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# Max as a Digital Platform for Noise Music Performance

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**Abstract**

This article explores Max as a digital platform for performing noise music through a practice-led research method. The practice-led research method was used to explore the possibilities of building Max patches, while content analysis method was used to analyse the outcome of the patches. Several Max patches were created to explore the potential of Max as an alternative approach for performing noise music. Findings show that Max can replicate the audio processing methods used in conventional performance. Due to Max capabilities, some of these methods could be automated and arranged prior to the performance. In addition, Max patches featured changing sound, random pitches, mixture of pre-recorded audio source and live instrument, and drone sound combined with automatic constant real-time audio self-processing and automatic audio panning, a feature that seldom appears in the local noise music scene. In conclusion, this research argues that Max has much potential for creating a variety of digital sounds that are harsh and dissonant to the ears, therefore contributing to the musical diversity in noise music performance. These sounds are the results of the features of audio self-processing, random pitches, automatic audio panning object and self-changing pitched drone audio signals relying on random MIDI values that appeared in Max.

**Keywords:** Max; noise music; music technology; performance; practice-led research

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## INTRODUCTION

Noise music is a genre of music where "unwanted" noises are used to create sound art. Noise music performers use analogue methods, including guitar pedal effects, contact microphones, and metal objects to perform. The analogue approach limits the possibilities of creating more diverse noise music compared to the digital approach of sound manipulation and audio signal processing available through programs such as Max. Most noise music performers in Malaysia's underground experimental music scene use synthesizers, guitar effect pedals, metal objects, and mixers to produce noise music. Not many local noise music performers have explored the digital platform in creating noise music. One such artist was File 106 who performed noise music using a mixture of laptop and guitar pedal effects. I believe that digital platforms would benefit many noise music performers, such as access to a wider range of sound manipulation and extra effects. In addition, mobility of travel would be enhanced by these lighter-weight instruments. This research focuses on exp-

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loring Max as a platform for creating noise music performances.

**Max**

Max is a computer software that operates as a visual computer programming language that can manipulate audio, video, graphic, and other data. Max allows users to connect the various independent objects through virtual patch cords to produce interactive audio, visuals and custom audio or visual effects. These objects are categorized according to their functions: Max, MSP, Jitter, Gen, BEAP, and Vizzie. Each of these categories have their own functions (Cycling '74, 2018). This article focuses on the MSP objects that is able to create and manipulate audio signal. MSP are the features in Max that allows the process of audio signal processing. MSP is a collection of 200 Max objects that could be used in performances or compositions for audio signal processing. By using MSP, users may build their own synthesizers, samplers, and effects processors using Max objects. In short, MSP allows users to create their own personalised design of digital audio devices (Cycling '74, 2018).

**Noise Music**

Couprie (2020), Wolf (2011), Klett and Gerber (2014), Thompson (2010), and Hegarty (2001) have each defined noise music from their own experience and understanding of it. Couprie (2020) defined noise music as contemporary music created by Futurist and Dadaist movements. He also referred to noise music as musique concrète, experimental rock music, punk, live electronics, electronica music, and some of John Cage's compositions. Wolf (2011) referred to noise music as those mainly performed by Merzbow, a prominent Japanese noise music artist and his peers. This type of noise music allows audiences to listen and experience the unending limits of sound art production. Wolf (2011) defined noise music as an arrangement of sounds such as hisses, crackling, and audio feedback that does not need to be played with loud volumes for performances (p. 67).

Sound can be perceived from an aesthetic or artistic perspective. Some perceive sound as noise, while others hear it as music. Noise is referred to as chaotic, unusual, and aggressive sounds, while music is commonly perceived as pleasing, rich and wonderful. Both perceptions can be used in the performance of noise music. The noise music genre is associated with the harsh frequencies and loud volumes usually used during music performances. It is also harsh, dissonant, and may be unbearable to the listener. Noise music is usually referred to as "noise" by the performers and enthusiasts (Klett & Gerber, 2014, p. 276).

The musical perspective of noise should be established to comprehend noise music. Noise occurs as a disturbance that occurred amid the music and sound. This perspective recognizes that noise music is situated between "music" and "sound". In Japan, noise music is known as "Japanoise" and recognized as "music" that defies genre and category, with its highly amplified and processed sound (Hegarty, 2007, p. 194).

One of the philosophical aspects of noise music is that it functions as an indicator of boundaries. This boundary is the perspective that noise exists to threaten the limitation of music and noise music is viewed as something that is far-reaching and provocative. Due to this, noise music should maintain a certain distance from music by preserving its qualities to persist between the state of music and noise. Failure to stay in between "music" and "noise" would make it become solely music or noise rather than noise music (Thompson, 2010, p.10).

