



# Implementation of Electronics in Contemporary Classical Composition

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## ABSTRACT

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Throughout the ages, musical genres have evolved and fused together and at the center of this development is technological advancement. Composers spend decades innovating and furthering their craft, with the goal of creative expression. With the innovations of technology today, musicians and composers have unlimited access to creative extensions on their computers. This has resulted in endless variations of genres that all share a common feature: it has all taken primary inspiration from classical music.

The objective of this Bachelor's thesis was to explore the most notable influences and technological advancements that have allowed for the genre of modern classical music to become what it is today, as well as give the reader a concrete guide to start creating music with these influences. To truly appreciate the beauty of music and the creative process, it is vital to understand the history and the famous composers who helped craft it.

In addition to history and research, an Extended Play with two songs has been created to further explore the inspiration and production techniques discussed in this thesis. The works are a practical guide to the modern-day implementation of electronics and software in contemporary classical music. It is an efficient method of learning to understand both the theory and the concrete implementation. The reader may use this thesis as a starting point to start creating this genre of music.

Within this thesis, artists, influences and innovators have been discussed who have paved the way for modern musicians to follow and seek inspiration from. The central finding of this thesis is the sheer multitude of inspiration from all over the world, as well as the utilization of new creative tools and ideas.

Key words: classical music, music technology, creativity, composer, contemporary music

## TERMS AND ABBREVIATIONS

**DAW – Digital Audio Workstation:** The computer program used to arrange music and records music into.

**MIDI – Musical Instrument Digital Interface:** A form of data that sends note information to software and hardware instruments within a studio.

**Reverberation (reverb) -** An audio processor that simulates the acoustics of a space or a room. The use of reverb adds depth and space to a mix.

**Equalizer (EQ) -** An audio processing unit that can shape the frequency of a signal. Often used to make unfavorable frequencies quieter or pleasant frequencies more prevalent.

**Echo –** Used in tandem with Delay, Echo effects create copies of the original signal in various speeds and timbres, adding depth and space to a mix, much like reverb.

**Neoclassicism –** A cultural movement within a wide variety of arts that took inspiration from former classical works. In music, neoclassicism was the most prevalent from the 1910's until the end of the 1950's.

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## 1 INTRODUCTION

As the technology we utilize to create music rapidly evolves, artists are inclined to implement modern techniques into familiar soundscapes we have known for centuries. This has led into the development of a multitude of genres, that specifically draw inspiration from classical music and the traditional orchestra. These fusions that gather generations of musical innovation and combine elements that artists and producers have had access to for only 20 years, creating an ear-catching world of texture and expression offer the listener a combination of something we've come to know and love, but also introduces them to a new world of sonic opportunity.

This thesis will focus on the implementation of electronics into modern classical composition. This fusion-genre has been coined neoclassical (not to be confused with 1900's neoclassical) or contemporary classical. This thesis will also explore the key characteristics of traditional, minimalistic neoclassical composition styles and instrumentation (such as piano and strings) as well as the addition of electronics. This thesis will help in understanding the purpose behind these electronics, and where they draw their roots from.

This thesis will also create arguments as to why the genre definition of neoclassical are slightly flawed in the eye of the public, since the terms neoclassical and contemporary classical are used interchangeably within the modern composing landscape, even though their origins and definitions differ vastly.

While the music theory aspect of neoclassical music has taken a more minimalistic route in the modern composition, the sonic capabilities of these electronic instruments, Digital Audio Workstations and processors allow the composer to explore textures and harmonies previously unavailable for the mid-1900's composer.

This thesis will also help to bridge the gap between neoclassical, ambient and modern classical, and help to ultimately draw a map of musical history that leads to the modern-day genre. In addition, this thesis will introduce the reader to some of the key characters in this story of musical development. From classical composers such as Igor Stravinsky and Erik Satie to those who took inspiration from

these legendary composers, such as Brian Eno, to those who aspire for modern implementation and technical exploration with the additional technology like MIDI and MPE-controlled synthesizers. These artists include Nils Frahm, Ludovico Einaudi and Olafur Arnalds. In this thesis, the reader will learn how these artists paved the way for each other.

The media portion of this thesis explores these theory concepts, electronic production techniques and mixing practices to demonstrate the beginning-to-end process of creating music within this genre. The thesis Extended Play features the combination of live-recorded upright piano, as well as modern solo string sample-based instruments, to showcase the combination of samples and real instruments, which has become incredibly common within the genre.

This EP will help answer the questions of how a composer is able to implement electronics to create a deeper space, unique textures and complex musical patterns.

This thesis uses Artificial Intelligence to speed information gathering workflow during the writing process. Artificial Intelligence was also used to create summaries of the composers researched, as well as put the list of references in alphabetical order. Although creating music with Artificial Intelligence is becoming more popular, Artificial Intelligence was not used in the composition, arrangement, sound design or mixing stages of this EP. This thesis explores the implementation of electronic inspiration, not tools that create full compositions that the artist can then choose from. See DISCUSSION for an in-depth thought process on creativity and AI.

## 2 NEOCLASSICISM IN MUSIC

### 2.1 History of neoclassicism in brief

Neoclassicism in music is an important era of musical attitudes that were clearly defined as a counter force to the direction that classical music had been heading towards in the early 20<sup>th</sup> century (Awakened Soul Productions, 2023). It was considered a step in the direction of form and direction and a nod towards the roots of musical expression and minimalism, away from the freeform nature of Romanticism. The idea of less being more is what has carried the musical trend to this day. Neoclassical music developed in the 20th century in between the two World Wars. (Jones, d.a.)

The genre and its most notable composers sought to revive the term classicism in the world of music, which, from their point of view, had become too extravagant in its expression of emotion. Neoclassical composers therefore sought to minimize the expression of emotion and create a composition style of subtlety and minimalism. The key terms used today to describe neoclassical music include balance, order and emotional restraint. (Wikipedia, 2025.) It is considered a counterargument against the perceived lack of form and unrestrained expression of the later stages of Romanticism, an expressive time characterized by freedom and experimentation (Awakened Soul Productions, 2023).

What ultimately became the characterizing details of neoclassical were the emphasis on rhythm and tonal harmony, when the era prior took a less strict view on harmony with expanding modes. The sizes of the ensembles performing these compositions also became smaller, toning down the complete orchestra into smaller sections of musicians, such as quartets and octets (Jones, d.a).

It is of importance to note that neo-classicism was considered more of a trend and an aesthetic, rather than a complete musical era. A multitude of composers adopted the neoclassical aesthetic, while not being considered neoclassical composers. The term "neo" originates from the idea of a revival. When we use the

prefix, we are ultimately referring to an updated and developed version of something that the art is reiterating. Neoclassicals sought to revive the classical form and aesthetic, hence the use of the prefix.

### **2.1.1 Music theory concepts**

Neoclassical music theory heavily focuses on its key argument: Music we now refer to as romanticism has become too extravagant with its use of modes and confusing structures that seem to follow no specific form. The style was not a direct replica of the era of classicism, though, as it was also inspired by the baroque era, which was characterized by the strict form and creativity within the bounds. Alongside this, tonal harmony was expanded. (Pedromo, 2023.)

This aesthetic applies to music theory: clarity of structure, form, and a focus on artistic identity and melody were essential. Excessive ornamentation of music was seen as unfavorable. Each instrument, harmony and note has its own distinct place and reason. Contrapuntal writing is often featured in neoclassical works, especially piano pieces. This was a method for a composer of showcasing their mastery while maintaining musical minimalism. Furthermore, balance in harmonies was favorable, leaving dissonance and chromatic writing as tools used rarely and sparingly. (Pedromo, 2023.)

