

UNIVERSITY OF CALIFORNIA SAN DIEGO

Learning From Noise

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy

in

Music

by

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University of California San Diego

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ABSTRACT OF THE DISSERTATION

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by

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Doctor of Philosophy in Music

University of California San Diego, 2026

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Throughout this portfolio of works, I examine how my musical practice has been affected by my understanding of noise. I treat noise not as a replacement for musical structure but as a set of pressures applied to my musical language. These pressures stem from four different understandings of noise. The first is timbral, a sound with a greater presence of inharmonic

frequencies. The second comes from Attali. To him, noise is some sound that interferes with the ability to understand a message. Drawing from Baudrillard, I understand structural noise as the confusion that arises when representations and imitations of sounds replace the original versions. The last understanding of noise is Hegarty's relational view of noise. After discussing key figures in the development of noise within music history such as Helmut Lachenmann and John Cage, I present a series of analyses of my own works: *Deepfake* for cello, electronics, and video, *jeanne* for vocalist and electronics, *Displacement* (a sound installation), and *Appendages* for reed quintet. I show how the structural and narrative construction of these works has been influenced by the four proposed definitions of noise. Finally, I conclude with how these pressures from my understanding of noise illuminate connections between these pieces and present possibilities for future artistic exploration.

1.

WHAT AM I PROPOSING?

In this portfolio, I treat noise not as a replacement for musical structure but as a set of pressures applied to my musical language. Although my practice is not inherently noisy, I look for applications of noise's disruptive tendencies to challenge my personal aesthetic choices.

Noise is not easily classified under one consistent definition. Within my musical practice, I am particularly interested in four specific orientations towards noise. There is noise as defined by its timbre. In this case, a noisy timbre contains a greater presence of inharmonic frequencies. Examples of this include the various classifications of synthesized noise (white, pink, or brown noise) or instrumental extended techniques such as scratch tones on bowed string instruments. Another understanding of noise comes from Attali. He believes that noise is "a resonance that interferes with the audition of a message in the process of emission."¹ Noise makes it more difficult to understand something. Musically, this might take the form of a new sound overtaking or interrupting the current sonic landscape. Drawing from Baudrillard, his ideas of simulacra and simulation create the possibility for structural noise. A sound might be imitated by another instrument. That imitation might be copied again by yet another sound source. This imitation of imitations is now nearly entirely simulacra without direct reference to the original.²

Hegarty proposes a phenomenological understanding of noise. To him, noise occurs in relation to how it is perceived. This changes based on who is creating the sound, what the sound is, and where and when it is happening. Applying this understanding of noise, even aurally pleasant sounds might be considered noise in the right situations. This includes the intention

¹ Jacques Attali, *Noise: The Political Economy of Music*, trans. Brian Massumi (University of Minnesota Press, 1985), 26.

² Jean Baudrillard, *Simulacra and Simulation*, trans. Sheila Faria Glaser (The University of Michigan Press, 1994), 6.

behind the sound: is the sound maker attempting to turn music into something disruptive? For example, classical music played to deter homeless people from loitering has a noisy quality that classical music performed in a concert hall does not. The location imbues classical music with a noisy power because it functions violently against unwanted perceivers.

To make things more complicated, one sound might contain multiple orientations to noise simultaneously. Using digital signal processing, a computer can transform the tone of a musical instrument into something that is a noisy timbre through distortion. At the same time, that distortion could additionally impede the audience's ability comprehend the original sound. Therefore, this sound could be described as noise through both its timbre and its interference with emission. On the other hand, this sound's position as noise might be negated through a phenomenological perspective on noise. If the intention behind the distortion is not to disrupt, then these processes are simply musical techniques upholding traditional forms of sonic communication.

Since the early 20th century, many composers have advocated for the introduction of noise of some kind to be a part of music. Schoenberg's approach to harmony contains the beginnings of a phenomenological understanding of noise. He argues that "what distinguishes dissonances from consonances is not a greater or lesser degree of beauty , but a greater or lesser degree of comprehensibility."³ This is supported by the historical development of increasingly dissonant or unusual harmonies within European classical music. Because audiences were accustomed to these sounds, their grating qualities lost their shocking nature. Through the emancipation of dissonance, he considers dissonance and consonance equally comprehensible.

³ Arnold Schoenberg, *Style and Idea* (Philosophical Library Inc, 150), 104.

Utz argues that Lachenmann is central to the integration of timbral and phenomenological noise within music as a continuation of modernist aesthetics. Even before the development of *musique concrète instrumentale*, Lachenmann aligned himself with avante-garde universalism which rejects any boundary between musical tone and noise.⁴ One frequently overlooked aspect of Lachenmann's disruption of classical music is how he engaged with history and the canon. He ardently positioned his work in relation to the canonical composers before him. He regarded his relationship to previous canonical composers as dialectic structuralism where he believed that a deep relationship with tradition is necessary for any critique of that tradition. *Musique concrète instrumentale* proved to be particularly scandalous because it posited that those sounds have the same artistic merit as the musical structures of previous great composers. It was not necessarily the sounds themselves were most upsetting, but this relationship that Lachenmann posed between his music and the past.

John Cage advocates for noise in an entirely different manner from Lachenmann. Cage believed that questions of consonance or dissonance were secondary to the differentiation between noise and "so-called musical sounds."⁵ Whereas Lachenmann questioned the playing technique and musical organization of traditional instruments, Cage argued for the inclusion of sounds produced by any means including electronic instruments and other technological devices. Cage also famously explored the potential of silence. Hegarty and Kahn both agree that "4'33" is the containing of noise, the opening up of noises to musicalization."⁶ This piece points out the

⁴ Christian Utz, "Is There Noise in Helmut Lachenmann's Music: Temporal Form and Moments of Presence in the String Quartet Gran Torso," in *Noise as a constructive element of music* ed. Mark Delaere (Routledge, 2022) 140.

⁵ John Cage, "The Future of Music: Credo," in *Audio Culture* ed. Daniel Warner and Christoph Cox (Bloomsbury Publishing Inc., 2022), 27.

⁶ Paul Hegarty, "Noise Not Music," in *Noise as a Constructive Element of Music*, ed. Mark Delaere (Routledge, 2022) 76.

limit of music composition whereby attempting to write music using noise, the piece fails to be noise. The piece also reflects a different orientation towards listening. Cage calls upon the listener to hear nonmusical sounds in a new way to access the “inherent musicality of the universe.”⁷ By forcing the listener to grapple with an aesthetic consideration of silence, he forces them to consider all aural phenomena as music.

As composers continually challenge the primacy of musical sound over noise, audiences begin to expect noise of some kind in new music. These expectations inevitably shape our understanding of the work through the normative structure of a work’s genre which has the potential to neutralize the political agency of noise within new music. According to John Frow, genre “is a set of conventional and highly organized constraints on the production and interpretation of meaning.”⁸ Despite its negative connotation, he uses the word constraint to mean guideline, or something to give a piece its shape and form.

All of the features of genre that Frow lays out apply to new music. While new music may appear to be a postmodern free-for-all, there are in fact constraints regarding “the production and interpretation of meaning.”⁹ For example, tonal idioms and romanticism tend to be regarded as passé or retrogressive while the genre promotes the subversion of beauty and previously defined musical structures. Such tastes push composers to search for new sonic methods resulting in what many might define as noise. This also implies intertextuality: the music refers to other works for justification of its structural and aesthetic content. These works exist within the same

⁷ Paul Hegarty, *Noise / Music: A History*, (Continuum, 2007) 16.

⁸ John Frow, *Genre* (Routledge, 2015), 10.

⁹ Ibid.

“coordinates of time and space”¹⁰ in the present day and on the fringes of classical music institutions. Its moral ethos and thematic structure are rooted in its teleological development of western European classical music through either its subversion of or promotion of those musical aesthetics. The physical setting, in the sense that Frow uses the term to describe a genre, is both the sounding result of a composition and/or the written score that explains its creation and duplication. Although it is hotly debated whether the location of a composition is in its sound or its score, most would agree that it certainly exists in a least one of those two places. Through an understanding of a work’s genre, the audience is better able discern meaning from new music.

There is, however, tension between the classification of new music as a whole and the philosophical impetus for subversion. If there is an expectation for a work to go against or move away from historical precedent and the work engages in its expected subversion, the genre runs into a paradox. By expecting surprise, surprise is no longer surprising. Relatedly, whereas noise is defined by its distortion of meaning or the interruption of a message, if noise is expected, then it is no longer the interruption but the message itself.

If I were to use noise as the generative strategy for my music, the works would fall into this paradox of institutionalized noise. On the other hand, the different definitions of noise provide various creative potentials for exploration even if the application of these sounds strips them of their status as noise. In the following chapters, I reflect on how I can learn from the behaviors of noise to inform my musical practice. *Deepfake*, for cello and electronics, explores the spectrum between real and artificial as a metaphor for truth in a world of AI-generated content. *jeanne*, for voice and live electronics, attempts to understand how social and historical

¹⁰ Frow, *Genre*, 10.

forces impacted Joan of Arc both while she was alive and how her story was subsequently retold. The interactive sound installation, *Displacement*, illuminates the ramifications of the military on civilian spaces through the military's sonic presence. Finally, *Appendages*, for reed quintet, investigates the noisy properties of oversized PVC clarinets and how an ensemble can interact with those sounds.

2. DEEPPFAKE

WHAT IS IT?

Deepfake is a piece for cello, fixed media electronics, and video created in collaboration with Robbie Bui. We worked together to develop the conceptual framework that underlies the piece. To best organize our workflow, I composed the music first, and Robbie constructed the video around the existing musical material. Whereas the musical material examines different gradations of cello sound (ranging from normative tone production to extended techniques and algorithmic reproduction), the visual material explores different gradations of the cellist himself. Through the video, the visual language moves between abstraction and representation in parallel to the music's shift between noisy and melodic music.

GOALS

Deepfake investigates what it means for a sound to be 'real' when live performance and algorithmic reproduction become indistinguishable. The piece explores a gradient between the live performance of a normative cello sound and synthetic reproductions and approximations of the cello sound. To best accomplish this, the piece examines two axes of sonic parameters: the spectrum between live performance and electronic reproduction and the spectrum between music and noise.

The cello is retuned with extreme scordatura to highlight the differences between standard cello sounds and other noisy performance techniques. By retuning the C-string down one octave, the low string no longer behaves normally: the lack of tension causes it to flap noisily against the fingerboard. Also, the scordatura creates a large gap in playable range of the cello with an octave plus a perfect fifth between the third and fourth strings. These independent registers further highlight the differences between the noisy fourth string and the rest of the instrument. In a musical context, this retuned cello functions as two unique instruments: a noisy one string bass and three quarters of a regular cello.

Extended techniques also suggest a noisier position on this spectrum. These techniques include harmonic trills, multiphonics, and overpressure. None of these sounds have stable pitch material (especially when played on the detuned C string) and bring out different timbral characteristics compared to standard playing technique. The musical tension between these techniques and normative cello playing helps structure the dramatic arc of the piece.