The noise music in this research is a form of experimental electronic music that embraced the potential of providing physical experience of the sound to the listeners as suggested by Couprie (2020) and Wolf (2011), with characteristic as stated by Klett and Gerber (2014), Hegarty (2001) and Thompson (2010). Based on this, noise music is a type of music that typically uses electronic sound from the synthesizer, and guitar pedal effect, pre-recorded audio

played through sampler or audio recorder. Usage of instruments such as the guitar could also be seen. All these sounds would be manipulated in real time through multiple methods of signal processing such as amplifying, sweeping frequencies, spatialization and frequency filtration.

**Problem Statement**

Many noise music performers use guitar effects and metal objects to perform noise music. For example, Jerk Kerouac, a noise music performer uses the synthesizer combined with guitar effects pedals to perform noise music (Mokhtar, 2015, p. 15). In Malaysia, I came across a local noise music performer utilizing a laptop to perform noise music. Noise music performers such as Merzbow and Krosot who have been using a digital platform somehow reverted to their typical setup for noise performance by using multiple guitar effects pedals, metal objects, synthesizers, and a contact microphone through this research indirectly (Baily, 2012; Mokhtar, 2015). No explanations were presented on the reasons behind their choices. A standard and uniform analogue approach that has been established during performances practises in the local scene results in a lack of diversity in sound production and techniques. I became curious over why local noise music performers do not utilize the digital platform to perform noise in this era where digital technology is advancing rapidly. Therefore, I seek to explore a simpler and mobile alternative setup for noise music performance to relieve the bulky setup that is used in the local Malaysian noise scene.

This research aims to explore the potential of Max as a digital platform for the noise performance. I examine the use of Max as a platform for noise music production by 1) creating patches using Max 2) performing noise music though Max 3) reflecting and revising my usage of Max through the processes of creation and performance I hope to create more possibilities for noise music production among local noise artist setup, performance practices, and sound characteristics.

## METHOD

This research uses the practice-led methodology whereby planning, reflection, revision, and action direct the research outcome.

**Practice-led Research**

Practice-led research is a method in art and design whereby researchers examine their own practice. The practice-led researcher is responsible for both the role of the "researcher" and "practitioner" as the research conducted is based on their own practice (Nimkulrat, 2007). The process leading to the outcomes is important data that facilitate understanding the research problem. The research's artifacts or product would be considered proof of the information collected and preserved (Makela, 2007). In this research, I will present the actions, reflections, and revision processes in my exploration of creating patches for noise music performances using Max.

**Content Analysis**

Audio content analysis assists in the investigation of musical influences (Collins, 2012). Çamci (2016) stated that definitive audio analysis in electronic music could highlight important variations in different electronic pieces. This would help in analyzing the products of this exploration of Max as a digital platform for noise music performance for the outcome could be recognized as noise music.

**Exploring Max**

This research models the workflow used by Bugge (2014) in his compositions using Max. The workflow begins with forming ideas for drawing techniques applicable to a computer programming setting, testing, evaluation, redefinition, recording, positioning materials into a musical composition, and assessment process (pp. 62-63).

**Concepts of Performance**

As a performer, I am inspired to perform noise music based on the principles

of interactive composition, generative music, indeterminacy, and chance, as well as the usage of various sound sources that is collectively incorporated into this research.

Interactive composition is the procedure of creating and performing the composition and usually involves electronic devices operating a real-time software that would detect and respond to the input from the performers or composers. Technology usage is equally important to the composition itself to achieve the objectives set in the composition by the composers in interactive composition. The technologies itself would be producing the creative process, functioning as a catalyst for motivation and discovery (Settel, 2001).

Chadabe (1977) stated that generative music is not a new phenomenon because it had been used for several decades in live musical performances and is related to generative art or G-art that refers to works that contains a segment or is entirely based on designs that are not directly organized by the artists. The term CG-Art or computer-generated art is used when generative music involves computer usage. This art is completed by allocating a certain period for a computer program to self-operate in order to generate the art with zero to minimal intervention from human (Boden & Edmonds, 2009).

Indeterminacy and chance are utilized in the process of exploring Max as a digital platform for noise music performance because indeterminacy and chances would provide different outcomes from each performance (Neal, 2008). Cage noted that indeterminacy is used because it could relate to the uncontrollable chances humans endure in their everyday lives (Hoogerwerf, 1976). Xenakis employed chance with a more scientific approach to his composition due to the usage of mathematical procedure to control and shape the sound masses in his composition (Paparrigopoulos, 2005).