### **2.1.2 Rhythmical concepts**

In addition to the clear and elegant harmonic structure of neoclassical music, rhythm was also often well-defined and recognizable. A steady pulse of rhythm in the signatures of 4/4 and  $\frac{3}{4}$  were most used, while syncopation and poly-rhythms were used sparingly due to their nature of being unbalanced. Rather than the grandiose screams of emotion portrayed in romanticism, neo-classicism relies on poised, intellectual composition, while communicating emotional restraint

via musical minimalism. Prime examples of composers include Erik Satie and works by Igor Stravinsky.

## **2.2 Notable works and composers**

It is important to know the specific people and artists behind these world-renowned works that start genre-bending trends, that eventually would impact artists generations later. It is also important to take note of the physical environments of the artists to know their motivations, inspirations and struggles.

### **2.2.1 Igor Stravinsky**

Igor Stravinsky (1882–1971) was a Russian conductor and composer. He is known as one of the most influential names in the last 100 years and is also considered the lead character in neoclassical music (Oramo, 2020).

Stravinsky was born in Saint-Petersburg, where he studied piano. In his early work, he composed norm-challenging ballets, most notable of which, *The Rite of Spring*, nearly caused an alleged riot at its premiere in 1913 (Hewett, 2013).

Stravinsky's work can be divided into three eras. The Russian era, the neoclassical era and the serial era (La Phil, d.a). For this thesis, we will analyze his works from the neoclassical era, from 1920 until 1951, since it is the most relevant to the development of the genre in discussion. Stravinsky thought (perhaps ironically after causing a riot in a ballet premiere) that the Romantic Age in music had gone too far in the avant-garde, and that order, form and emotional restraint should be restored within music and composition.

Stravinsky's neoclassical era for the most part takes place while he is in France. It is often argued what his first neoclassical work was. Some consider the first of his works to be his *Symphonies of Wind Instruments*, while some argue it to be *Octet for Wind Instruments*, then followed by his *Concerto for Piano*.

Neoclassicism was not well received in France, especially since Stravinsky had been known for more extravagant performance. He himself said that he is not part of the movement. However, after the premiere of *Apollon musagete*, his first work, inspired by Greek mythology in 1928 and the beginnings of a collaboration between Stravinsky and choreographer George Balanchine, who was only 24 years old at the time of the collaboration. Finally, some critics described the work as a wonderful blend of neoclassical ideas and modern aesthetics. The height of his neoclassical work is considered by some to be *Oedipus Rex* from 1927. The work is described as work already seen with modern twists. (Cross, d.a.)

### **2.2.2 Sergey Prokofiev**

Sergey Prokofiev (1891-1953) was a Russian composer who created a wide range of genres, including symphonies, operas and film music. He was born into an agricultural family, and learned piano from his mother, who was considered skilled in the instrument. Prokofiev was a gifted youth, earning an Anton Rubinstein Prize from a brilliant performance of his first own Concerto, Piano Concerto No.1 in D-flat Major. Prokofiev was especially intrigued by the work of Igor Stravinsky, especially his ballets, though he sought to innovate, rather than replicate (Nestyev, Taruskin, 2025).

Prokofiev's work was impacted by the environment he was in. The USSR had strict requirements for what was created and published there. The USSR wished to remain beautiful, nationalistic and majestic. This drove Russian composers of the early 20<sup>th</sup> century, but did not stop them from adding subtle structural anomalies in their art. Inspired by his adventures in Europe, Prokofiev took the neo-classical style and created around it, expanding his creativity with the limitations he was given. He took inspiration from his time in Germany and the USA and added in dissonance and untraditional intervals and implied for oppression by using war-induced instruments, such as snare drums. His work may be described as sarcastic, through and through. (Valentine, 2020.)

### 2.2.3 Other notable works

If one was to seek inspiration from the famous works of this time, some works listed here are great places to start understanding the musical language of traditional neo-classicism.

- **Sergei Prokofiev** - Symphony No. 1 (1917)
- **Franz Liszt** - A la Chappelle Sixtine (1862)
- **Igor Stravinsky** - Octet (1923)
- **Igor Stravinsky** - Piano Concerto (1924)
- **Igor Stravinsky** - Oedipus Rex (1927)

## 3 AMBIENT MUSIC

### 3.1 History in brief

Ambient music is a minimalistic genre of electronic music that began between 1960-1970. The key characteristics of ambient are the focus on tonal atmosphere and long, evolving soundscapes, and usually the absence of a rhythmic structure. Its focus on texture is a driving factor and is often the most distinguishing and intriguing part of an ambient music piece to a listener (Landi, 2023).

Ambient is often described as peaceful, calm and soothing, although ambient music can very well be dark and brooding in nature, depending on the music theory and sound selection (Masterclass, 2021). Field recordings are often used in ambient music to skillfully craft a geological location or a time for the piece for the listener to take part in and is often the factor that best communicates the intention of the composer.

Unlike the vast history of neoclassical music, ambient music can be traced down to a specific composer, Brian Eno, with his 1978 work *Ambient 1: Music for Airports* (Eno, 1978). An inspiration for Eno and hereford, to ambient music as a whole is *Furniture Music* (*Music d'ameublement*), composed by Erik Satie in 1917. The music was far more minimalist than ever heard before, some describing it as ignorable, which, in fact was the exact purpose of the music (Marshall, 2025). The works were meant to be heard, not listened to. Music was never meant to be on the background, so this approach was outrageous to the people of the time. Knowing this, a far clearer path of development opens from neoclassical to ambient. Without these key characters, the genre would not exist in its current form. The inspiration has spun into a famous quote by Brian Eno;

*"It (ambient music) must be as ignorable as it is interesting"* (Eno, 1978).

Numerous ambient and new-age musicians have been said to draw inspiration from classical music. For example, French composer and musician Jean-Michel

Jarre said in a 2004 Guardian interview that he was heavily influenced by Igor Stravinsky's *The Rite of Spring* (Hodgkinson, 2004).

Today, ambient music is heavily influenced by its roots in the 70's. Though sub-genres such as liminal ambient have emerged in the 2020's, as a response to a feeling of nostalgia and isolation (mainly due to COVID) the composers try to provoke (Haven, 2025). Ambient music and its characteristics are also extremely prevalent in modern day film music, as soundscapes to be placed under dialogue and in b-roll footage. This style has taken over modern film music, moving from the styles of John Williams and John Powell, into the scores of Hans Zimmer, Vangelis, Ludwig Göransson and alike.

### **3.1.1 Erik Satie**

To bridge the gap between neoclassical music and ambient, we must understand the French composer Erik Satie and his work. Erik Satie (1866-1925) was an eccentric and outrageous character in his musical career and life. He began his musical career in the Conservatoire in Paris, where he would not display extraordinary talent, and would work at a cafe, playing the piano, while composing solo piano works such as *Gymnopédies* and the *Gnossiennes*.

Today, we know Satie best from *Trois Gymnopédies* (Three Nude Dances), which were released to the public between 1888 and 1895 and the *Gnossiennes* (Schwarm, 2025). The *Gnossiennes* depicted early forms of ambient by being meant to play in free-time, so not in any desired tempo.

Satie is known for musical minimalism and his solo piano work with repetitive melodies and unresolved chords. He is one of the composers we today consider classical, whose work resembles the classical music of today the most.