This same spectrum also exists within the electronics. MIDI cello samples exhibit many of the musical qualities of a real cellist. On the other hand, the physical modeling algorithm used in this piece creates a timbre so electronic sounding that it is difficult to tell that it is supposed to imitate a cello. Most of the electronic sounds in the piece fall somewhere in the middle of this

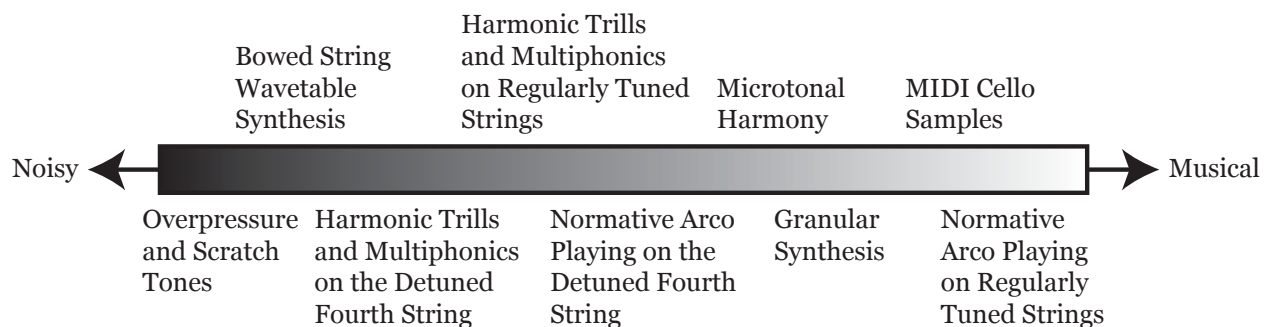


Figure 1: The Noisy to Musical Spectrum Summary

continuum. Their exact positioning within this spectrum is less important than the fact that these relationships exist.

At the same time, components of the piece exist along a gradient ranging from the real (performed live with standard techniques on orchestral instruments) to the artificial (reproduction and approximations created electronically). The live performance of traditional arco playing with melodic musical material emphasizes the real part of this spectrum. Within the piece, the primacy of the real is immediately challenged by various levels of imitation within the electronics. MIDI cello samples and prerecorded audio of live performance are on the farthest end of the real spectrum while distorted physical models of bowed strings, wavetable synthesized strings, and other electronic sounds lie on the other end of the artificial spectrum. Just like the noisy-to-musical spectrum, the specific location of each sound on the continuum is not as important as the fact that this relationship links all of the sounds.

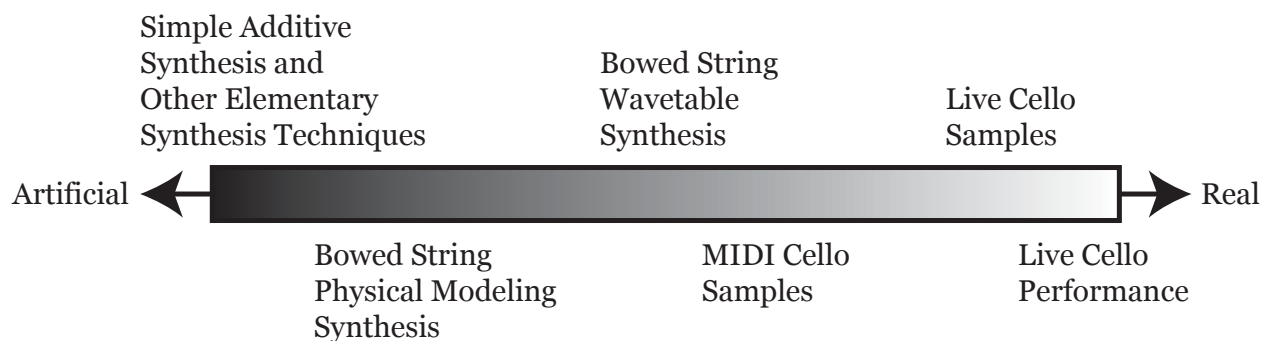


Figure 2: The Artificial to Real Spectrum Summary

MUSICAL STRUCTURE

This piece is roughly divided into four sections. The first two sections present two musical states with different positions regarding the real-to-artificial spectrum and the noisy-to-

musical spectrum. The last two sections seek to explore the relationships between those sections and put their constituent parts in dialogue with each other.

Table 1: Structural Overview of Deepfake

	Section 1	Section 2	Section 3	Section 4
Duration	mm. 1 - 70	mm. 70 - 127	mm. 128 - 156	mm. 157 - 193
Emphasis	Artificial / Noise	Real / Musical	Both in Dialogue	Both, as One

Section one opens with a low droning electronic sound. This sound and manipulations of it construct the sonic backbone of the fixed media throughout the first section. The sound was first composed in Max MSP before being transferred to the fixed media. It is synthesized using the bowed~ object which implements Woodhouse's¹¹ algorithm for modeling a bowed string. Rather than attempting to closely imitate the sound of a cello, I aimed to only give the impression of a cello that is distinctly artificial. The physical modeling algorithm is further obscured by additional signal processing in the form of delay, distortion, and a Schroeder reverb.¹² Like the physical modeling synthesis, the outdated Schroeder algorithm for reverb does not give a lifelike approximation of a real acoustic space. Instead, I use it for its metallic sound quality and to muddy the overall texture.

The patch chooses notes and rhythms through a series of random processes. Each note is between 1 and 4 seconds long, and they are always multiples of 0.5 seconds. Each pitch is randomly selected from the following pitches:

¹¹ Perry Cook and Gary Scavone first implemented this algorithm into their Synthesis ToolKit, and Dan Trueman converted that into the bowed~ object. For more information about STK, see Cook and Scavone's 1999 article "The Synthesis ToolKit (STK)" in the International Computer Music Conference Proceedings. For specifics regarding Woodhouse's algorithm, look at his article "Physical Modeling of Bowed Strings" in the Computer Music Journal.

¹² A Schroeder reverb is one of the earliest algorithms for artificial reverb developed by M. R. Schroeder in 1962 using parallel feedback comb filters and a series of allpass filters. For more information, see "Natural Sounding Artificial Reverberation" in the Journal of the Audio Engineering Society, July 1962, Vol. 10, No. 3.

Table 2: Possible Pitches of the Physical Modeling Drone

Frequency	65.41	87.19	94.02	98.11	109.0	114.5	122.6
Note	C	F	F#	G	A	Bb	B
Ratio	1:1	4:3	23:16	3:2	5:3	7:4	15:8

Although the patch can act polyphonically, the number of voices present does not remain consistent. Instead, the patch adds a new note every 15 seconds, and additional notes whenever the volume drops below -70db. This ensures that there is constant and continuous output.

In addition to the physical modeling drone, other electronics come and go from the texture. These sounds mainly include sine tones, sawtooth waves, and fixed media manipulations of the drone described above. Rather than using Max, I composed this directly in Ableton Live using VST plugins. The plugins are tuned in the following just intonation ratios (F# and G# are tuned in equal temperament):

Table 3: Intonation Relationships between VST Plugins

Note	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
Ratio	1:1	17:16	9:8	7:6	5:4	4:3	N/a	3:2	N/a	5:3	7:4	15:8

Whereas the drone is constant, these other electronic sounds are specifically shaped around the cello part.

The first notes of the cello copy the hazy droning sounds of the electronics. The cello shares much of the same pitch material and occupies a similar register. Like the drones, it emphasizes a C and F overtone series. The harmonic trills and multiphonics mimic the hazy timbre of the electronics. These extended techniques create a backdrop out of which musical material blooms.

The primary musical motif of the first section is primarily based on melodic contour. Starting from the open C string, it is characterized by a rising leap and smaller descending glissando. This first appears in the cello in measures 19 and 20. Until measure 40, the leap up is always a minor third. As this section progresses, the upwards leaping interval grows. First it

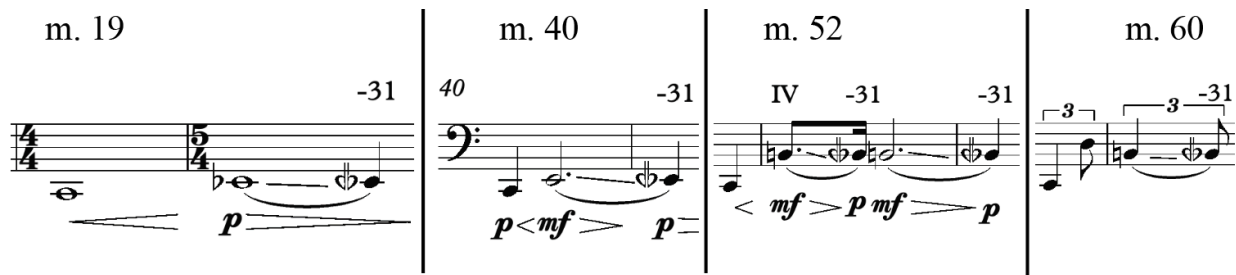


Figure 3: Score Examples of Motivic Interval Augmentation in Section 1

grows to a major third, then to a major seventh, and finally to a major ninth. The continuous growth of the musical motif helps this section slowly build intensity.

It is sometimes difficult to distinguish what is noise or texture as opposed to motivic material. For example, in measure 29, the cello starts playing what might be the primary musical motif before the sound evaporates into harmonics and multiphonics. This ambiguity complicates the overtly musical idea of a melodic motif as a structural element using noise to impinge on its formal meaning.

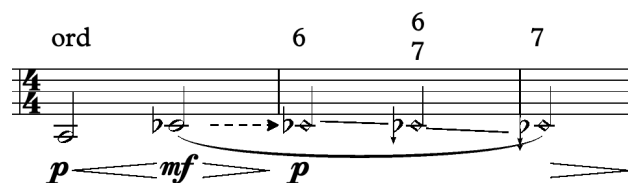


Figure 4: Measures 29 to 31

One main goal of this section is to draw the cello sound out of the electronics. As this section progresses, the cello moves from blending in with the electronics to appearing prominently in the foreground. The dynamics of many gestures in this section fade in and out allowing the sound to appear and disappear from the sonic texture. The longer attack time of the low C-string enhances this effect. The sustains in the opening blend more easily with the droning electronics. As the cello becomes more active, it becomes noticeable. Likewise, the growing dynamics increase the volume of the flapping noise of the low C-string adding further timbral separation between the cello and electronics. The process of excavating the cello sound from the electronics mirrors the process of searching for reality amongst AI-generated media.

The second goal for the first section of the piece is for the pitch to rise from the low C of the detuned string up to the normal register of the cello. The figure below illustrates this by highlighting structurally important pitches. The low C in measure nine is the first entrance of the

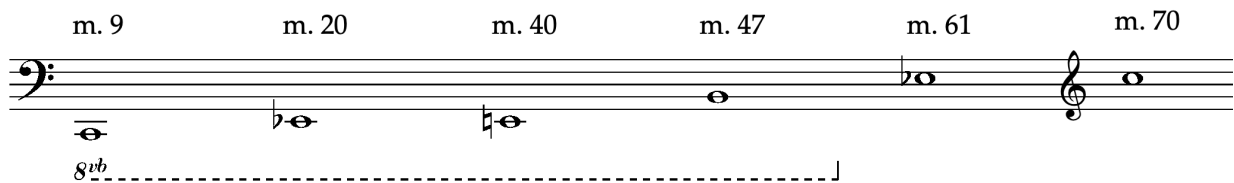


Figure 5: Harmonic Trajectory of Section 1 of *Deepfake*

cello. The Eb in measure 20 occurs during the first appearance of the main melodic gesture of this section. This note is further emphasized by the electronics which announce the beginning of this musical phrase with a strong attack. After 20 measures of only the notes C, D, and Eb, the introduction of Eb in measure 40 is striking. The glissando gesture starting in measure 42 arrives at B in measure 47. This pitch is structurally important because the melody repeatedly returns to that pitch as its high point. Even after the melody moves past it, it continues to emphasize and

embellish that note. The E $\flat$ in measure 61 is the first time the cello part consistently uses the regularly tuned third string for melodic material. The downbeat of measure 61 is also marked with a dramatic shift in dynamics which further draws the listener's attention to this note. Finally, the pizzicato C is the final note of this section, the highest fingered pitch, and the only pizzicato note.