The noise music performance I produced in this research would contain multiple sound sources, such as electronic sound synonym with the electronic music. Electronic music is produced by a computer through the synthesis of the computer and processed digital audio signal (Puckette, 2007). The performance would also employ the usage of audio from field recording that is consists of human, animals, material, natural sound phenomenon, and is different from the orthodox audio production of music, speech, and sound effects since it combines the method of listening, reviewing, adapting recordings, positioning, mixing, playback, and testing (Gallagher, 2015). Another type of sound source used is audio that had been transformed from analogue to digital to analogue through the usage of analogue to digital and digital to analogue converter. According to Cipriani and Giri (2010), the digitization process occurred at the regular interval where the number of amplitude measurements would be taken in one second, also known as the sampling rate.

## RESULT AND DISCUSSION

In this research, I created several patches that could be used in the performance of noise music in the process of exploring Max as an alternative digital platform according to the concepts of the performance that had been discussed. These patches were made during the period in which the researcher was developing as a performer and researcher. They are displayed through the technicality of seven Max patches created to explore an alternative digital platform for noise music performance.

### Patches built using Max

My patch creations developed in analogy to my ability to use Max, as shown by the Max patches' complexity. For easier understanding, the outcome from all the patches would be described at the end of the explanation.

For the first patch, the idea started with the main idea of triggering random noise. To achieve this, several reading on how to achieve this had been done before I had chosen the patch that was used in this research. This patch showcased sound

changes according to the audio self-processing in the individual patches.

The second patch was built around the idea of filtering audio using cascade object while the signal-rate processor would change the audio signal-rate. The patch needed several revisions since the sound was not "noisy" and lack distortion. I had to make several tuning up and revisions were made before an acceptable sound was produced by changing the parameter of the patch. There were sound changes according to the audio self-processing appeared in this individual patches. Besides that, for patches with random MIDI control such as patch 2, random pitches would be appeared as the random MIDI control independently changing their values.

Patch 3 is a combination of the ideas behind Patch 1 and Patch 2. Patch 3 is designed to play several random audio clips at once. At first, the progress did proceed as planned due to several misconnection and parameter that did not affect the sound drastically. Upon reflection, I double checked the connections and adjusted the parameter to change the sound more drastically. There were sound changes according to the audio self-processing appeared in this individual patches. Similar to patch 2, patch 3 also contained random pitches appearing in response to the random MIDI control independently changing their values.

Patch 4 was used to create a wall of sound. This patch contained an audio self-processor that processed the audio recording placed in the patch. After necessary editing was done, the patch had achieved what I had planned and anticipated in terms of sound diffusion. This action was a reflection of the researcher's newfound knowledge of Max that enable the researcher to create a patch resembling noise music better than before. This need to be stated that the progression is unique to my experience and may not appear in other person experience when they are using Max. After necessary editing was done, the patch had achieved what I had planned and anticipated in terms of sound diffusion. There were sound changes according to the audio self-processing appeared in this individual patches. This patch had also showcase one or more automatic audio panning object, with the appearance of constant real-time audio self-processing by Max.

Patch 5 was built as a mix media patch that used the MSP and Jitter in Max. This action demonstrated the researcher's developing knowledge of using Max as a digital platform for performing Noise music. The audio side of the patch works well, while the Jitter or video component needed some adjustment for it to run smoothly. Necessary editing was done after the Max help files were referred. This patch had showcase sound changes according to the audio self-processing appeared in this patch, Besides that, self-changing pitched drone audio signal relying on random MIDI control was also a feature. This patch had also showcase one or more automatic audio panning object, with the appearance of constant real-time audio self-processing by Max.

Patch 6 was the most complicated patch that I had built. It consists of several patches in one big patch such as patches for audio self-processing, real time MIDI control, pre-determined parts using timepoint object and two types of audio panning. This patch demonstrates the potential of Max for a noise music artist with expanding knowledge of Max compared to earlier patches. This had showcase sound changes according to the audio self-processing appeared in the individual patches. Besides that, for patches with random MIDI control such as patch 6, random pitches would be appeared as the random MIDI control independently changing their values.

Patch 7 is the final patch built using Max for this research. Patch 7 uses live audio and live audio processing combined with the usage of live vocal and instruments playing. The action taken for this patch was to look at it as a way of performing using live instruments or live audio input such as the common way noise music

being performed. However, this approach failed due to different mechanism involves in physical audio effect pedal and digital signal processing. The patch needs to be troubleshot in order to find suitable way of combining internal audio and external audio incoming and exiting the audio interface. Patch 7 tried to create a patch that combined the mixture of a pre-recorded audio source and live instrument playing with real-time audio processing in Max. Patch 7 also combine the usage of real instruments and real-time instruments playing with real-time audio processing.