### 3.1.2 Brian Eno

Brian Peter George Eno (born 1948) is largely considered the father of modern ambient music. He is an English composer, artist, record producer and author. Eno is known as an enabler of unconventional ways to create art and has been an important character in the development of generative music creation (Britannica, 2025).

Eno studied experimental music and painting in Ipswich Civic College, and later in Winchester School Of Art. He joined the glam-rock band Roxy Music as a synthesizer player in 1971 and recorded two albums with them. He left the group in 1973.

In 1978, his notorious sixth studio album, *Ambient 1: Music for Airports* is released. The album is a monumental shift in experimental music. The album was created by layering tape loops on top of one another. The concept of the album was to ease the anxious ambience of an airport. Eno intended the music to be "as ignorable as it is interesting", coining the famous quote in the meantime. He got this idea from classical composer Erik Satie (Alsup, d.a). Since its release, *Ambient 1: Music for Airports* has received three sequels: *Ambient 2: The Plateaux of Mirror*, *Ambient 3: Day of Radiance* and *Ambient 4: On Land*.

In total, Eno's enormous discography features a staggering 29 solo studio albums, 22 collaborative albums, 18 compilation albums, 27 singles and nine EPs. He has also mentored and trained various famous musicians of today, most notable of whom is likely to be record producer and musician Fred Gibson, known as Fred Again. He has also collaborated with various musicians, including David Bowie, U2 and Talking Heads (Southbank Centre, 2023).

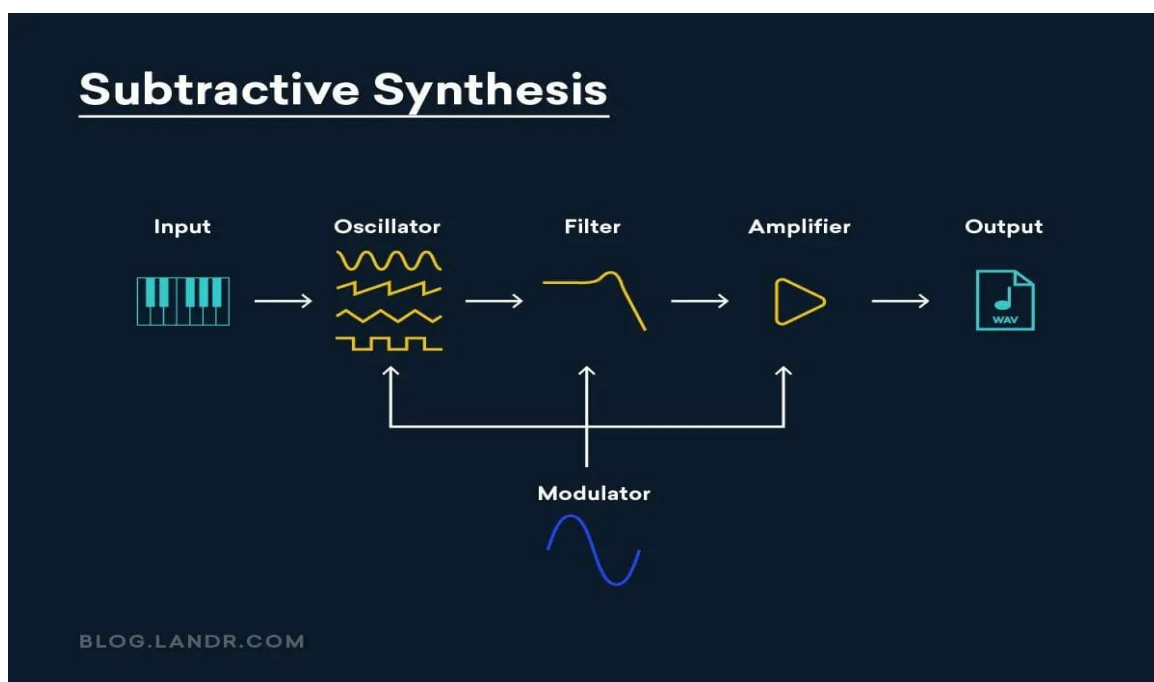
## 3.2 Ambient music production

The creation of ambient music differs from the composition of traditional recorded music in the fact that it blends the processes of production and composition (Mes-

sitte, 2022). Having access to production techniques that expand on the composition of the piece blurs the lines of when musical ideation ends and the production process begins. There are fundamental stages of creativity we can investigate to start creating ambient music. We will go into a few of these stages in this chapter.

### **3.2.1 Synthesis**

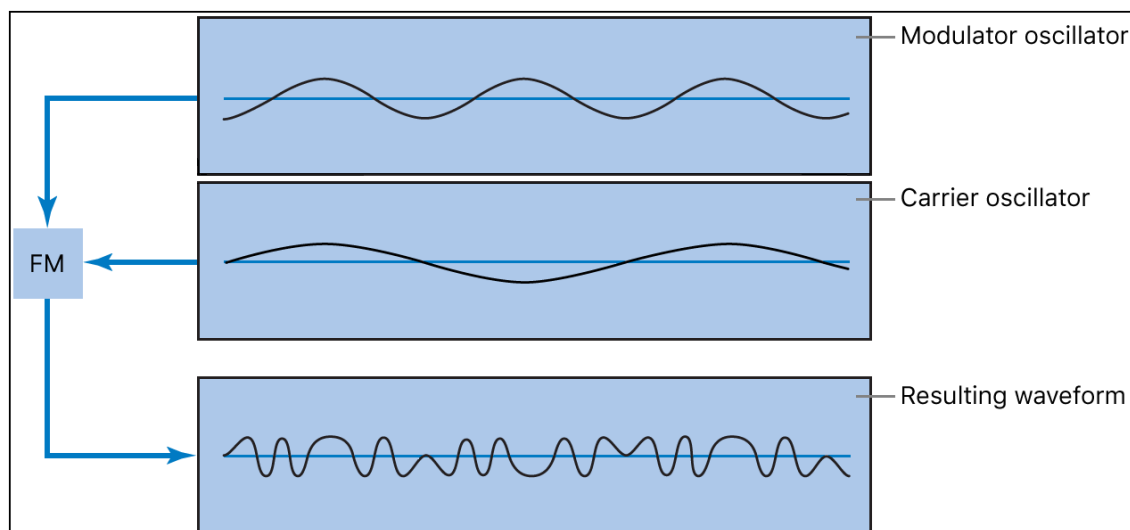
A fundamental part of ambient music and its charm is the use of electronic instruments. With synthesizers we can create sounds that extend on the natural playing capabilities of instruments and increase the timbres available to near infinity. The opportunity to create nearly endless pads of musical information and then stack them on top of another with time is a powerful tool of musical storytelling. (Golden Scissors, d.a.) The popularity of synthesizers cannot be limited to one specific product, but some of the instruments that became standard in the genre were the Juno-60 produced by Roland and the Yamaha DX7, the first major hardware synthesizer to feature Frequency Modulation (FM) synthesis (Lavengood, 2025). A cornerstone for synthesis in general is the use of subtractive synthesis. This is especially prevalent in ambient music, as the subtraction of especially high-register frequencies gives the sense of softness and distance in sound design.



PICTURE 1: Image depicting the signal path of a subtractive synthesizer (Picture: LANDR)

In subtractive synthesis, we use harmonically rich waveforms, such as the square wave and a saw wave and subtract frequencies using the filter. This allows us to shape the sound, as well as move the filter over time to add movement and texture at will. This technique is present in essentially every synthesizer available. This technique was the driving force of the first synthesizers composers used to create ambient music. Since then, there have been numerous innovations in methods of synthesis including AM (amplitude modulation, first used in radios), phase modulation (PM) and additive synthesis just to name a few (Connaghan, 2023).