This analysis might seem to ignore the pitch material of the harmonics and multiphonics throughout the first section. However, these musical elements fulfill a different role than the structural pitches outlined above. The long slow glissandi between natural harmonics and multiphonics are often much quieter than the surrounding music and texturally more similar to the droning electronics. The airy tone and different register of the artificial harmonics disconnect it from its normally fingered neighbors. Similarly, the less defined pitch of the harmonic trills hides its musical relationship to the melody. Instead, these trills act as clouds of noise somewhere in between the cello melody and the static electronics. Together, these elements create a noisy haze around melody that rises from the low-C string.

At the end of the first section, there is a brief flash forward moment hinting at what is to come before it arrives. In measure 61, the dynamics dramatically drop from fortissimo to piano, and the cello moves up to the third string to briefly highlight E $\flat$ as a tonal center. This foreshadows the harmony of the upcoming section. In fact, a direct repetition of measures 61 and 62 occurs in measures 86 and 87. At the same time, the music still contains fragments of the first section; the second half of measure 64 and all of measure 66 contain iterations of the motif from section one. The fixed media further highlights the flash forward elements. The synthesized material jumps into a higher register, previously unused in the piece thus far, which hints at the

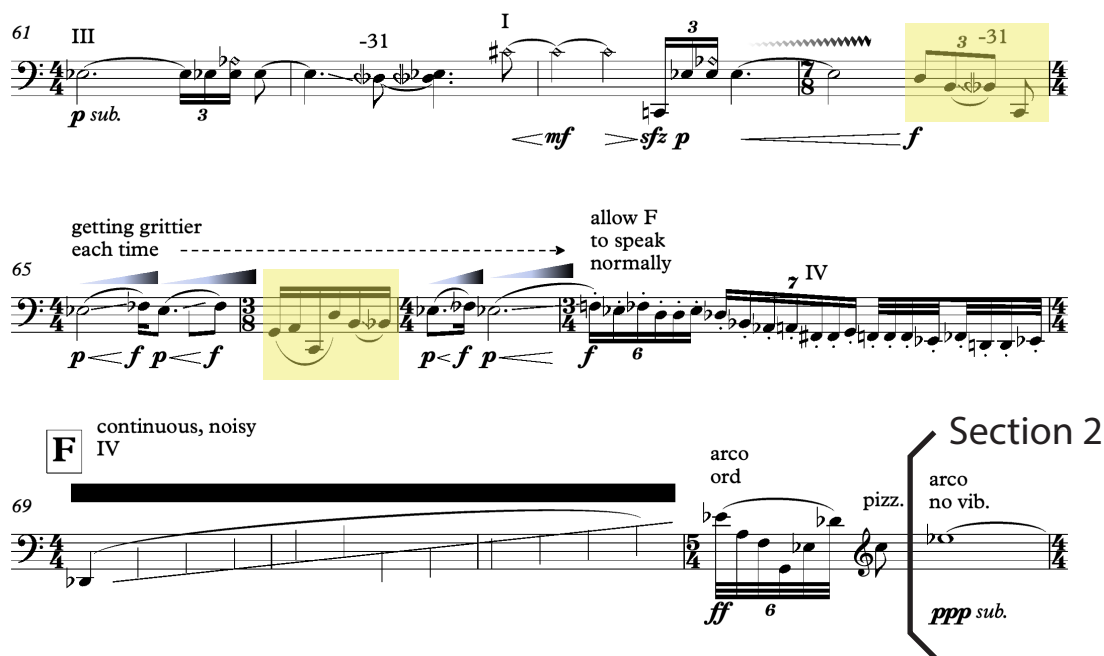


Figure 6: the highlighted material refers back to section one while the surrounding music foreshadows section two.

range that the second section will occupy. This moment also briefly introduces other timbres that will become more important later in the piece including synthesized string sounds and a grinding noisy sound. The synthesized strings become a main feature of the accompaniment in the second section, and the grinding noise returns in future transitions and key climactic moments.

The second section of music fades in after the violent conclusion of the first and continues until measure 127. The second section serves as opposition to the first. Whereas the first section drew musical possibilities out of a noisy sonic landscape, the second section is more

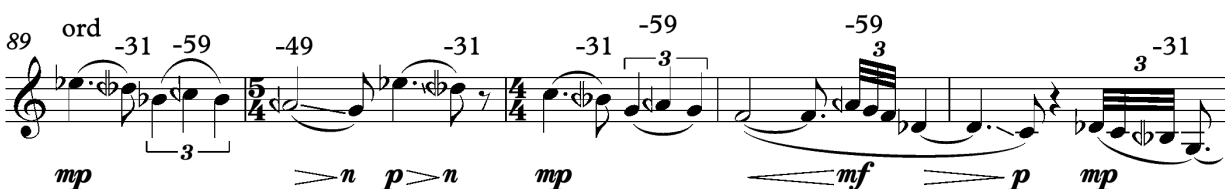


Figure 7: The Primary Musical Motif in Section 2

traditionally melodic. The main melodic motif for this section implements slightly different spectral harmony compared to the first section. Starting in measure 89, the melody notably traverses multiple different overtone chord fundamentals. Measures 89 and 90 follow an E $\flat$ fundamental, and measures 91 to 93 trace a C fundamental. Whereas the music of the first section was constantly rising, the second section is the opposite. The melody shown above is a series of descending figures. On a larger scale, the musical trajectory throughout this section is a long slow descent from the cello's upper register back to the open low C string.

Like the first section, this section plays with the relationship between the live cello sound and a gradient of cello-adjacent sounds within the fixed media. It opens with synthesized tones which while not particularly similar to cello exhibit a similar dynamic envelopes. The cello is further imitated by prerecorded iterations of itself, MIDI cello sample libraries, and wavetable approximations of a cello sound. When the section begins on the section beat two of measure 70, the cello is in a three-part canon with prerecorded versions of itself. Each voice is separated by a quarter note. As the music becomes more active, the counterpoint grows in complexity. In measure 89, the electronics add a fourth imitative voice. At measure 100, the voices shift from being offset by a quarter note to an eighth note. The distinction between live cello and imitation cello becomes blurriest in measure 109. Here, the cello part is accompanied by three versions of itself along with MIDI cello that sustains the same notes as the performer. Unlike the synthesized cello sounds before, the MIDI cello sounds are more lifelike making it challenging to differentiate it from the live performer. Additionally, the MIDI cello runs through a delay plugin that adds even more copies of cello sounds, fully enveloping the audience in cello and its reproductions. While the first section proposes a relationship where the cello is an extension of

the electronic sounds, this section suggests a symbiotic relationship where the two entities are two parts of one whole. The electronic imitations work in conjunction with the live performer to create one harmonious musical texture.

Although section two has many inherently musical qualities, there are still aspects of noise within its construction. As the live cello and fixed media blend together, it creates perceptual noise that interrupts the audience's ability to understand what is performed live and what is electronic. Following the metaphor put forth by the title, this noise exhibits how deepfakes undermine people's perception of truth despite their realistic appearances.

From measure 128 to 157, the third section seeks to find a balance between the two musical states put forth in the preceding sections. The harmony of this section combines overtone chords from both previous sections—stacking C, E $\flat$ and F fundamentals on top of each other. Likewise, the musical material consists of a blend of sections one and two. The electronics are mainly derived from granular synthesis with each grain coming from earlier parts of the piece. The grain size is just long enough that each grain is recognizable as a unique sound but not so long as to allow the listener to comprehend the source's musical context. The grain density is also sufficiently high that it creates a swirling collage of sound.

The cello part imitates the process of granular synthesis. It was composed using random processes to select short fragments of music from earlier in the piece. A simple Max patch selected random eighth-note-sized units of music from the first 124 measures of music. After generating results, I manually filtered the results to ensure the music sounded sufficiently random.

In both the cello and electronics, the references to prior material are so short and so densely packed together that the surface activity is too wild to audibly hear these processes. Whereas previous sections relied on timbral imitation to blur the boundary between cello and electronics, this section mainly relies on the similarities in musical behavior between the two parts. Referring to the title, this action might symbolize the constant deluge of AI-generated content created so quickly and in such high quantities that it is difficult to tell whether it contains any truthful information.

The final section seeks an uneasy resolution between the first two sections. The melody starting at measure 157 is loosely based on the motif from section one. However, it is played in the same register as section two with similar accompanying electronics. Also like section two, it moves between fundamentals, from E $\flat$ to C to G. Starting in measure 168, the connections to the first section become more apparent. Long glissandi and harmonic trills on the fourth string harken back to the noisy atmosphere that began the piece. Contradictorily, the electronics never leave the sound world of the second section. In measure 171, there is even a reprise of the imitative melodic figure from section two. This time, it is disfigured by a bit crusher. The piece reaches a final state of repose when the sustaining synths finally glissando into one awkward chord: C, E $\flat$, and septimal B $\flat$. The combination of just intonation and equal temperament create an unsettled feeling despite the finality of resolving from a polychord (three iterations of the these intervals: one rooted on C, one on F, and one on G) to a single sonority.

RELATIONSHIP TO NOISE

The title of the piece, *Deepfake*, positions the piece within a broader political conversation. A deepfake refers to AI-generated media that creates lifelike depictions of real

people doing things that did not happen. These images and sounds have serious societal implications. The first and most common deepfakes insert real people into pornographic videos without their consent.¹³ There has also been substantial scholarship on how this technology might negatively impact trust in institutions and democracy.¹⁴ Ultimately, Garlin Gilchrist believes that this “could eventually lead to an ‘information apocalypse’ in which fact becomes indistinguishable from fiction, and people give up trying to tell the difference.”¹⁵ With deepfakes acting as noise, they disrupt the transmission of reality and distort the truth.

While this piece was not created with AI, it replicates phenomenon similar to deepfakes and their relationships to knowledge. The electronics imitate the sounds and properties of the cello in various forms using physical modeling algorithms, MIDI cello mockups, prerecorded samples, and other synthesized tones with related characteristics. The cello moves between noise and standard cello timbres blurring the boundary of what constitutes the sound of a cello just as deepfakes alter the line between truth and fiction. The detuned C-string acts like a deepfake cello: simultaneously producing the sound of a cello while also calling attention to its difference from the other strings. To a careful individual, deepfake media exhibit obvious tells that illuminate its fictional origin, and the unusually low pitch of the fourth string alerts the audience to the cello’s changed tuning.

Just as the people using deepfake algorithms are wielding power over others by shaping their audience’s perception of truth, similar power dynamics exist within *Deepfake* as well. Many

¹³ Gillian Murphy and Emma Flynn, “Deepfake False Memories,” *Memory* 30, no. 4 (2022): 480.

¹⁴ Ibid.

¹⁵ Dawn Stover, “Garlin Gilchrist: Fighting fake news and the information apocalypse,” *Bulletin of the Atomic Scientists* 74, no. 4 (2018).

structural components of the piece are algorithmically generated—whether it is the specific synthesis methods in the electronics or random processes that blend musical material together near the end of the piece. The algorithmic confusion caused by these compositional devices mirrors the alleged information apocalypse caused by deepfakes.

As the composer, I maintain power over the audience's perception just as a would-be harmful agent creates false images through deepfake technologies. If they cannot distinguish between fixed media and live performance, they also cannot accurately assess musical attributes of the cellist. Without understanding a sound's source, they cannot develop their own opinions on the cellist's intonation or tone production or musical interpretation of the score. Therefore, the noise introduced by the construction of the piece fundamentally changes how the audience understands musical reality. By inhabiting the same structural power over the audience as a deepfake creator, I recreate, in abstract, the violence that deepfake media inflicts upon others and the collective reality that we share. I am in a similar position as Vivienne Jabri's understanding of artists who create works opposing war. She believes that artists working in opposition to war to a certain extent also aestheticize violence even if it is for humanitarian goals.¹⁶ I accept this role as an artist to illuminate the social challenges caused by deepfakes because I can focus on the disruption of the dissemination of truth rather than simply traumatizing the audience through demonstrations of the more heinous applications of deepfakes.

