I) generated compositional material that was entirely written by AI. The resulting piece was named 'Illiac Suite for String Quartet'.

1960

The   rst academic paper on algorithmic composition was published by Russian researcher, R. Kh. Zaripov. He focused on music composed using the URAL-1 computer and the paper was titled "An algorithmic description of a process of musical composition".

1965

The   rst instance of computer-generated piano music. Ray Kurzweil, an American inventor, premiered a piano piece that was composed by a composer that was capable of pattern recognition in a variety of musical compositions. This computer was then able to analyse and use these patterns to compose and create new melodies.

1973

MIT's Experimental Music Studios (EMS) was founded by professor Barry Vercoe and became the   rst institute to have digital computers solely dedicated to researching the creation of computer-generated music. EMS were responsible for the development and research of many crucial computer music technologies such as: real-time digital synthesis, live keyboard input, graphical score editing, programming languages for music composition and synthesis.

1974

The   rst International Computer Music Conference was held in Michigan State University, it is now yearly international conference for computer music researchers and composers. The conference for 2021 was held at Ponti cia Universidad Catolica de Chile from July 25th-31st.

1975

Researchers from the MIT Experimental Music Studio published a paper "Machine perception of musical rhythm" and developed software for intelligent music perception that could register and infer a count, tempo and note duration as a musician played on an acoustic keyboard.

1980

Experiments in Music Intelligence (EMI) had a major breakthrough in 1980. EMI could generate new and unique music compositions based on generative models that analysed existing music. Using the speci c framework of music genres, EMI has created thousands of different works based on countless composers.

1988

Sony Computer Science Laboratories were founded to solely conduct research relating to computer science. This company would later be considered as on the milestones for utilising AI in music research and Sony would later produce Flow Machines, one of the current industry leaders for AI composition.

1995

David Bowie and Ty Roberts develop an app named the "Verbasizer". This, similar to the cut-up method, took literary source material and randomly reordered the words to develop new combinations and potential lyrics.

1997

The music research team project at Sony Computer Science Laboratory Paris was founded by Francois Pachet. He started research that focused on music and AI, his team wrote and pioneered many technological advancements and filed more than 30 patents focused on AI and electronic music distribution, audio feature extraction and music interaction.

2002

A new algorithm "Continuator", designed by Francois Pachet, could learn and interactively play with musicians when performing live. Once a musician stopped playing, Continuator could continue to write a piece of music from the place where the live music stopped.

2009

A program named Emily Howell composed an entire musical album aptly named "From Darkness, Light". Emily Howell is an interactive interface that registers and takes into account feedback from listeners and creates its own compositions from a database.

2010

Iamus Computer, an AI, creates it's first musical composition named "Iamus' Opus One". It is the first instance of professional contemporary classical music to be composed by a computer AI using its own unique style.

2012

Emily Howell, the aforementioned program releases 'her' second album named "Breathless".

2016

Researchers at Sony create "Daddy's Car", an AI-generated pop track entirely composed by AI. Sony's software "Flow Machines" drew from a large database of songs to compose new music, in this instance the track was mostly based on The Beatles' catalogue.

2016

An AI generated track composed with artist Alex Da Kid enters the Top 40 charts in the USA. The AI software, IBM Watson, analysed a large number of articles, blogs and social media data to feature the most current and up-to-date topics to characterise the overall emotional mood.

2017

Taryn Southern released her album "I AM AI", a collaborative project between Southern and AI music composer tool Amper. Amper created the music structures but the rest of the work, including lyrics, were added by Southern.

2019

AI meets death metal! Dadabots set up a constant 24/7 livestream YouTube channel playing heavy death metal music that is completely generated by AI algorithms. To train neural networks using machine learning, the developers used the music of "Archspire" a Canadian metal band. The resulting compositions sounded like real death metal music.

2019

Björk collaborated with Microsoft to create AI-generated music named "Kórsafn", which is based on the changing weather patterns and position of the sun. Kórsafn used Björk's back catalogue of 17 years to create new arrangement in a familiar style.

Appei   ******

AI Songwriting Diary
*Reflective Diary documenting the composition process of each song using Gibbs'
Reflective Cycle*

Song 1 – 25th October – Cut Up Method "Don't Know What I'd Do Without You"

1. Description

I started this session by selected the page I wanted to use from the book *The
Futures* by Anna Pitoniak, then I cut the page into individual words and three
phrases that were particularly memorable. I then randomly and blindly chose one
word at a time and laid them out one by one to make some lyrics. After this, I took a
more curated approach where I laid the words out alphabetically and chose one
word at a time from the list. Following the lyric selection, I wrote down chords on
pieces of paper and chose four randomly and blindly from a tub and used a
combination of the lyrics and chords to compose the song.