In 1983, a new form of synthesis found its way into the mainstream studio. Yamaha released DX7, the first digital instrument that was commercial success. It was popular in pop music but found its way into ambient music as well. Artists like Ryuichi Sakamoto utilized the DX7 and its complex user interface to create sounds in the 80s. Frequency Modulation synthesis relies on two separate waves: the modulator wave and the carrier wave. The modulator wave modulates the carrier wave, creating new harmonics and resulting in a unique result.



PICTURE 2: Modulator and carrier waves creating the resulting waveform in FM synthesis. (Picture: Apple)

When there is a mathematical relationship between the modulator and the carrier, the resulting sound is harmonic (Apple, d.a). Traditionally FM synthesis creates sounds that are metallic and brassy.

Today there are essentially limitless methods of combining synthesis methods. Even in one synthesis patch, it's possible to incorporate multiple methods to create sounds that were simply unavailable when synthesis first gained popularity. Software synthesizers such as Phase Plant by Kilohearts and Serum by xfer Records allow for never seen before synthesis opportunities.

### 3.2.2 Sampling

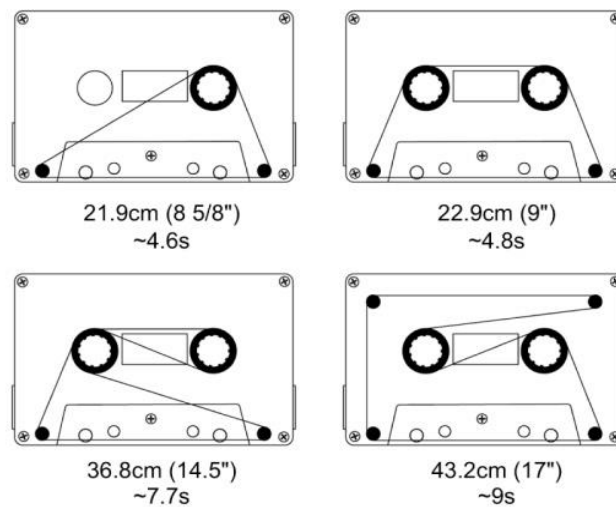
Modern day ambient music features a multitude of sampling techniques to achieve supernatural spaces on the other end, and on the other, familiar and grounded ambience, such as forest sounds, city ambience and walla (Gillespie, 2023). The ambient composer of the 2020's has an unlimited array of audio to select from on the internet to create however they choose. Most musicians choose to personalize their works, though, and record their own sound sources, to create authenticity and personality within the music. For sampling their environment, a Zoom H-series field recorder is a go-to for a lot of ambient enthusiasts.

For someone looking for a quick solution, the internet is full of websites such as Splice.com, Freesound.org and Soundly.com. Composers will then take these samples and implement their own flavour to it within the DAW, adding effects such as reverb, tape echo, delay, filtering and in some cases, create an environmental instrument by adding tonality via a resonator. Oftentimes the sound sources would include synthesizers that would then be "sampled" into tape machines and reverberation and delay units. This creates a lush but warm world of ambience and artifacts. A prominent character in the history of sampling is the French composer Pierre Chaeffer, who experimented with an early form of sampling, known as "musique concrete", coined by himself (Young, 2012).

### **3.2.3 Tape**

An aesthetic loved by ambient musicians is the physical imperfection created by physical sound reproduction methods. Tape and tape loops are a creative way to add artifacts to sounds that reflect nostalgia and creativity that brings the artist and the listener back to the roots of sound design (Motion Soundscape, 2024). Tape loops are great to create organic rhythms and textures, as well as timbres. In tape loops, a part of a magnetic tape is cut and attached to itself to create an endless loop of sound. Layering tape artifacts on top of itself, the original sound will eventually get buried under them. The feeling communicated with tape loops is often related to nostalgia. Combined with echo, delay and reverberation, this has been an ambient musician's staple.

## BASIC TAPE LOOPS



Standard cassette tape speed: 4.76 cm/s (1 7/8" per second)

This work is derived from [https://www.reddit.com/r/tapeloops/comments/9qf8b/basic\\_tape\\_loops/](https://www.reddit.com/r/tapeloops/comments/9qf8b/basic_tape_loops/)

PICTURE 3: The basic tape loop setup shown from inside the tape cassette. (Picture: Motion Soundscapes)

### 3.3 Ambient music mixing

The mixing of ambient music is an avant-garde artform. Since the sound sources are often otherworldly and larger-than life (such as synthesizer pad sounds and heavily processed ambience), the rules or traditional mixing techniques do not apply to computer-based ambient music (Computer Music, 2022). Most commonly though, composers seek to achieve a sense of depth and separation within their elements, allowing for them to be distinguishable. Other creative effects, such as filters, creative distortion units, grain delays.

#### 3.3.1 Reverb, Delay and Echo

Reverberation, Delay and Echo and other processors focused on depth are often the cornerstone of an ambient mix and are usually a key element in the sound

design process as well (Messitte, 2022). Traditional room and plate reverbs are less likely to see their place, as they will be overshadowed by lush halls and larger-than-life spaces. A common resource for these sorts of reverbs comes from guitar pedal reverbs, most popular of which has been made into a plugin due to its popularity.



PICTURE 4: Blackhole by Eventide Audio. (Picture: Eventide Audio Blackhole Product Page)

Another classic effects unit to be used in ambient is the Roland Space Echo RE-201. Due to its large price tag, there have been multiple emulations made for the unit. The sound of the unit is especially nostalgic, since the output is mono. This allows users to run the signal multiple times to get a different result and afterwards panning the audio to create a stereo image with the tone and timbre of the Tape Echo.



PICTURE 5: Galaxy Tape Echo plugin by Universal Audio. (Picture: Universal Audio)

### 3.3.2 Filtering

Often with long, stagnant elements, it is vital to add interest and movement to ambient compositions. Subtracting and adding frequencies over time is a fantastic tool for creating this sense of movement and progression. The filters of hardware units are valued for their personal frequency responses and their abilities to add a harmonic series to the sound (Universal Audio, d.a). Notably the filter of Moog-series synthesizers is notoriously sufficient at adding these harmonics. Due to its distinctive sound, the Moog filter has been recreated multiple times in digital form.



PICTURE 6: Moog Multimode Filter XL by Universal Audio. (Picture: Universal Audio product page)

### **3.3.3 Equalization**

Equalization is largely used as a tool to place and fit sounds within a mix, while the tone-shaping process is largely handled by coloring filtering. Equalization will therefore be used to make sure sounds don't clash within the frequency spectrum and that each element of the mix has the space assigned to it. Ambient music is about movement within space and time, so ensuring that every single sound has distinct space at specific times, we greatly increase the quality of an ambient mix.

## **4 MODERN IMPLICATION**

### **4.1 Contemporary Classical**

We have now discussed the inspiration and influences on the modern-day genre of contemporary classical music, and we will now begin the process of defining the genre in its current state. We will touch upon the definition of this genre, as well as the defining features of what makes this genre recognizable. We will touch upon instrumentation and music theory concepts, as well as the most influential modern composers of the genre, who innovate, expand on and create new boundaries in the modern day.

#### **4.1.1 The problem of genre definition**

As we discussed previously, the trend was largely a reaction to the musical aesthetic of the times, longing for the orderly fashion of classicism and baroque.