This piece exemplifies how the pressures of noise have guided my recent artistic works. *Deepfake* is structured around the tension between my standard artistic practice and the new

¹⁶ Vivienne Jabri, "War, the Aesthetic, and the Political" in *War and Aesthetics: Art, Technology, and the Futures of Warfare*, ed. Jens Bjerring, Anders Engberg-Pedersen, Solveig Gade, and Christine Strandmose Toft (The MIT Press, 2024), 51.

possibilities afforded by noise under any of its definitions. At the same time, noise exists within this piece only as “another type of instrumentation, a usable positivity and possibly a more satisfying and therefore less noisy noise.”¹⁷ Used in this fashion, the sounds are no longer noise: they are relegated to another form of musical expression. However, without the pressures of noise pushing me to rethink my orientations towards sound, I would not have been able to create the perceptual confusion caused by the various levels of imitation and electronic reproduction. Despite the piece not satisfying Hegarty’s understanding of noise, the noise-informed music that I created was better able to showcase the dangers of deepfake technologies than a musical practice that did not account for these other orientations towards sound.

3.

JEANNE

GOALS

jeanne is inspired by the life of Joan of Arc. While writing this piece, I was particularly interested in how the narrative of her life is told. Many primary documents about her life come from court proceedings during her 1431 trial for heresy and the 1455 posthumous rehabilitation trial. In each trial, the people recounting her story had a vested interest in portraying her in a certain way. After her death, the mythology surrounding her life as a religious figure took its own form as well (yet another version of Joan’s biography). At the center is an unknowable truth which is what actually happened. With each version of her story, different forces outside of Joan’s control alter how she is remembered. This piece seeks to investigate why history has

¹⁷ Hegarty, “Noise Not Music,” 83.

obscured certain aspects of her life while highlighting others and how this might be relevant to contemporary social structures.

MUSICAL STRUCTURE

TEXT

I constructed the text to mirror the goals of the piece both in what it says and how I wrote it. The text is an erasure poem that started as Margaret Oliphant's *Jeanne d'Arc: Her Life and Death*. According to Leung, "erasure refers to a poetic tactic in which a found text is erased—blackened out, whited out—and what remains is the new poem, emerged from the old."¹⁸ Authors who engage with this form are often working with explicitly political texts (e.g. Metre's *Sand Opera*, Levato's *A Continuum of Force*, Williams' *I am the Most Dangerous Thing*). Unlike these works, *jeanne* does not start from a political text. Instead, my erasures seek to highlight underlying political messages within Joan's biography. Normally, the erasure poetry "neither [documents] factual information like some strands of investigative or documentary poetry nor reframe found material by copying and reproducing it in a new context."¹⁹ This piece, however, seeks a third space that *almost* "[documents] factual information"²⁰ and *nearly* creates something new out of found text. The poetic language of *jeanne* explores a middle-ground between documentation and fiction. Schaefer continues by saying that "erasure turns redaction, a means originally reserved for the censorship of documents, into an aesthetic strategy for reworking

¹⁸ Leung, Muriel. "Erasure in Three Acts: An Essay," *Featured Blogger*. Poetry Foundation. October 31, 2021. <https://www.poetryfoundation.org/featured-blogger/85446/erasure>

¹⁹ Heike Schaefer, "Un/published: Presence and Absence in Contemporary Erasure Poetry," *American Literary History* 36, no. 2 (2024).

²⁰ Ibid.

found text.”²¹ Similarly, this piece exposes the censorship that Joan experienced by through the violence of erasure.²² The musical setting emphasizes these parallels between the poetic violence of blacking out Oliphant’s words and the silencing or amplifying different parts of Joan of Arc’s life.

Before beginning the erasure process, I compiled quotations from throughout the book into a new document based on the information it conveyed about Joan of Arc’s life or her personality. Then, I erased words and phrases from the set of quotations until the remaining words conveyed only an impression of Oliphant’s original meaning. I organized these words into lines and stanzas to create a new grammatical structure divorced from the words’ original context.

ELECTRONICS

The electronics in this piece all occur through real-time processes. They continually act as an outside force pushing against the voice, disguising or intensifying its sound. The electronics also alter how the audience perceives Joan’s position in time. Aside from the timbre of the singer’s voice, the electronics distance the general sonic landscape of the piece from sounds associated with a Medieval historical figure. The obviously synthetic sounds in the processing transpose the themes relevant to Joan of Arc’s life to the present day.

The processing consists of eight different effects that are continuously modulated and recombined throughout the piece. “Vocal dust” is a pseudo-reverb created with an FFT-based amplitude filter that emphasizes the quieter frequency ranges of the signal. These newly

²¹ Ibid.

²² Solmaz Sharif, “The Near Transitive Properties of the Political and Poetical: Erasure,” *Evening Will Come* 28, April (2013)

amplified frequencies are fed through a delay line to sound similar to reverb. Two spectral freeze effects randomly turn on and off to blur the sonic landscape and create an otherworldly sound. The spectral freeze output is, at times, augmented by a feedback loop constrained by a limiter which causes additional artifacts and glitches. The Max patch also creates short samples that are played back at random intervals. “Pitch tails” track the pitch of the singer and randomly match and sustain the recognized pitch using simple subtractive synthesis which adds to the breathy quality of the singer’s vocal technique. Single-sideband modulation shifts the pitch of the singer’s voice and adds bass frequencies at important moments of the piece. This is often employed in combination with feedback frequency modulation. All the electronic elements in the piece are spatialized in eight channels. The spatialization primarily serves to add physical movement to musical changes.

In addition to the realtime processing, there is also realtime synthesis in the form of a drone that vaguely imitates a vielle. There are four independent drones running simultaneously to create chords with up to four voices. Three of the voices center around the notes D, E, and A while the fourth voice moves freely to any pitch. This construction imitates the perfect intervals frequently found in bowed string instrument tunings with the added flexibility to modulate tonal centers along with the vocal line. Each drone voice consists of a violin sample played five times simultaneously at slightly different speeds. To mimic the improvisatory accompaniment of medieval vielle accompaniment, random processes occasionally add ornamentation to the drones using pitch shifting. The drone output is further processed with delay, a lowpass filter, and a basic reverb.

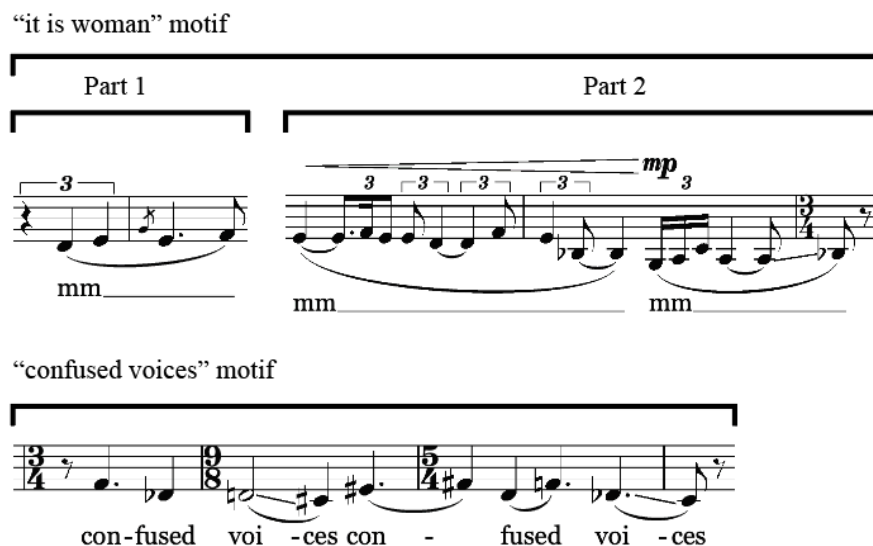


Figure 8: Motifs in *jeanne*

MUSIC

The piece relies on motivic construction to build coherence both within each section of music and throughout the piece. The first two excerpts in Figure 8 make up the “it is woman” motif. This name comes from the first few words of the erasure-derived text. They are considered two parts of the same motif for a couple reasons. In the opening of the piece, the singer sings both ideas using the words “it is woman” as she transitions from humming to singing. Throughout the piece, they are presented interchangeably and often appear together. The second motif, referred to as the “confused voices” motif, is the starting point for unstable music regarding Joan’s voices and people’s reaction to them. The final motif is identified through its constantly modulating and rising octatonic scales and accelerating rhythms. It is labelled as “octatonic intensification,” as it only appears when the musical drama is growing.

The piece divides into sections based on the themes of the text and the music used to express those ideas. The first 38 measures of the piece constitute the first section of the piece.

This music introduces one of the main themes of the piece: whether her story has been, at least in part, silenced or amplified for reasons outside of her control. The music throughout this section attempts to silence the singer in multiple ways. Both humming and singing with the mouth closed or covered represses the semantic meaning of the text. These techniques also diminish the resonance of the singer's voice limiting the possible dynamic range and ability to project. On the other hand, the singer is amplified. Her voice, no matter how quietly it leaves her body, can still reach the audience at an audible level. At the same time, the electronics resist her ability to communicate. The electronics can overpower the singer's amplified voice. As the processing grows in complexity, it also becomes more challenging for the listener to know whether the sound is coming directly from the singer or from the electronic processing. Destabilizing this relationship between sound and source mirrors the struggles to know where information comes from both during and after Joan's life. Were her voices from God? Do the primary sources regarding her life truthfully recount what happened during her life?

The harmonic structure gives the impression of Joan of Arc's time in multiple ways. The pitches are derived from the pitch set [01356] which has strong modal implications. Working from a pitch set rather than a harmonic structure more similar to music of the Middle Ages gave me additional freedom to move between more distantly related tonal centers. Therefore, the music hints at both contemporary and historic sounds. This helps accomplish the goal of translating themes from the life of Joan of Arc to the present day.

Melodically, I drew particular inspiration from the secular songs of Guillaume de Machaut, an important French composer who wrote in the *ars nova* style at the end of the Middle Ages. Rather than attempting to understand the music as it was conceptualized in its time, I

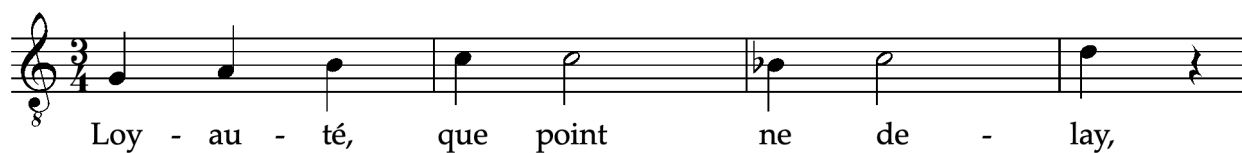


Figure 9: Opening of Machaut's "Loyauté, que point ne delay"

Figure 10: Opening of Machaut's "Pour ce qu'on puist"

examined his music for salient features that signal to contemporary listeners the sound of the Middle Ages. I recontextualized the sound of musica ficta into my pitch-set-derived melodies. For instance, the beginning of Machaut's "Loyauté, que point ne delay" uses both B natural and B $\flat$ in quick succession which gives modern listeners the impression of modal mixture. Or, in "Pour ce qu'on puist," the first stanza seems to float between G and D modal centers. When the melody switches from F to F $\sharp$, B to B $\flat$, or E to E $\flat$, the changed pitch adds harmonic color.