2. Feelings

I felt happy that the stimulus I had created helped me compose a song much quicker
than normal but creating the stimulus itself was quite time consuming which was
frustrating. It made me sad to physically cut up a book, but it felt worth it for the
outcome of the song.

3. Evaluation

The lyrics were a little nonsensical, even when I took the decision to curate the
selection process. When I randomly chose the words, the lyrics made little to no
sense, so I had to take a different approach. The chords that were randomly selected
didn't make a cohesive sequence, so I opted to remove the non-diatonic option I had
pulled out.

4. Conclusions

I learned that it would probably be better to use sentences or phrases rather than
individual words as this could retain a sense of the original material whilst creating
something new.

5. Actions

If I use a model similar to this method to create my own AI songwriting tool, I will
need to code a way to remove excess and repetitive words. Need to ensure for
future songwriting that if only provided with the lyrics, I don't compose melodies and
chord sequences that are very similar to each other. Options to guarantee this
include

Song 2 – 27th October – Songwriting Prompt "Beck & Call"

1. Description

I found the songwriting prompt from SongFancy's 5 in 5 challenge which is intended
to inspire songwriters to quickly compose five songs in five days. I started by
grouping words that would work well together, such as "whipped" and "whirring", and
chose which words from the prompt I would omit as they didn't fit with the others,
these were "olive" and "apron". I then used the chords provided with the challenge
and started composing a top-line melody and slotting the words into suitable sections

of the song and tried to steer away from the obvious uses of the words. For example, the prompts clearly lean towards a coffee shop or kitchen setting, yet I avoided any of these comparisons. I decided to create a lyrical theme around an unhealthy relationship, being with someone who is sickly sweet and "tastes like syrup", yet also makes you "whipped", and your head feel like it's "whirring".

2. Feelings

I felt that the lyrical content, although curated by a pre-selected list of words, were authentic and the words felt like they had some real weight to them. I felt happy that I had composed a new song quite quickly from a starting point and that I had taken the lyrics in a direction that they weren't intended for.

3. Evaluation

I think this song has some real commercial validity, the chorus and hook are catchy, the lyrics and melody are suitable and memorable and the songwriting process was significantly shortened by the inclusion of the prompt.

4. Conclusions

I don't think that this method of composition can be really considered AI, as all the composition, except for eight words, came from a human. Though the resulting song is proof of a concept that these resources can assist songwriters in creating new music.

5. Actions

It might be interesting to experiment with an AI generated songwriting prompt that can create visuals with a selection of randomised words? As a general improvement on my songwriting outside of AI composition, I will use more songwriting prompts from the 5 in 5 challenge.

Song 3 – 11th November – Audoir AI "Another Rose"

1. Description

Audoir is one of the few AI software that can produce both lyrics and melodies, I took the prompt from Song 1 "gazes met in a mirror, and he smiled at me" into the lyric generator which gave me three paragraphs of material. I selected four lines from these paragraphs and input those into the music generator, which gave four different melody options that I exported as MIDI data. Once I had these MIDI files in the same key and tempo, I added chords underneath and simplified the melodies, as many of them had repeated notes that would be too quick and difficult to sing. I didn't stray far from the original melody that was provided and only added three lines in total to the lyrics. I did, however, move a couple lines around to create a makeshift rhyme scheme that mostly consist of half and assonant rhymes.

2. Feelings

I felt relieved at how quick and efficient this software was to use, especially for someone who has never used it before. I felt happy to successfully complete a song using almost exclusively AI generated material and how quick the overall process

was. I was a little bit sad that the AI came up with some lyrical content that I thought was better than I would have written given the same stimulus, for example: "I knew he wondered at the scheming universe".

3. Evaluation

The lyrical content added more value to my songwriting process than the melody, but that could have been from the sheer number of lyrics that were generated in comparison to the four melody lines that were devised. The process required significantly less brain power and input from a human songwriter which meant I could achieve more for less energy.

4. Conclusions

I would use Audoir again, the lyric generator was more beneficial to my songwriting process and it created a vast amount of content from a small input.

5. Actions

I don't think I would change anything about the songwriting process with Audoir, it was very effective, quick and easy to use - the resulting song was indicative of this.