It is thought to be inherently faulty to define the modern classical composition with the same name as the works of Stravinsky and Prokofiev, since the genre we refer to as neoclassical is rather a fusion of a vast number of influences, ranging from ambient music into popular, and even film music. Therefore, a more suitable term is contemporary classical. The term acknowledges the influences of neoclassicism while not confusing the listener and not staging itself as a musical rebellion against an era of music long gone (Wassenberg, 2024).

When we inspect the wide variety of contemporary classical music, we notice a far clearer movement from neoclassical to contemporary classical. As the age of neoclassical started to die down after the second World War, European and American composers began to experiment with their own styles. In Europe, composers began experimenting with serialism. Arnold Schoenberg and Anton Webern coined the Twelve-tone technique, which states that all 12 tones of the chromatic scale appear equally within a piece of music (Lumen learning, d.a). This

inherently causes the music to not establish a key. This style of composition was opposed by the likes of Dmitri Shostakovich, maintaining their own tonal style of composition.

In the US, composers such as Philip Glass and Steve Reich began a new age of experimental music, which experimented with the ideas of basic principles, such as form, performance, duration and notation (Jacobs, 2013).

Inbetween the 1970's and 1990's we face large technological advances in music gear and equipment, making electronics widely available to composers and musicians (Hogan, 2016). Elements from ambient electronic music find their way into contemporary classical composition and with the incredibly diverse sound palette of analogue synthesizers combined with digital processors, the sonic capabilities of music still vaguely defined as classical expands into countless directions.

With the introduction of sample-based virtual instruments, composers can create full scores without hiring musicians, making it more affordable and attainable than ever before (Salmi, 2018). In addition, the contemporary classical style shares a lot of the same key characteristics as modern film music. Contemporary classical composers often steer in the way of film composing as an addition to their own works.

#### **4.1.2 Modern genre influences**

Due to the internet and nearly infinite inspiration available, modern classical music has been affected by countless genres and influences, the most prevalent being the values and aesthetics of neo-classical music and the soundscapes of ambient and new-age music.

Modern classical music is a chameleon genre. It can transform into a multi-purpose aesthetic rather than a strict definition of a genre. It is audible that modern classical makes its way into genres including but not limited to pop, electronica and film music. Especially during the era of music streaming neoclassical piano or calm piano, where often a felt piano is recorded close-up, and a simple motif

is presented in a 2-minute piece have become an almost subgenre of modern classical music. (Klangspot Recordings, d.a.)

The genre also takes influence from endless generative machines and algorithms. As discussed later, Olafur Arnalds utilizes motorized self-playing piano, feeding MIDI data into them, creating a cloud of generative piano notes (Composer, 2018).

Many composers also take the modern classical aesthetic and apply it to multiple uses, such as vocal pop ballads, calm electronica beats and metal.

### **4.1.3 Music theory concepts**

Modern classical music is often distinguished as more simple, slow and based on texture, rather than the complexity of music theory concepts. Unlike during the neoclassical era, where tonal concepts were favored, modern classical music has no clear theoretical standpoint. This also has to do with the fact that the genre has a very wide base of creators, each of whom will create their own rulesets. (Nahre Sol, 2025.)

Modal and tonal harmony are both utilized, although atonality and 12-tone techniques are less common due to the genre usually being meant for calm, relaxing or melancholic ambiances with clear harmonic structures. Techniques for establishing a home-key are often used. Choices, such as the use of pedal notes are considered to establish the root key of the piece, while the melodies and harmonies can move more freely.

Harmony is also considered a more linear process, rather than blocks of chords. This means we can get more musical information via rhythm and texture instead of playing thirds on top of one another. Sometimes a piece will consist of only a chord progression played in a lively, rhythmic manner.

## **4.2 Contemporary classical instrumentation**

Today, the creativity of the modern composer is not limited to the traditional instruments found in orchestras. Virtual instruments, sampling and audio manipulation have made it possible to create nearly any sound imaginable (Salmi, 2018). This is what most composers opt for. While respecting the traditional instrumentation of piano and strings, they expand on the ideas and timbres laid down by our predecessors by adding digital processing units and MIDI-generation methods into modern composition.

### **4.2.1 Sample-based virtual instruments**

One of the defining inventions for musicians in the modern day is sample-based virtual instruments. They have allowed composers to assign MIDI data to a full orchestra from a computer and get a realistic response. This has allowed a new generation of composers to explore the occupation without having to pay for a full orchestra, along with the ability to change any note at any time. (Salmi, 2018, 4.)

This has enabled modern classical music to bloom and take as many forms as it has. Without the wide availability of virtual instruments, software synthesizers and mixing tools, the genre would not be as fluid and expressive as it is.

All a composer will need in terms of sample-based virtual instruments is an orchestra, a piano and a synthesizer (which all DAWs have built-in) and it is possible to create a sketch of a score. This doesn't come without its relative downsides, though as now an artist will have to work harder and smarter to create a unique sound that will make their compositions notable. This is why composers, if possible, will still hire real musicians to record. But for a starting composer, the situation has never been more encouraging and enabling.

### 4.2.2 Piano

For most composers, the piano is still the cornerstone of their composition. It is common for sketching an idea that will then be voiced for a string ensemble or orchestrated for a full brass section. Solo piano is also usual for modern classical composers, and thus it is of vital importance that the sound and the theoretical choices made by the piano are of quality in any given composition.

The piano is a foundation for many musicians. It allows for extended harmony and fast sketching and is full of character via miking techniques and the addition of felt. A modern classical music trend popularized by Olafur Arnalds and Nils Frahm includes using the Celeste pedal (or adding your own material between the hammer and the strings of the piano) (Brooks, 2021).



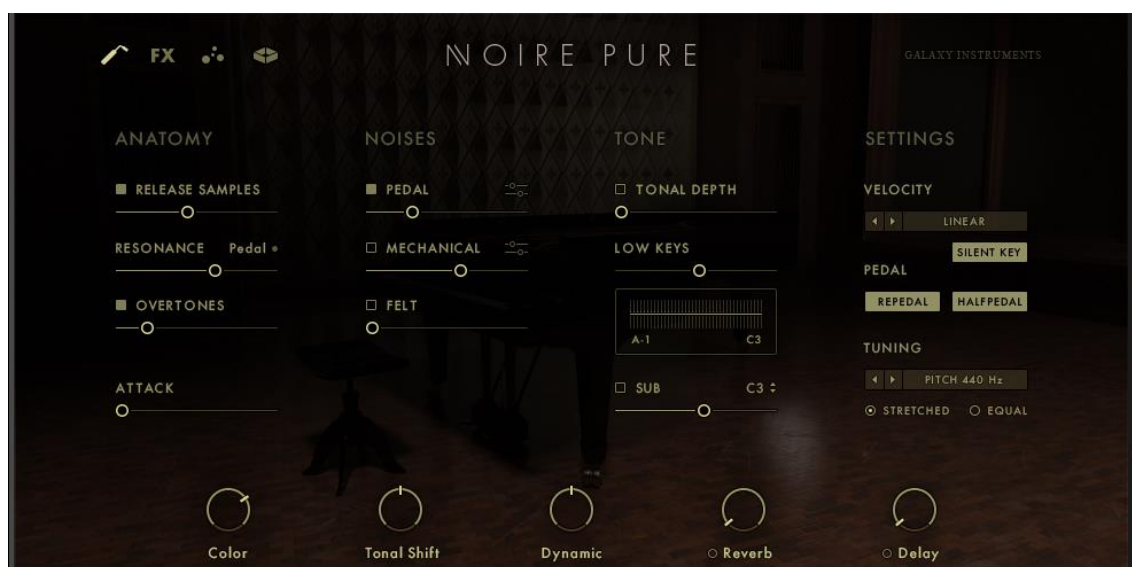
PICTURE 7: Basic miking technique of a felted upright piano. (Picture: Musictech)

This allows for an intimate, muted sound, that's warm and detailed. Combined with closely spot-miking the piano, usually with ribbon or condenser microphones, we achieve a homely, calm sound that many modern composers are after (Vacher-Coponat, 2024). The close miking of the strings also allows the engineer to capture the mechanics of the piano. The movements of the hammers, the keys

and the thumping of the pedal are details and imperfections that craft unique pieces of music and establish that the uniqueness of the instrument. After all, each piano has its own imperfection.