Similarly, B $\flat$ and A $\flat$ first appear in *jeanne* in measure 32 after repeatedly emphasizing B and A in the opening of the piece. These chromatic cross-relations create tension within a relatively static sonic landscape.

The electronics also connect this music back to the sound of Joan of Arc's time. The droning accompaniment and "vocal dust" pseudo-reverb recall the sounds of a vielle and the cavernous acoustics of churches or royal halls. Neither effect produces a truthful replica of medieval sounds. Instead, they only give an impression of those sounds to remind the audience of the dubious veracity of Joan's biography and the historical conditions that inspired this piece.

Just as text drives the structure of the piece, it likewise informs small-scale musical decisions. In measure 17, when the voice switches from humming to singing, both the register and pitch center change to emphasize the text. Similarly, the music modulates on important words in the text such as "imagination" in measure 34 and "dreams" in measure 37. The modulation in measure 37 has the additional function of signaling the beginning of the next section of music.

The image shows a musical score for measures 32 to 36 of the piece *jeanne*. It consists of two staves: Voice and Elec. (Electronics).

Voice Staff:

- Measure 32: Starts with a box labeled 'C' and 'mouth uncovered'. The note is G4, followed by a triplet of A4, B4, and C5. Dynamics: *f*.
- Measure 33: Starts with a triplet of D5, E5, and F5. Dynamics: *f*.
- Measure 34: Starts with a triplet of G5, A5, and B5. Dynamics: *f*.
- Measure 35: Starts with a triplet of C6, B5, and A5. Dynamics: *pp*.
- Measure 36: Starts with a triplet of G5, F5, and E5. Dynamics: *mf*.

Elec. Staff:

- Measure 32: 4/4 time signature, followed by a 7/8 time signature.
- Measure 33: 7/8 time signature.
- Measure 34: 4/4 time signature.
- Measure 35: 4/4 time signature.
- Measure 36: 4/4 time signature.

Annotations:

- Cue 5:** B $\flat$ drone (located between measures 33 and 34).
- Cue 6:** drone gliss (located between measures 35 and 36).

Lyrics:

im-poss-i-ble pass-ion of the i-ma-gin-a-tion-nn so hum-ble mm__ yet

Figure 11: measures 32 to 36 of *jeanne*

This section continues from measure 38 to measure 74. This section follows Joan's emotional trajectory from being afraid of her voices to being empowered by their commands. Like the first section, the music closely follows what the text is saying. The piece uses chromatic harmony to discuss more turbulent topics. The motif that expresses her initial confusion about the source of her voices comes from the [0145] pitch set. The electronics shift from mostly drone sounds to vocal processing connecting the voice of the singer to Joan's voices. Part of this processing is live sampling. By randomly replaying small chunks of music outside of their original context, it disrupts the musical present with conflicting ideas of the past. This further investigates whether her story has been at least in part silenced or amplified for reasons outside of her control.

Despite the new affect and harmonic structure, the melodic contours are still similar to those from the opening section. The melodies tend to be restrained in range and often emphasize small leaps and half step resolutions at the ends of phrases. The music only stops this behavior for dramatic effect. As the piece grows, it switches to the octatonic intensification motif. This leads to the most rhythmically active music and highest sung pitches in the piece so far.

Similar to the first section, this section uses vocal timbre as text painting. While singing about her "confused voices," the score calls for "breathy sprechstimme." The singer's unfocused tone combined with the electronic processing heightens the feeling of uncertainty. In measures 50 and 53, the singer awakens her voice by slowly uncovering her mouth while singing the word "awakened."

The third (measures 75 to 93) and fourth (measures 94 to 137) sections of music follow slightly different structural logic compared to the first two. Rather than introducing an entirely

new motif in the third section, most of the music in this section is a synthesis of material from the previous two sections. In fact, starting at measure 75, the music is a rough interpolation between the “it is woman” and “confused voices” motifs. It begins with the first four notes of part 1 of “it is woman,” yet it ends with half step glissandi similar to the end of “confused voices.”

In section four, there is musical material that is not classified as one of the stated motifs. This material falls into two categories. The first category is harmonically similar to previous music; however, it emphasizes larger dramatic leaps. For example, measures 92 and 93 are related to the “it is woman” motif with more disjunct motion in measure 93. This music, in combination with the octatonic intensifications, serves as another way of heightening the drama within the piece. The second category is the rhythmic whispering from measures 111 to 126. The whispered words come from the inscription on Joan’s pyre as she was burned at the stake: “JEANNE CALLED THE MAID, LIAR, ABUSER OF THE PEOPLE, SOOTHSAYER, BLASPHEMER OF GOD, PERNICIOUS, SUPERSTITIOUS, IDOLATROUS, CRUEL, DISSOLUTE, INVOKER OF DEVILS, APOSTATE, SCHISMATIC, HERETIC.”²³ This technique only happens at this critical moment of the piece to highlight its importance. Notably, the heavy processing emphasizes the inharmonic qualities of whispered speech making this the noisiest moment in the piece.

²³ Margaret Oliphant, *Jeanne D'Arc: Her Life And Death* (G.P. Putnam's Sons The Knickerbocker Press, 1896), 394.

WHAT IS IT?

Displacement is a sound installation that explores the impact of the military on the surrounding civilian communities within San Diego. During the installation, field recordings of fighter jets flying over the city are played directly into metal plates using transducers. The vibrations shake dirt, broken flowerpots, and cinder block fragments on the plates. The moving particles create additional noise as they crash against the plates intensifying the violence of the sounds. Rangefinder sensors control further manipulations of the sound based on the audience's proximity to the metal plates. Other sounds are also diffused through 16 speakers around the perimeter of the space. These sounds include processed versions of the field recordings as well as sine tones pitched at prominent frequencies found in those recordings. Through the action of displacement, the piece questions how the military disturbs human and natural landscapes as witnessed through the sounds the military creates.

GOALS

One of the affective goals of the piece is for the audience to feel surrounded, overwhelmed, and consumed by sound. I accomplish this primarily through two parameters: volume and spatialization. The volume of the installation creates a constant minimum intensity: the sound never stops to allow for quiet contemplation. When the metal plates vibrate at their maximum volume, the rattling from the found objects is very unpleasant. Combined with the unpredictable nature of the installation's behavior, it quickly becomes overwhelming. There are no discernible patterns for how sound moves through the space. The sound from the plates is contingent on interaction: a rangefinder might detect a new audience member causing the

installation to alter its behavior and to create sounds from a different location in the space. Additionally, the fixed media is spatialized through random processes which are constantly in motion and never predictable. This simulates the sensation of planes flying overhead as if surveilling the audience or preparing for an airstrike. Even without the threat of actual violence, such “sound bombs”²⁴ can have dire repercussions. According to Goodman, fear caused by sound alone “becomes autonomous from the need to back it up” and is “perhaps all the more powerful for its spectral presence.”²⁵ These sounds, recorded and removed from the machines that made them, maintain a specter of violence through their representation of the possibility of military engagement.

Another goal of this piece is to inspire deeper considerations of otherwise ignored sounds. Drawing on the site-specific nature of the piece, it forces listeners to consider sounds that are a part of their everyday life within a new context. The seven military bases in the city of San Diego²⁶ station over 115,000 active-duty service members.²⁷ Of these bases, Naval Base Coronado, Marine Corps Air Station Miramar, US Coast Guard Sector San Diego, and Marine Corps Base Camp Pendleton all have aircraft at their facilities. Based on reporting from NBC 7 San Diego and social media threads on Reddit, fighter jets flying in and out of MCAS Miramar and the Brown Field Municipal Airport (a public airport that also allows military air traffic) cause many of the complaints and concerns. This disruption, according to Lea Sutton, is

²⁴ Steve Goodman, *Sonic Warfare: Sound, Affect, and the Ecology of Fear* (The MIT Press, 2010), xiii.

²⁵ Goodman, *Sonic Warfare*, xiv.

²⁶ “Military Installations,” The City of San Diego, accessed June 22, 2026, <https://www.sandiego.gov/veterans/military-installations>.

²⁷ “Military in San Diego,” San Diego Military Advisory Council, accessed June 22, 2026, <https://sdmac.org/military-in-san-diego/>.

affectionately regarded as “the sound of freedom.”²⁸ The fact that this phenomenon has a nickname suggests that many people have simply accepted the noise of the military as a part of their daily lives. The normalization of military activities within the city makes it easy for civilians to forget how it impacts their daily lives and environments.

Daughtry coined the term belliphonic for the sounds of war and its related activities. He proposes that those sounds are often “coded as noise, as something to be “tuned out” to the extent possible.”²⁹ In the context of *Displacement*, this orientation reflects daily life in San Diego surrounded by military infrastructure: civilians have “developed techniques for listening to these sounds...while simultaneously striving to minimize their deleterious effects.”³⁰ Presenting this piece in San Diego, many of the audience members are familiar with the sounds of fighter jets, as these airplanes frequently fly over civilian neighborhoods during training. Following Daughtry further, people quickly switch modes of listening “when people [deem] the sounds of armed conflict to contain useful information.”³¹ *Displacement* hopes to spur the first mode of listening to access the second. By doing so, the sounds of the installation achieve dual status: noise as an energetic sound that vibrationally disturbs its surroundings and as a signal that “[contains] useful information”³² regarding armed conflict. Appropriating the sounds of the military within a work of art, this useful information shifts from tactical or survival cues for combatants to political investigations of sound for the general population.

²⁸ Lea Sutton, “Sounds of F/A-18s Disturb Some Residents,” *NBC 7 San Diego*, September 4, 2013, <https://www.nbcsandiego.com/news/local/fa18s-sounds-brown-field-otay-mesa-residents/2077343/>.

²⁹ J. Martin Daughtry, *Listening to War: Sound, Music, Trauma, and Survival in Wartime Iraq*, (Oxford Academic, 2015) 34.

³⁰ Daughtry, *Listening To War*, 33.

³¹ Daughtry, *Listening To War*, 34.

³² Daughtry, *Listening To War*, 34.

This shift is reinforced through play. By engaging with the rangefinders to manipulate sounds, the installation acts as an instrument to explore the repercussions of vibration. The proportional and easily understandable relationship between physical distance from the rangefinders and sonic result invites audience members to play with the installation. This change from passive observer to active participant inspires a similar modification in thought process regarding the sounds in question—from ignored nuisances to significant sounds with social and political meaning.

As people move closer to the installation, the rangefinder sensors indicate for the transducers to vibrate the plates more intensely. By the time the audience is standing directly over the installation, the sound is grating and uncomfortable. The discomfort caused by the noise pushes the audience back and dissuades them from exploring the nature of the work. Similarly, people who criticize or report on problems with the military are often met with hostility and retribution. Through play, the installation reproduces this same behavior illuminating the challenge of questioning the military's behavior and its repercussions.

The visual language of the installation illustrates how these sounds either directly or indirectly contribute to civilian displacement. Most of the found objects (flower pots, cinder blocks, dirt) are broken in some way. This implies that it was the physical force of the sound or the weapons that created those sounds that broke them. These objects signify what is left behind after a military strike or what remains of domestic communities alienated by the military. Therefore, both visually and sonically, the installation reminds the audience of how the military displaces people through obvious attacks and other more subtle reminders.