Song 4 – 12th November – Magenta AI "Duplicating"

1. Description

I used Google's Magenta AI to initially generate 4 bars of music, this composed a bass line, drumbeat, chord sequence and top line. I then took the drumbeat and fed that to the Groove tool which changed the MIDI drum file slightly and made it 'groovier'. I then used the Song Lyrics Generator, which is intended to create a starting line for a song rather than use the prompts in a linear verse like I did. The lyrics generated were a little nonsensical, with lines like "I've been hearing eyes" and "duplicating duplicating duplicating". I didn't change those though, I tried not to interfere with the AI generated material and create an authentic representation of what the software is capable of.

2. Feelings

This song didn't really hold any commercial validity, but I still thoroughly enjoyed the process of making the outrageously random lyrics have some coherence in the form of a song. The resulting piece made me happy as it showed the fun side of composing with AI and took the seriousness of composing music away, making the process enjoyable, if a little ridiculous.

3. Evaluation

Magenta creates Funk stems and audio well, but I would struggle to use the material generated in other genres or for another application. Perhaps with more experimentation I would be able to tailor the material created more to the styles of music I typically compose in.

4. Conclusions

If I was to compose another funk track, I would maybe use the Magenta Groove tool to enhance my MIDI drumbeats. Otherwise, this AI songwriting tool is not beneficial to the composition of my future songwriting portfolio.

5. Actions
Although, I enjoyed the songwriting process with this AI, I will not use it again.

Song 5 – 18th November – Amper AI "Mirror"

1. Description
I began this process by naming the track and choosing the duration of one minute and fifteen seconds, then choosing a base track from the existing pieces on Amper. I had the option at this point to change the instruments, key and section lengths, however I chose to keep them at the default. I then used These Lyrics Do Not Exist with the input 'mirror' to generate some lyrics similar to the original prompt "gazes met in a mirror, and he smiled at me". I chose the emotion 'happy' and the genre 'pop'. I composed the top line melody but left every other element as authentic to the AI material as possible.

2. Feelings
I felt like I'd cheated the songwriting process by choosing a pre-generated track and just adding a top line. However, it was satisfying to have an almost completed song so quickly. It made me concerned that if I was to use this song commercially, there is a possibility that others would use the same pre-generated track as therefore have a similar finished product.

3. Evaluation
Amper is a simple platform to use and its effective and quick at producing basic pop backing tracks, it is ideal for budding musicians who wouldn't be too confident using a DAW to create their music. However, I don't believe it would pass for the high-quality production standards that are found in the popular music charts. The export only allows for audio files rather than MIDI, so you are forced to use their instrument sounds, which are not necessarily the best quality or suit the genre best.

4. Conclusions
I would personally not use Amper again, but I see its validity and purpose for music creators who need a helping hand with starting to produce and write their own songs.

5. Actions
Don't use Amper again.

Song 6 – 30th November – Scaler 2 AI "Innocence"

1. Description
I began with the lyrics, using the AI GPT-3 text generator Bored Humans. This AI doesn't allow for input data so I couldn't use the phrase I have with the previous songs and the theme of the song is different to all the previous tracks. I randomly generated two separate lyrics and made a combination of the two for the final track.

With the lyrics compiled, I used Scaler 2 to compose and arrange a piano and string section. I decided to use Bb mixolydian as the key and chose a pre-determined chord sequence intended for a Future Bass track. I then used the melody generator in Scaler 2 to compose a melody and used the same chord sequence in various performances as the string section parts.

2. Feelings
I felt that this was the most unique and commercially viable song out of the six created, it made me happy that I had a finished product with an arranged string section fairly quickly compared to the time it would have taken to manually arrange the string section. The Bored Humans lyric generator is trained on poetry and so

3. Evaluation
Scaler 2 gives more in-depth options than the previous AI songwriting tools I've used, different scales, time signatures, genres and instrument sounds make it the most versatile software I've used so far. The lack of input for the lyric generator is frustrating as you would have to refresh and generate new lyrics to get a specific topic, however the lyrics that it creates are the best and most creative I've seen so far.

4. Conclusions
I would use both of these programs again, both separately and in conjuncture with one another. This song was the most creative and quickly completed out of the six I composed.

5. Actions
I will use these two AI models as the basis for the start of my songwriting portfolio, using Scaler 2 I can experiment with irregular time signatures and various modes and with Bored Humans my lyrics will have a wider range of topics.