These details are so sought-after that some SBVIs come with the possibility of added noise, breathing, or mechanics. One of the most popular piano-sample libraries is Noire by Native Instruments, created in collaboration with Nils Frahm. It comes with three instruments; a pure grand piano, a felted piano and a creative, sound-design oriented patch (Native Instruments, d.a).

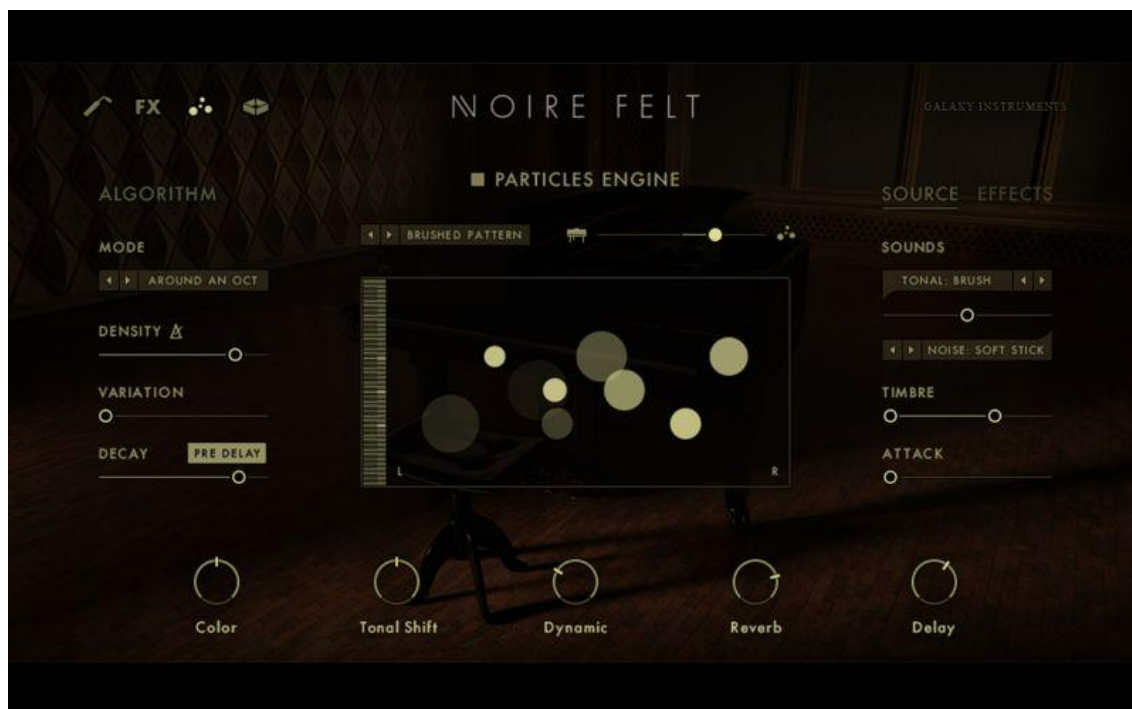
As seen in PICTURE 8, the settings page has various options for details to be added to the sound. You can increase the loudness of the pedal movements, the mechanics of the piano, such as hammer movement and the volume of the felt. This means that the hammer hitting the felt will be more obvious in the transient of the note. In addition, it is possible to change the tone, release value, overtone series, attack and many other parameters inside the sample-instrument, allowing for nearly endless creative possibilities for composers looking to personalize their piano sound.



PICTURE 8: Native Instruments Noire Effects Page. (Picture: PianoClack Forum)

Noire also features a generative engine called Particles. Within the engine, you can dial parameters to respond to your MIDI input by putting out generative piano textures. This can be an especially powerful tool for composers looking for

creative ambience via echo effects or just inspiration. It is possible to dial timbre, density, pitch variation, loudness and the attack of the generative piano response.



PICTURE 9: Native Instruments Noire Particles Engine. (Picture: Rekkerd)

Tools such as Noire create an opportunity for limitless creativity and expression, which is at the core of modern classical music.

Other popular piano virtual instruments are the Woodchester Piano by Fracture Sounds, the free LABS Soft Piano by Spitfire Audio and Una Corda by Native Instruments.

### 4.2.3 Strings

Strings are a widely utilized category of instrument in modern classical music. The expression of sustained strings is a complementary feature to the pianos percussive nature. With strings and piano together, we can achieve the bulk of the sounds and capabilities of modern classical music.

The string section is separated into four instruments: violin, viola, violoncello and the double bass. In neo-classical music, a full string orchestra or a large ensemble would be used to play these pieces, but in keeping with the minimalism of modern classical music (partly inspired by ambient music), the genre often utilized a quartet of strings, consisting of violin 1, violin 2, viola and a cello. This ensures we can play extended harmonies with the string parts, without having the grandiose sound of a full section or an orchestra (Lumen Learning, d.a).

This ensures minimalism and allows for a recording of detail in the string, if we want to utilize bowing techniques such as Sul tasto, col legno, flautando and playing harmonics. String techniques are a fantastic way to get more out of an already expressive set of instruments.

When it comes to string techniques, Sul Tasto is an effect that requires light, rapid bowing slightly over the fingerboard. The resulting sound of a Sul tasto technique is very intricate, soft and muted. Related, is the harmonics-technique. This allows the player to play the harmonics of the string instead of the fundamental tone. They are pure and flute-like and produce a high, soft sound. (Black, Gerou, 2009, 2.)

Staccato is a playing technique, where the bow begins and remains on the string with a clear separation between notes. Pizzicato is another common technique where the string is to be plucked, not bowed (Black, Gerou, 2009, 3).

### **4.3 Notable artists**

The aspect that keeps a genre alive and evolving is the artists that create it. Artists that hear what's already in the world and inject their own inspiration and taste into the art, breathing new life into it and thus, keeping it alive and growing. In this chapter are just a few of the most famous current names of the genre of contemporary classical music and their most notable works.

### 4.3.1 Ludovico Einaudi

Ludovico Einaudi is an Italian composer and pianist born in Turin in 1955. His style can be described as minimalist, calm, ambient and lively. Einaudi is a popular character in modern classical and contemporary media, having composed music for films and having his music used in TV-shows.

Einaudi studied at the Conservatorio Verdi in Milan. He was first introduced to composition and orchestration by his teacher Luciano Berio. With a diploma earned from studying, he travelled with his teacher and learned to collaborate with world musicians. His career has since ranged from traditional chamber orchestra compositions into ballets and soundtracks. He released his debut solo piano album in 1996, titled *Le Onde*. Since, he has released a multitude of albums, composed several media projects and has had his music placed in film and television shows. (Ludivoci Einaudi, 2023.)