Jabri points out, through her commentary on Goya and Dino and Jake Chapman, that aestheticizing violence, even as a method to oppose war, suggests a level of complicity with violence.³³ *Displacement* implements multiple strategies to counteract her assertion. Visually, there are no traces of the military hardware or design. It takes the opposite position of Marinetti's assertion that the architecture and engineering of war is beautiful by purposely removing any visible traces of military craftsmanship.³⁴ Instead, the piece focuses on what is broken or left behind. From a sonic perspective, replaying the sound of fighter jets might, at first glance, seem to emphasize the spectacle of war. On the other hand, these sounds were recorded within domestic spaces where people know they are safe from the violence of these aircraft. Additionally, all of the recordings were taken during my daily activities. I never sought out locations to specifically record the sounds of aircraft. Therefore, the audience is forced to confront the cognitive dissonance in the similarity between the sounds of war and the sounds of their daily lives within San Diego. Jabri also points out that one of the strengths of Goya's *No se puede saber por qué* is that it does not offer one specific interpretation; instead, it begs for "a conceptual engagement with war, one rendered in visual form, provoking a rethinking of war in a revolutionary, and nationalist, age."³⁵ The elements of play within this piece invite the audience to engage with the concepts at hand on their own terms. The various relationships built into the installation connecting proximity with volume, sonic character, and motion of the found objects allow for the audience to draw new conclusions about what these previously everyday sounds mean to them.

³³ Jabri, "War, the Aesthetic, and the Political," 56.

³⁴ Jabri, "War, the Aesthetic, and the Political," 55.

³⁵ Jabri, "War, the Aesthetic, and the Political," 58.

TECHNICAL DETAILS

The content playing through each metal plate is independently calculated in real time. A Max patch randomly chooses an audio sample to play out of a library of 31 different recordings of fighter jets flying over San Diego. The raw sample signal is then fed through a delay line and a lowpass filter. The sound is proportionally modulated based on the information collected by the rangefinder sensors. For the five plates closest to the Arduino, the processing always uses the smallest distance measured by one of the two sensors adjacent to the metal plate. For the plates farther away from the Arduino, the plates only rely on information from the one rangefinder that points in its direction. As audience members approach the rangefinder sensors, the sound modulates more dramatically. The processing controlled by these sensors consists of an FFT-based amplitude filter, overdrive, another lowpass filter, and a flanger in that order. Finally, the rangefinder controls the output volume—increasing the volume as people approach the plate as if to displace the audience from the work itself.

The fixed media is generated algorithmically using the same field recordings of fighter jet sounds. They are similarly selected randomly and processed with delay, lowpass filtering, and overdrive. Then, the stereo channels are broken apart and spatialized independently using channel-based equal-power panning. The sound randomly moves between speakers, never repeating a speaker before sound has traveled to every speaker. Every time the sound moves, it takes a random integer number of seconds (between 1 and 20) to pan from one speaker to the next.

Other aspects of the fixed media are synthesized from the jet sounds. I built a library of “frozen samples” by processing the jet sounds with a spectral freeze effect and tight bandpass

filters highlighting prominent frequencies. Like the field recordings, the “frozen samples” are also played back randomly. The last component of the fixed media is sine tones. These sine tones are pitched at the same frequencies as the bandpass filters; however, this does not necessarily happen at the same time. Each sine tone plays for a random duration that is always some integer length between 20 and 35 seconds. They fade in to a random amplitude before fading out again. The amplitude is further modulated by a slow-moving LFO. The output is sent to a very long delay line to create unusual spectral harmonies. Each delay is pitch shifted at a randomly selected ratio between 0.995 and 1.005. Finally, both the frozen samples and the sine tones are spatialized using the same random process as the jet sounds.

5. APPENDAGES

WHAT IS IT?

This piece is a reed quintet inspired by a video created by bass clarinetist, Jeff Anderle. In the video, he attaches his bass clarinet mouthpiece to progressively longer pieces of PVC pipe in an attempt to play notes below the range of human hearing.³⁶ The low fundamental pitch yields surprising sonic results. Although humans cannot hear the fundamental frequency, they can hear the unusual interactions between the upper harmonics. When the opportunity arose to write for Jeff and his ensemble, Splinter Reeds, I wanted to explore the musical possibilities of this instrument. In this piece, Jeff plays an approximately 17 foot long PVC bass clarinet tuned to C0, and the clarinetist plays a smaller PVC clarinet tuned at a ratio of 7:2 with the larger instrument (31 cents below B♭1).

³⁶ For those interested in watching the video, it can be found at this link: <https://www.tiktok.com/t/ZTB3Qpxx4/>

GOALS

Appendages investigates the musical possibilities of the PVC pipe instruments and how an ensemble of traditional instruments can augment those timbres. The ensemble imitates various aspects of the sound of the PVC bass clarinet and the physical actions required to play it. The piece appropriates sonic characteristics of the PVC bass clarinet as motivic elements to construct musical material. The imitation goes so far that the PVC bass clarinet even imitates its own imitations. Musical material moves from simulation to simulacra because the imitations of imitations no longer contains any vestiges of the original.³⁷ Therefore, noise seeps into the musical form of the piece creating self-referential feedback between the sound of the PVC bass clarinet, its imitations in the ensemble, and the imitations of the imitations.

MUSICAL STRUCTURE

Because the fundamental pitch of the PVC bass clarinet is so low, the timbre sounds like a series of repeating transients. The ensemble imitates this sound through a variety of techniques. Saxophone slap tongue and bassoon flapping³⁸ copy the percussive and rhythmic qualities of the transients. Other forms of transients occur through abrupt cutoffs. The smaller PVC clarinet goes one step further: the performer stops the sound by plugging the end of the pipe with their finger to physically cut off any resonance.

The rhythmic imitations of the PVC bass clarinet are an important musical motif. In the opening gesture, the saxophone slap tongues smoothly decelerate from sixteenth notes to quarter note triplets. At the same time, the bassoon flaps move from sixteenth note sextuplets to quarter

³⁷ Baudrillard, *Simulacra and Simulation*, 6.

³⁸ Not to be confused with slap tongue; for more information on the flap technique, consult Pascal Gallois's *The Technique of Bassoon Playing*.

♩ = 60
air
no reed

Oboe

mf *pp*

Clarinet Mouthpiece
With Tube

articulate all
staccatos using finger
at the end of the tube

f *pp*

Alto Saxophone

slap
no pitch

mf *pp*

Bass Clarinet Tube

slap
no pitch

f *pp* *mp* *pp*

air

Bassoon

flap

6 5 3

mp *ppp*

Figure 12: Opening Gesture of *Appendages*

note triplets. The overlapping subdivisions of the beat allow for more individual attacks per beat than either instrument could accomplish alone—more closely replicating the speed of the bass clarinet pipe transients. This motif develops through its expansions and contractions in one instrument and its different interactions with simultaneous iterations of the motif throughout the ensemble.

The low fundamental frequency creates many more audible high harmonics which, in turn, produces a more complex frequency spectrum. The ensemble builds on this with layers of multiphonics. These sounds allow for denser harmonies and more complex timbres than single-note tone production alone. The bassoon also accomplishes this through “Berio tremolos”³⁹

³⁹ For more information about this performance technique, consult Pascal Gallois’s *The Technique of Bassoon Playing*.

which are rapid oscillations between the lowest register of the instrument and notes above middle C to create a noisy sound that distorts the actual fingered pitches (reminiscent of harmonic trills on string instruments).

The PVC pipe's immense length requires substantial quantities of air to produce sound. This quality is further reinforced by the air sounds mostly played through a reed-less oboe and the PVC bass clarinet itself. Breath also shapes the construction of musical ideas throughout the piece. Often music occurs in one of two possible configurations: a fade in followed by a fade out as if inhaling then exhaling or one long decrescendo like a single forceful exhale.

The PVC instruments have no keys or buttons meaning that pitch content is limited to only the fundamental pitch and its harmonic series. The oboe, bassoon, and saxophone likewise occupy fixed harmonic spaces, as their multiphonics are only possible on particular notes and cannot be transposed. This means that musical motion must be created through other sonic parameters besides pitch. The pair of PVC instruments often interact in overlapping cycles of crescendos and decrescendos. The shifting balance between the two instruments pushes the music forwards without the need for additional harmony. Musical motion also occurs through changes in timbre. The performers move through different phases of sonic intensity ranging from air sounds to normal tone production to chaotic multiphonics. These different intensities are further shaped by other performance techniques like metered bisbigliando, changing multiphonic voicings, and flutter tongue.

While the properties discussed up to this point stem outwards from the PVC bass clarinet, the relationship between sound and imitation flows in many directions throughout the piece. The oboe loosely copies the bassoon's Berio tremolos with tremolos of its own; however, the oboe

tremolos do not have the same distorted timbre as the Berio tremolos. The timbre of the Berio tremolos is the defining characteristic of the technique that relates it back to the sound of the PVC bass clarinet. Following Baudrillard, the oboe part is a simulacrum of the PVC bass clarinet because the oboe does not accurately replicate the Berio tremolos which are themselves imperfect representations of the sound of the PVC bass clarinet.

The PVC bass clarinet copies its own reproduction through staccato repeating notes, slap tongue, and the decelerating motif. This reflexive move makes it difficult to distinguish imitation from original. The copy of a copy changes the relationship between original and imitation. It is now two ideas that are transformations of each other because hints of the first exist in the second and hints of the second in the first. Because there is no longer an authentic original sound, this reflexive property is a source of formal and perceptual noise. Relationships that were once audible are now confused by the piece's self-referential nature.

Unlike the other musical works in this portfolio, this piece is not necessarily written with a sectional form. Rather, the piece is structured through the interactions between the different properties described above. As the piece progresses, ideas advance and recede from the foreground. The behavior of the PVC bass clarinet acts as a backbone around which the music changes. The opening of the piece demonstrates this in its simplest form (see Figure 12). The PVC bass clarinet begins the piece with a loud slap tongue followed by a long decrescendo. The ensemble directly imitates this behavior. The oboe starts the piece with a puff of air exaggerating the amount of breath support required to play the PVC bass clarinet. Both the alto saxophone and bassoon use percussive extended techniques to copy the crackling transients of the PVC bass

clarinet. Their timbral imitation contains the same gestural shape as their oversized counterpart—decreasing in both rhythmic and dynamic intensity.

By measure 12, the texture settles into a slowly pulsing drone constructed from overlapping patterns of swells in the two PVC clarinets. The PVC bass clarinet, over the span of one whole note, moves from piano to forte to piano again. This repeated and regular motion provides temporal grounding for the changing texture on top of it. The second pattern in the smaller PVC clarinet consists of a whole note, dotted half note, and half note. This three-note pattern is super-imposed on a four note pattern of dynamic changes: pianissimo to forte to pianissimo to mezzo piano to pianissimo. Each crescendo or decrescendo is exactly one note long independent of the note's length. The polyrhythmic construction between note length and dynamics creates a constantly changing musical texture using only one note on one instrument.

As the droning continues, the sound of the PVC pipes moves to the background, and the imitations and reproductions of their physical properties become more important. Until measure 27, percussive extended techniques and air sounds constitute the majority of these imitations. In measure 26, the PVC bass clarinet plays a low multiphonic while crescendoing to forte. This is immediately copied by the bassoon in measure 27. The noisy timbre of the Berio tremolo simulates the sound of the multiphonic in the previous measure. Similarly, the bassoon repeats the same crescendo. This is the first instance where another instrument attempts to copy the complex timbres associated with the PVC bass clarinet's multiphonics. Throughout the piece, Berio tremolos and multiphonics in the alto saxophone and bassoon are the most prominent reinterpretations of the PVC bass clarinet multiphonics.

The oboe plays a slightly different role within the ensemble. When the oboe first plays with the reed attached in measure 29, it introduces a rhythmic idea that competes with the musical imitations of the PVC pipe instruments for the musical foreground. This idea is often performed on a single pitch while the player rhythmically moves between different fingerings. It expands on the importance of musical development with limited pitch material. The changing fingerings add subtle variations in tone quality which support development through manipulations of timbre.