From all these patches, I conclude on that several characteristics were compulsory for the patches to be considered as suitable for noise music. These characteristics had appeared in majority of most of the patches showcase sound changes according to the audio self-processing appearing in the individual patches. For patches with random MIDI control such as patch 2 and patch 6, random pitches would be appeared as the random MIDI control independently changing their values. Some of the patches such as patch 2, patch 3, patch 4 and patch 5 showcase appearance of drone sound. In shorts, all the patches showcase one or more automatic audio panning object, with the appearance of constant real-time audio self-processing by Max. This would then create panned audio that is self-processed by Max. usually, there are two types of audios panning: in sequence and random Only patch 7 tried to create a patch that combined the mixture of a pre-recorded audio source and live instrument with real-time audio processing in Max.

**Reflection of performance using patches created.**

I had created Max patches with elements of interactive compositions in them. This was successful through the exploration of Max objects such as button, toggle, number, slider, gain~, slider, and object box that enabled me to create Max patches that could stand alone without (or with minimal interference of) me as the performer. The button and toggle enabled me to interact with Max by sending a one shot and hold signal, respectively, to Max when there was need for this type of signal. Max objects or tools such as number, slider, gain~ and kslider enabled me to interact with Max when specific values needed to be processed in Max. These values usually were used to output integer values while the kslider would be used when a midi value needs to be sent to Max. Finally, the object boxes were used to type the name of Max objects that needed to be used to achieve certain elements of sounds that I wanted.

I had successfully used multiple Max objects individually or collectively to produce generative sounds, enabling me to create Max patches with elements of generative music. One of it is the usage of the combination of clocker object, counter object and sel object. These objects would be connected in a series to inform Max to output a signal at certain intervals. Usually, this combination will be connected in a series of objects that feed into the random or expr objects that represent the next elements of performance, indeterminacy, and chance.

The usage of indeterminacy and chance had been explored in this research by feeding a fix signal production into objects such as random and expr objects that helped to achieve the indeterminacy and chances to enforce the elements of generative music. For example, a value between 0-150 can be produced at a fixed period by setting the clocker, counter, and sel object value to trigger the random object set to 150. Setting the sel object value to 1 would trigger a fix signal production on the first count. A more precise alternative was connecting an expr object that enables me to obtain value between two numbers at a fixed output rate, which is output in a smaller number range compared to the random object. For example, setting the expr object to expr random (10 – 20) enable the production of a value between these two numbers at a fix output rate.

All patches had used multiple sound sources such as electronic sound, field re-

cording and analogue to digital to analogue audio with the intention of making it more diverse, clashing and jarring. These audios were pre-recorded (field recording), electronic sounds created in real-time in Max and from real instruments sending real-time signal to Max before being processed by Max and diffused by the amplifiers. One of the objects involved in this process is the cycle~ object. These objects would create periodic waveform (Cycling '74, 2018). The values of this object could be set permanently but a number object (clocker, counter, sel, and random objects) connected to this object enable different values production at a fixed rate, ensuring that the frequency of the cycle~ changes by itself.

In short, Max objects were utilized to achieve the objective of Max as a digital platform for noise music performance as intended by the researcher although the result would be unique to the users.

## CONCLUSION

Several criteria were implemented for the patches to be considered as suitable for Noise music performance. These criteria are such as they would: Be considered as interactive compositions with parts generated by Max itself to fit into the criteria of generative music. Utilize indeterminacy and chance to make the patches produce noise music that that crosses genre and music category, with highly amplified and highly processed sound. Contain multiple sound sources to make it more clashing and jarring. Such sounds sources are electronic sound, field recording, and analogue to digital to analogue audio.

These characteristics had been used to ensure that the outcomes of the patches fit into the definition proposed of noise music cited by Couprie (2020), Wolf (2011), Klett and Gerber (2014), Hegarty (2001), and Thompson (2010).

All of this had been considered while developing the Max patches. Several techniques to create patches that reflected the concept of intended The noise music performance that I wanted to implement and the Max objects that corresponded to the steps that I needed to take to achieve it was explored and discovered.

I could also create random pitches and drone sound that could be combined with automatic audio panning object. This combination utilizes the appearance of constant real-time self-processed audio by Max, with two types of audios panning: in sequence and random. I could also create patches that feature a mixture of a pre-recorded audio source and live instrument audio signal with real-time audio processing in Max. These audio characteristics are almost impossible to be performed on analogue equipment such as guitar effect pedal and analogue synthesizers that were used by the majority of noise music performers automatically and without human direct intervention.

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