In 2009, Einaudi released his album, *Nightbook*, which was a turning point in his stylistic choices. This album features synthesized ambient sounds to emphasize the mood of the piano pieces. his combined his delicate style of piano and a world of texture with synthesizers at the forefront. In addition, the album features sampled and edited percussion, which takes Einaudi's work into a more sample-based work, combined with the organic piano and strings. *Nightbook*, is therefore at the foreground of modern classical music, and an excellent listen for someone to discover Einaudis work.

Einaudi's most notable album, however, is released in 2013. The album is titled *In a Timelapse*, featuring 14 songs with various artists. It would be the 12th song on the record, *Experience* to reach massive popularity with over 500 million streams on Spotify alone. *Experience* is a notably beautiful piece for piano and strings, also featuring harp. The song, theoretically is a simple piece, consisting of mainly arpeggios along with the main piano line and string voicing. Einaudi's *Experience* is a beautiful example of the minimalism and the less-is-more-mentality of modern classical music. There are not many elements, and the themes are repeating throughout the piece, but the quality of elements are exceptionally

well thought out and crafted. Einaudi has received criticism from this minimalism though.

Critic Ben Beaumont-Thomas wrote in Guardian: "Einaudi casts himself as the antithesis to the stuffy conservatoire—but then plays music that is less adventurous than your average indie band's". He is also called a mediocre pianist, and his melodic themes are far too simple. (Beaumont-Thomas, 2016.)

This sort of backlash is commonly heard about modern classical composers, who prioritize listenability, texture and the quality of expression over the complexity of theory.

#### **4.3.2 Max Richter**

Max Richter is a German composer born in 1966. More so than Ludovico Einaudi, Richter is recognized as a contemporary classical composer. His solo work expands over 10 albums, some of which have gathered large mainstream success, with some of his solo works getting placements in various massive television shows and films, such as HBO's *The Last of Us*, *Arrival* (directed by Denis Villeneuve) and *Shutter Island* (IMDB, d.a).

Richter grew up in Bedford, United Kingdom, where he studied composition and piano at the University of Edinburgh. He then studied in the Royal Academy of Music as well as under Luciano Berio, who also taught Ludovico Einaudi, in Florence. Richter has worked with multiple renowned contemporary classical composers and artists, such as Brian Eno, Steve Reich, Arvo Pärt and Philip Glass. Richter shared their values of minimalism and contemporary exploration and experimentation, so he co-founded Piano Circus, an artist collective focused on these core principles.

Richter's solo work has garnered praise from listeners and critics alike, with his debut solo album *Memoryhouse*, released in 2002, recorded with BBC Philharmonic Orchestra, described as a landmark in contemporary classical music.

Richter is passionate about human rights and history. This is evident from the praised album, as his work are referring to world-famous events and tragedies, such as the Kosovo conflict and Laika, the astronaut dog.

Pitchfork reviewed the album and described it in a review: "In 2002, Richter's ability to weave subtle electronics against the grand BBC Philharmonic Orchestra helped suggest new possibilities and locate fresh audiences that composers such as Nico Muhly and Michał Jacaszek have since pursued. As you listen to new work by Julianna Barwick or Jóhann Jóhannsson, thank Richter; just as Sigur Rós did with its widescreen rock, Richter showed that crossover wasn't necessarily an artistic curse". (Pitchfork, 2014.)

His widespread success had not come to its peak, though, as he released his second solo album, *The Blue Notebooks* in 2004. This album included his most famous piece to date, *On the Nature of Daylight*, which was featured on famous films such as Martin Scorsese's *Shutter Island* and Denis Villeneuve's *Arrival*. *On the Nature of Daylight* is yet another example of strong musical motifs expressed through a minimalistic frame of composition. The individual performances are outstanding, emotional and every note tells its own story. The musical ideas are not complex. The execution and attention to detail are what make *On the Nature of Daylight* an essential piece in modern classical music.

### **4.3.3 Nils Frahm**

Nils Frahm (b. 1982) is a German composer of the modern classical, electronic and ambient aesthetic. He combines electronics and grand piano with mostly programmed percussion. Frahm is considered a household name in the realm of modern classical, as his sounds expand our understanding of contemporary classical works. Frahm's career is extensive and runs extremely deep. Frahm has released a staggering 16 solo albums, seven EPs, two compilation albums and numerous collaboration projects. The first internationally acclaimed work by Frahm was his first studio album *Felt*. (Nils Oliver Frahm, d.a.)

In addition to his musical releases, sheet music books and scores for theater, Frahm has worked closely in the software world. In 2014, Nils Frahm collaborated with piano-maker David Klavins to create Una Corda, a unique, portable upright piano instrument, which only had one string per key. Later, Frahm collaborated with Native Instruments and Galaxy Instruments to create Una Corda, a virtual instrument library that gives Una Corda to everyone via digital download.

Frahm collaborated with Native Instruments for a second time, this time introducing Noire, Frahm's now infamous concert grand piano with three different options; Felt, Pure Grand and a sound design-oriented Particle engine.

*"I'm interested in how human beings react in certain situations, and what music does to people's emotions. How we can change people's attitudes with tones. After I've played a good concert, people leave the room happy. This is something we can give back to the world. When people feel down and like it's all going to shit, at least we can give them some music and change their attitude, so people don't think it's all shit... That's my religion". (Bath, 2013.)*

#### **4.3.4 Hania Rani**

Hanna Raniżewska, artist name Hania Rani, is a Polish pianist and modern classical composer born in 1990. Her musical style features solo piano work, synth-based ambient work and some vocal tracks (Hania Rani, 2023).

Rani studied music at Nowowiejski Music School in Gdansk and later at the Fryderyk Chopin University of Music in Warsaw. She trained as a classical pianist, later incorporating jazz and electronic flavours into her music. Rani released her debut album *Esja* in 2019 and has since created a name for herself and her style in the modern classical world. The debut album earned her four Fryderyk awards, which, for a debut album is extraordinary. Her next stepping stone comes in 2020, when she released *Home*. An album that incorporates synthesizers and vocals, cementing her style into what we can hear today.

Her album, *Ghosts* is a staple for modern classical composers, as it blends electronics, piano, strings and vocal work, creating this seemingly endless world of opportunity and inspiration. In total, Hania Rani has released seven albums, that are essentials in the modern classical realm.

#### **4.3.5 Olafur Arnalds**

Olafur Arnalds (b. 1986) is an Icelandic composer, record producer, multi-instrumentalist and pianist. His style combines piano, strings, synthesizers and programmed percussive beats into a cohesive but intriguing soundscape.

Arnalds has scored several five studio albums, three collection albums and several film & tv soundtracks including *Another Happy Day*, *Surface* and most notably, *Broadchurch* (Erased Tapes, d.a). Arnalds started his musical career in punk bands. He was a drummer in various bands, including *Fighting Shit*, *Celestine* and others.

Arnalds got his start into modern classical music by collaborating with metal band *Heaven Shall Burn*. The band commissioned Arnalds to write classically inspired intros and outros for their album. The album received widespread success and Arnalds was asked to compose a full album of such composition. In 2007, *Eulogy for Evolution*, Arnalds' debut album was released.

That year, Arnalds toured with *Sigur Ros* and *Heaven Shall Burn*.

The first time Arnalds incorporates vocal work on his album is in February of 2013, when he releases *For Now, I am Winter*. The album features singer-songwriter *Arnor Dan* in four tracks, who Arnalds collaborated again on *Broadchurch*.