Figure 13: Oboe Rhythmic Motif Starting in Measure 29

Whereas the saxophone multiphonics have strong harmonic implications, the oboe multiphonics act as timbral intensifications. For example, in measure 35, the oboist slowly adjusts their teeth on the reed to cause a single note to bloom into a multiphonic. The shift from single note to multiphonic is always played with a crescendo, and the shift from multiphonic to single note is always played with a decrescendo. The PVC bass clarinet behaves similarly when it slowly shifts between embouchure voicings to emphasize different partials. In this way, the oboe imitation of the PVC bass clarinet expands on the idea of musical development through timbre while using a limited harmonic palette.

Although harmony is not a primary concern within this piece, the oboe does play a critical role in the slow harmonic journey throughout the first half of the piece. During this portion of the piece, the music slowly rises from C to E. The PVC bass clarinet fundamental is a

low C. The oboe first enters droning on a C with its competing rhythmic idea. The lowest notes of two of the prominent alto saxophone multiphonics are also C. Eventually, the alto sax adds Db in measure 31. The oboe loudly moves to Eb in measure 48. When the oboe and alto saxophone land on unison E's in measure 53, there is a structural harmonic resolution. This is amplified by the removal of the PVC clarinets. Measures 54 to 61 are the only moments when both PVC instruments are not playing. Without the musical backbone that has supported the piece up to this point, the sustaining oboe and saxophone fulfill that function instead.

After the structural resolution, the piece continues growing in different ways. The harmony is less rigidly controlled with new multiphonics introduced in the oboe and alto saxophone. The tempo changes with the shifting intensity of the piece. It increases twice as the piece becomes wilder. Then, a long ritardando relaxes the piece to the ending. Starting in measure 90, the PVC bass clarinet combines many of the relevant characteristics of the piece into one gesture of repeated quarter notes. It develops the droning behavior from the beginning of the piece through the long swelling dynamics. It manipulates the timbre of the PVC bass clarinet through voicing changes, and it emulates the transients within its own timbre through strong articulations. Finally, the piece ends with a brief recapitulation of the droning PVC instrument behavior combined with percussive articulations in the alto saxophone and bassoon. By ending the piece in this fashion, it emphasizes how the piece is singularly constructed around the properties of the PVC instruments.

6. CONCLUSION

Through these works, I have outlined how my practice traverses different understandings of noise. Each definition provides unique pressures on my musical practice to explore my own

relationship to my craft in different ways. Both *Deepfake* and *Appendages* are inspired by the noisy possibilities of altered and augmented musical instruments. Noise, in this context, is understood as a timbral property. Rather than thinking about the instruments' sonic products as noise, the unstable and noisy properties of the manipulated instruments required me to explore new methods of composition that I had not previously examined. In this fashion, noise pressured me to find new modes of musical expression.

jeanne and *Displacement* draw inspiration from the political stakes of noise. Both *jeanne* and *Displacement* build from Attali's notion that the control of noise signals political priorities. *jeanne* translates this idea into a poetic and musical process through erasure poetry and electronic processing to examine how history silences and amplifies different aspects of the life of Joan of Arc. On the other hand, *Displacement* shows the military's ability to create sound in civilian spaces. The normalization of military sound as a part of everyday civilian life highlight societal priorities in San Diego. Both pieces use their sonic properties to illuminate the politics of their material by learning from Attali's explanations of noise.

In the process of demonstrating these seemingly disparate pieces' relationships with noise, I have found previously hidden connections within my artistic oeuvre and discovered new avenues for future artistic exploration. For example, I noticed similar translations of Baudrillard's simulation and simulacrum in older works such as *Slow Burn* for clarinet and electronics, *article iii* for brass quintet and electronics, and *Chance, Or Fate* for electric guitar, piano, and electronics. In all of these pieces, however, the movement from simulation to simulacrum is a developmental technique secondary to other musical or programmatic structures. A future piece might be entirely built out of chains of imitative relationships where each

successive imitation contains less and less representation of the original until the music becomes entirely simulacrum.

Hegarty's definition of noise challenged my understanding of music, sound, and noise the most. My compositions tend to be tightly controlled with preplanned and ordered musical events taking place in designated concerts which is directly opposed to Hegarty's assertion that "noise in music is, therefore, as much about when as what."⁴⁰ Additionally, he would argue the noise-like features of my music come from attempts to make noise a part of the instrumentation of the piece. This is why the overarching concern of this dissertation is about learning from noise and how these behaviors might change my personal musical practice. Within the context of institutionalized new music, I cannot make noise. I can, however, learn from it to challenge my own preconceived artistic beliefs just as noise challenges the primacy of a message.

⁴⁰ Hegarty, "Noise Not Music," 74.

SCORES

deepfake

for cello, fixed media electronics, and video

Aaron Mencher

deepfake

dedicated to Robbie Bui

for cello, fixed media electronics, and video

duration: 12 minutes 50 seconds

Technical Specifications

The cello must tune the C string down one octave. The score is written using the fingered pitch. All notes played on the fourth string will sound an octave lower than written.

The fixed media is mixed in stereo. The volume of the electronics and the cello should be approximately equal. Some minor sound reinforcement of the cello might facilitate optimal blending and balance between the electronics and the cello. It is strongly suggested that the performer uses a click track to best align the live performance with the fixed media.

for Robbie Bui
Deepfake

Aaron Mencher

♩ = 52

Violoncello

8

6

ppp

pp

ppp

n

pp

14

6

7

7

A

IV

-31

IV

p

ppp

p

ppp

22

II

B

ord

msp

-31

III

IV

pp

ppp

pppp

<p

pp

<p

pp

28

ord

6

6

7

7

ord

mp

p

mf

p

ppp

mf

ppp

34

msp

ord

6

7

3

C

6

6

7

7

IV

III

mp

sfz

mf

ppp

p

n

40

-31

3

-31

p

mf

p

ppp

mf

p

mf

46

D

III

5

5

6

6

5

6

f

pp sub.

2

Slightly Faster

♩ = 60

51 Vc. $\text{IV} \text{ -31} \text{ -31} \text{ IV} \text{ -31} \text{ -31} \text{ 3} \text{ -31}$
 $\text{< } p \text{ } ppp \text{ < } mf \text{ > } p \text{ } mf \text{ > } p \text{ } ppp \text{ < } mf \text{ > } p \text{ < } mf \text{ > } p \text{ } mf$

57 Vc. $\text{5} \text{ 3} \text{ -31} \text{ 3} \text{ -31} \text{ 3} \text{ -31} \text{ 3} \text{ -31} \text{ IV}$
 $f \text{ } ff$

61 Vc. $\text{III} \text{ -31} \text{ I} \text{ 3} \text{ -31}$
 $p \text{ sub.} \text{ } mf \text{ } sfz \text{ } p \text{ } f$

65 Vc. $p \text{ < } f \text{ } p \text{ < } f \text{ } p \text{ < } f \text{ } f \text{ 6} \text{ 7 IV}$
 grittier each time ————— allow F to speak normally

69 Vc. IV continuous, noisy
 $ff \text{ 6} \text{ pizz. arco no vib. } ppp \text{ sub.}$

73 Vc. $\text{vib.} \text{ -31} \text{ } p$

77 Vc. $\text{msp} \text{ -31} \text{ } pp \text{ } mp \text{ } pp \text{ } f \text{ } mp \text{ } \text{ord} \text{ -31} \text{ -59} \text{ -31} \text{ -59} \text{ -31}$
 $G \text{ } \text{ord} \text{ -31} \text{ -59} \text{ -31} \text{ -59} \text{ -31}$

Vc. 82 -59 no vib. white noise tone no vib. ord ----- msp
vib. I

pp *ppp* *pp* *f* *pp sub.*

H

Vc. 89 ord -31 -59 -49 -31 -31 -59 -59

mp *n* *p* *n* *mp* *mf*

Vc. 93 3 -31

p *mp*

I

Vc. 97 ord ----- msp -59 -31 -59 -49 -31

f

Vc. 102 -31 -59 white noise

n *pp*

Vc. 107 msp ----- ord -49

mp

Vc. 110 -31 -59 -31 -49

6 *6* *6*

4

113 ⁻⁴⁹ J ³ _{mf sub.} $\longrightarrow$ *p* *mf* ³ ₆

Vc.

115 ⁻³¹ ⁻⁴⁹ ⁻⁴⁹ ⁻³¹ ⁻³¹ $\longrightarrow$ *p* *mf* $\longrightarrow$ *p* *mf* $>$ *p* *mf* $>$ *p* *mf* $>$ *p*

Vc.

119 ⁻³¹ ⁻⁵⁹ ³ ^{ord} $\dashrightarrow$ ^{msp} ^{II} ^{III} ^{ord} ⁻³¹ ⁻³¹ ⁻³¹ ⁻⁵⁹ ⁻³¹ ⁻⁵⁹ $\longrightarrow$ *mf* $\longrightarrow$ *f* $\longrightarrow$ *p* *f*

Vc.

124 ⁻³¹ ⁻⁵⁹ ³ K ⁶ ^{msp} ^{fast} $\dashrightarrow$ $\longrightarrow$ *ff* $\longrightarrow$ *pp* *n*

Vc.

135 $\dashrightarrow$ ^{ord} ^{none} L ⁻⁴⁹ ⁻³¹ ^{msp} $\dashrightarrow$ *mp* $\longrightarrow$ *f* $\longrightarrow$ *ff* *disjointed*

Vc.

139 ^{ord} ⁻³¹ ⁻⁴⁹ ^{msp} ^{ord} ⁻³¹ ^{msp} $\dashrightarrow$ *ord* *ord* *ord*

Vc.

142 ^{msp} ^{ord} ⁻³¹ ^{ord} ⁻³¹ ⁻⁴⁹ $\dashrightarrow$ *msp* *ord* *ord*

Vc.

jeanne

for voice and live electronics

Aaron Mencher

jeanne

dedicated to Julia Cordani
for voice and live electronics
duration: 9 minutes 40 seconds

Technical Specifications

The electronics are controlled using Max MSP 9. This piece requires IRCAM's SPAT library plus additional sound files provided by the composer. These sound files must reside in the same file folder as the Max patch for the patch to function properly.

For the vocalist, the premiere performance used a handheld dynamic microphone; however, the final mic choice should be made by the singer in consultation with the sound engineer. It might also be worthwhile to use a pop filter.

The piece was originally written with the electronics spatialized in eight channels with the first channel located at 0°. Each channel should follow consecutively in a circle separated by 45°. If the performance venue cannot handle eight channel spatialization, please contact the composer to make the appropriate modifications to the Max patch.

Performance Notes

In this piece, the voice is required to sing from A₃ to A₅. The singer should not use a full operatic voice for the duration of the piece. Rather, the vocal timbre should grow and contract with the piece itself using vibrato as an expressive effect. The humming should be resonant and not throaty. The sprechstimme should still convey the written pitch material. When the singer is designated to cover their mouth, the sound should maintain the same intensity but with a swallowed character, as if fighting to break out of their body. For additional questions regarding the piece or its interpretation, please contact the composer at aaronmencher@gmail.com.

for Julia Cordani
jeanne
 for voice and live electronics

Aaron Mencher

♩ = 60

Voice

pp *p* *pp*

mm mm mm mm

Cue 1: vocal dust

Cue 2: D drone

Electronics

4/4 2/4 4/4

9

A

p

mm mm mm mm

Cue 3: E drone

Elect.

4/4

15

mp *mf* **B** *p* *mp*

mm mm it is wo-man mm it is

Cue 4: spectral freeze A drone

Elect.