In 2018, Arnalds releases *Re:member*, an album that would define and expand the roots of modern classical music. Arnalds collaborated with *Halldor Eldjarn*, a software developer and audio engineer to create *Stratus*, an algorithm that allows Arnalds to play his piano and get a response via MIDI from two motorized self-playing pianos. The software would send a generative version of the MIDI input to two self-playing pianos, creating an inspiring "piano-sprinkle". The sound of *Stratus* was used all over *re:member* and dominated the modern classical landscape for years. In 2020, Arnalds created *Stratus*, a software SBVI in one of his

multiple collaborations with British company Spitfire Audio, allowing for Stratus' sound be available to everyone.

In the same year, Arnalds released his fifth studio album, *some kind of peace*, earning Arnalds two Grammy-nominations for *Loom* (feat. Bonobo) and *The Bottom Line* with singer-songwriter JFDR (Grammy, d.a).

In 2009, Arnalds paired up with Icelandic record producer and composer Janus Rasmussen to create supergroup Kiasmos, which incorporates modern classical strings and piano with modern but organic techno rhythms and synthesizer lines. Their self-titled album, *Kiasmos* was released in 2014, and they have since released multiple EPs and another album, *II*. Kiasmos is an example of modern classical sounds being used in unison with modern electronic music, drum programming and synthesizers in a dance context.

## **5 THESIS EXTENDED PLAY**

The media portion of my thesis is the creation of a three song Extended Play utilizing the techniques I've discussed within this thesis and drawing inspiration from the numerous artists I've researched and referenced during the making of this thesis. What follows is a practical overview of my full process. I will discuss the tools, techniques and thought processes I use to create this genre of music, as well as the mixing process to polish the sound to a release-ready product.

### **5.1 Tools overview**

The core of the tools I use to create music include my felted upright piano, Korg MS-20 Mini and Korg Minilogue XD. With this hardware I ideate and create rough sketches of ideas that I then record into my DAW, Cubase 14, to expand and further harmonize, arrange and design.

I record my upright piano using a pair of Rode NT5-condenser microphones in an A-B- microphone pattern. This is essentially the most basic microphone setup you can use, while still retaining the detail and stereo quality. My piano includes a celeste pedal, which lays a felt-fabric between the hammer and the strings of the piano. This allows for a warm, muffled and muted sound. That combined with the fact that the Rode NT-5 stereo pair was placed roughly 10 centimeters from the hammers, we end up with a warm, hyperrealistic sound that is familiar from numerous contemporary classical composers.

### **5.2 Composition**

From a composition perspective I wanted my songs to be simple enough to follow and for me to play consistently. I followed the traditional neoclassical rules of functional tonal harmony and improvised based on several chord progressions that are popularized by popular music and rock. These basic chord progressions work with the ideas of simplicity as well as the idea of tension and release and

they take inspiration from the genres that ambient music added large amounts of inspiration to.

I used lots of key-defining techniques within my compositions, most notably a pedal note usually being held by a synthesizer playing at a high register. This keeps the listener's feet planted within the confines of a key but allows for harmonic movement around it. I especially enjoy using my bass instrument to create more movement and harmony, rather than just playing root tones of chords. I find pedal notes to take inspiration from chant music, which I enjoy.

### **5.3 Recording**

I record my Fazer upright piano with a pair of Rode NT-5 microphones, set up in an A-B stereo pair technique. The microphones are roughly 30 cm apart and 10cm from the sound source. While recording in an acoustically untreated room and while creating music with the piano at its center, it's great to record instruments close to minimize room tone and increase the level of audible detail. In the recordings, the personality and uniqueness of my piano is audible with the sounds of hammers, mechanics and strings moving and creating anomalies within the recording. Traditionally, our goal would be to minimize sounds that are not added to the musical narrative, but in this case, we appreciate the imperfections, the warm detail and expression our tools offer us.

### **5.4 Mixing and mastering**

In this genre, production and mixing are two processes that are closely intertwined. The creative use of mixing effects as a sound design tool is a key process to give this genre its distinctive space and atmosphere. I often design my sounds with reverberation, echo and creative delays, which sometimes go through filtering, compression and other audio manipulation techniques.

I often use software synthesizers such as Serum by xfer Records and Phase Plant by Kilohearts to route the source sound through these audio processing units, as well as choose the order of these units. This way I could compress reverb tails into the sound itself without the sound ever leaving the synthesizer patch. After processing in such a way, third party processing is usually unnecessary. The sounds could be directly routed into the general auxiliary reverberation and delay, that are specifically meant for mixing and space design.

The mixing of the piano is similar in each song, as the microphone positions remain the same. I can therefore have one simple processing chain to make the piano sound coherent throughout the EP: The processing includes corrective EQ with FabFilter Pro-Q3, additive EQ with Brainworx MAAG-EQ2 and Universal Audio LA-2A.

From this processing chain the piano is routed to a send/return reverb track with UAD Capitol Chambers, Echoboy by Soundtoys and Blackhole by Eventide Audio.

For the processing of the synthesizers, I focused more on creative processing than traditional corrective mixing techniques. This included using reverberation and echo as creative sound design tools rather than mixing necessities.

As for mastering, it is simple. My mastering processing chain was similar in each song, since the music is similar throughout the project and I wanted to maintain coherence from song to song. I began with Ozone 8 by iZotope, adding the Maximizer and the intelligent dynamic equalizer. After Ozone 8, I added Soothe2 by Oeksound to tame resonance that might build up in the middle area of the frequency spectrum. After these procedures, I use 1-2 instances of Fabfilter Pro-Q3 to dynamically reduce problematic clashing frequencies from the mix. This process highly depends on the tones and timbres of synthesizers and strings from song-to-song. Finally, to achieve commercial loudness, Pro-L2 by Fabfilter is my choice of limiter to end the mastering process.

## DISCUSSION

During the writing of this thesis, I've made various discoveries and found new ways to connect musical history together. I've found it extremely rewarding to be able to create and study the genre for months and years but still be able to dive deeper into its intricacies and find new connections and paths of influence from artist to artist. These influences go past generations of musical development. I've also come to notice that while the environments in which we create change vastly, from central-European conservatoires to bedroom studios, the values of expression, minimalism and emotional load still carry on throughout the years.

With this thesis I've hoped to help the reader find the connections of history as well as the practical advice insightful and inspiring. Music is an artform, where I believe it to be a vast pool of influences we choose from subconsciously every time we begin the process of creating. The great artists from Stravinsky to Richter all have their own personal set of predetermined values, aesthetics and taste. And from this taste, they create. To feed their own creativity, not to create exactly what others want them to create. The people I've discussed here are innovators and their work should be consumed as such. But it does not mean the reader should feel any less of themselves.

For this reason, the much-discussed topic of Artificial Intelligence in the context of creating music has been left out of this Bachelor's Thesis. AI is a brilliant tool for sorting through information and arranging it. However, AI cannot have taste, and it cannot create from that. We, as artists, can come up with multi-layered AI prompts to try and put our personal styles into words, but we will always come short of what our taste, subconscious and most importantly, feelings will to existence when we create. AI will not replace taste, nor will it replace artistic expression, feelings and emotions. In the center of music and art in general, is the human experience. And humanity cannot be recreated by something that is not human.

Every aspiring composer and musician can consciously make these choices of combining ideas they love into something they themselves love. In doing so, in listening to our own inner artist, we make sure that there is someone out there who will listen to what we have to say as well.

See APPENDIX 1. for the Extended Play featured in this Bachelor's Thesis.

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## APPENDICES

Appendix 1. Extended Play featured within this thesis.

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