3/4 4/4

21

p *mf*

mm mm it is wo → mm mm mm mm

slowly close mouth

Elect.

3/4 4/4

2

27

Voice

mm an nn nn i... m.. im-poss- i...

Elec.

7 8 2 4

p *mf* *p*

mouth covered

C

32

Voice

im-poss-i-ble pass-ion of the i-ma-gin-a-tion nn so hum-ble mm yet

Elec.

4 7 4

f *pp* *mf*

Cue 5: B> drone

Cue 6: drone gliss

37

Voice

full of mm full of dream → mm - [z] mm mm mm

Elec.

5 4

f *pp*

slowly close mouth

Cue 7: add samples

43

Voice

con-fused voi-ces con-fused voi-ces voi-ces voi-

Elec.

3 8 5 4

p

sprechstimme
breathy

breathy

Cue 8: pitch tails
freeze settings change
drone fade

D

singing mouth covered normal sprechstimme mouth uncovered breathy singing mouth covered normal

49 *mf* 3 *p* 3 3 3 3 3 3 *f* 3

Voice - ces a - wa- kened mm a - wa

Elec. 4/4 5/4 3/4 4/4

mouth uncovered

54 *f* 3 5 3 3 3 *ff*

Voice a-wa - kened her se-cret hea - ven con-fused voi-ces her wild-est and strang est Maid God

Cue 9:
all samples
pitch tails cresc.

Elec. 4/4 5/8 2/4 8/12 4/4

59 Long **E** *p delicate* 3

Voice Maid God Her star, the sun-shine an an-gel to her

Cue 10:
long fade
to just drones

Cue 11:
rumble and
FFM

Elec. 5/4 4/4 3/4 5/4

65 3 3 3

Voice own side trem - bled trem - bled be-fore the sor-cer-ess serv - vant up -

Elec. 7/8 2/4 4/4 3/8

4

70 *mf*

Voice

on the in - spi - ra - tion which is the soul _____ most won - der - ful

Elec.

74 **F** *f*

Voice

dis - grace crea - ture un - wor -

Elec.

Cue 12:
moving to mostly samples

78

Voice

- thy will - ing with - out god con - vict dis - grace crea

Elec.

82 **G**

Voice

- ture un - wor - thy with - out God un - worth - y

Elec.

86 *7:6* *3*

Voice

the a - ccom - plish - ment of her dis - grace ev - er great - er and great - er crea - ture

Elec.

Cue 13:
more processing
fewer samples
E/E♭ drone

90 5

Voice
be-wil-der-ing e - vil breathed in - to her mind pow - er the in - tox-i-

Elec.
5/4

H

93 *ff*

Voice
ca-tion of vic-tor-y and ha-tred and en-vy Jeanne called the maid li - ar

Elec.
5/4

Cue 14:
intensify
add A drone

mouth covered mouth uncovered mouth covered mouth uncovered

97 *p sub.* *ff sub.* *p sub.* *ff sub.*

Voice
a- bus - er of peo-ple my Jeanne called the maid my voi ces li - ar

Elec.
5/4

Cue 15:
toggle off

Cue 16:
toggle on

Cue 17:
toggle off

Cue 18:
toggle on

Cue 19:
toggle off

I *p sub.* briefly more confident *mp* *pp* *ff sub.*

104 9

Voice
my voi ces my voi - ces were of God of God of Jeanne called maid a-bus-er and li-ar

Elec.
5/4

Cue 20:
toggle on

6 *f*
spoken, breathy, aggressive, dramatic
exaggerate consonants

Voice

ss-soothe ss - say-er blas-phe-mer of God per - ni-cious-ss ss - su-per

Cue 21:
crazy whispers

Elec.

116 **J** *mf* *f sub.*

ss - sti-tious-ss they have not de-ceived me my voi - ces i-dol-a-trous-ss

Cue 22:
suddenly less processing

Cue 23:
crazy whispers

Elec.

cruel dis - ss - ol-ute in - vo-ker of de-vil-ss a-po-state schis-ma-tic he-re-tic

Elec.

K 127 *mp* *p*

they have not de - cei... ..eived me Je -

Cue 24:
suddenly less processing

Cue 25:
even less

Elec.

132

Voice

-sus Je - sus

mouth uncovered -----> mouth covered

Cue 26:
ending

Elec.

Displacement

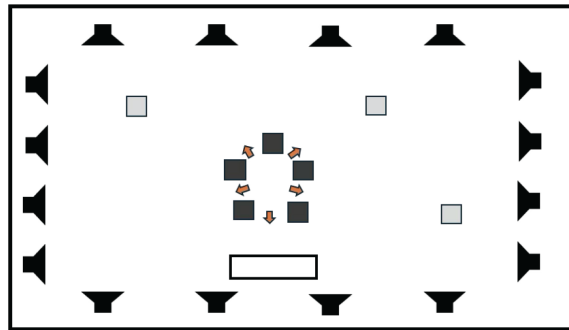
an interactive sound installation

Aaron Mencher

Explanation

Displacement is a sound installation and sculpture that explores the impact of the military on surrounding civilian communities within San Diego. The piece focuses on the sonic disruption caused by military aircraft. During the installation, the sounds of the fighter jets are played directly into metal plates using transducers. The vibrations shake the dirt and pot fragments on the plates. The moving particulates create additional noise as they crash against the plates intensifying the violence of the sounds. Sounds are also diffused through 16 speakers around the perimeter of the space. These sounds include processed versions of the field recordings as well as sine tones pitched at prominent frequencies in the field recordings. Rangefinder sensors control additional manipulations of the sound based on the audience's proximity to the metal plates. Through this action of displacement, the piece questions how the sonic environment created by the military disturbs the human and natural landscapes around San Diego.

Layout



- Speaker icons: speaker locations which diffuse multichannel fixed media sound
 - Fixed media is in 8 channels with each channel doubled.
- Large white rectangle: table with computer and audio interface
- Dark grey squares: metal sheets with transducers and found objects; sound is controlled by rangefinder sensors.
 - The sound output is algorithmically generated live through Max MSP using a large sample bank of field recordings.
- Light grey squares: metal sheets with transducers and found objects.
 - The sound output is algorithmically generated live through Max MSP using a large sample bank of field recordings without input from the rangefinder sensors.
- Orange arrows: rangefinder sensors pointing in the direction of the arrows
 - Rangefinder sensors communicate with Max MSP through an Arduino Uno.
- Found Objects: additional objects are placed throughout the space to both facilitate audience movement and fulfill aesthetic goals.
 - These objects include dirt, broken cinder blocks, broken flowerpots, and additional metal sheets.

Appendages

for reed quintet

Aaron Mencher

Appendages

dedicated to Splinter Reeds
for reed quintet
duration: 8 minutes

Technical Requirements

Clarinet: The clarinetist will be playing on a clarinet mouthpiece that has a PVC pipe inserted into the base of the mouthpiece. Half inch outer diameter tubing will most likely work. To ensure a seal with the mouthpiece, you can use a small copper pipe fitting and some electrical tape to attach the mouthpiece to the PVC pipe. The pipe should be cut to such a length (about 4 feet 11 inches) that the note produced is Bb 1 and 31 cents flat (a frequency ratio of 7:2 with Co).

Bass Clarinet: The bass clarinetist will be playing a bass clarinet mouthpiece attached to a length of PVC pipe. Depending on the set up, either 1 inch or 1.25 inch pipe will work best. If the pipe is much wider than the mouthpiece, soft Styrofoam packing material can be wrapped around the mouthpiece cork to seal off any extra space. The pipe should be cut to such a length that the note produced is Co (about 17 feet 2.5 inches). To make the instrument more easily transportable, the pipe can be cut into multiple pieces and joined with pipe fittings to create a more manageable shape and size.

Performance Directions

Air sounds



Use alternate fingerings to change the timbre of a note. Each number should correspond to a different fingering and remain consistent throughout the piece.



Play at the tip of the reed.



Play just below the heart of the reed.



Play at the string of the reed.



Strong pressure on reed. Bite reed.



Weak pressure on reed.

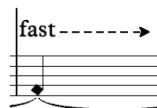


Slap tongue. All slap tongue should have as little pitch material as possible.



Bassoon only.

Rolling notes. A special classification of multiphonic. Indications of "fast" or "slow" refer to how fast the note rolls or beats. This can be controlled through embouchure manipulations.



Bassoon only.

Tongue flaps. Flap tongue against reed without blowing into instrument. Aim for a woody percussive sound.



Performance Directions Continued

Bass clarinet only.

Airy harmonics are produced by using only barely enough embouchure pressure to produce a faint sound, mostly upper harmonics, letting most air leak out through instrument. Ask composer for sound sample if necessary.

airy harmonics



Clarinet only.

Rather than articulating with the tongue, stop and unstop the air using the pad of the finger at the end of the tube to create staccato articulations. When your finger unstops the tube, there will also be a slight burst of air sound from the release of the pressure. Ask the composer for a sound sample if necessary.

articulate all staccatos using finger at the end of the tube



for Splinter Reeds
Appendages

Aaron Mencher

$\text{♩} = 60$
air
no reed

Oboe

mf pp

articulate all
staccatos using finger
at the end of the tube

PVC Clarinet

f pp

slap
no pitch

Alto Saxophone

mf pp

slap
no pitch

PVC Bass Clarinet

f pp mp pp f

air

Bassoon

flap

mp ppp

5

Ob.

air

mf pp

PVC Cl.

pp mp pp f

Alto Sax.

ppp f mf

harmonic
voicing

PVC B. Cl.

abrupt
cutoff
air harmonics

p f p f p f

Bsn.

mf f mf

2

9

Ob. *air*
mf *pp*

PVC Cl. *pp* *mp* *pp* *f* *pp* *mp* *pp*

Alto Sax. *pp* *mp* *ppp*
air with flutter
harmonic voicing

PVC B. Cl. *air*
p *f* *pp* *mp* *p* *f* *p* *f* *p* *f*

Bsn. *ppp* *p*

16

Ob. *air*
mf *pp* *air* *mf* *6* *5*

PVC Cl. *f* *pp* *mp* *pp* *f* *pp*

Alto Sax. *pp* *mp* *6* *6*

PVC B. Cl. *p* *f* *p* *f* *p* *f* *p* *f*

Bsn. *mf* *mf*

20

Ob. *p* *pp* *mf* *air* 3

PVC Cl. *mp* *pp* *f* *pp*

Alto Sax. 5 *pp* *mf* 5 3

PVC B. Cl. *p* *f* *p* *f* *p* *f*

Bsn. 6 6 6 6 6 6 6 3 *pp* *mp* *pp* *mp* *pp* *mp* *pp* *mp*

23

Ob. *pp* *mf* *pp* *air* 6 5 *insert reed* 2/4

PVC Cl. *mp* *pp* *f* *pp* 2/4

Alto Sax. *pp* *mf* 5 3 *pp* 2/4

PVC B. Cl. *p* *f* *p* *f* *p* *f* 2/4

Bsn. 3 6 6 6 3 6 6 3 6 6 3 6 *pp* *pp* *mp* *pp* *pp* *mp* *pp* *pp* 2/4

6

39

Ob.

1 2 3 1 2

mf *p* *f*

PVC Cl.

5

pp *mp* *pp*

Alto Sax.

mf *pp* *mp* *pp*

B. Cl. Tube

p *f* *p* *f* *p* *f* *p*

Bsn.

Berio tremolo

pp *f* *p* *mp* *p* *mp* *p*

slow ----> fast ----> slow ----> fast ----> slow 3 flap 6 normal 6

multiphonic voicing

42

Ob.

1 2 3 1 2 3 1 2

pp *mf*

PVC Cl.

6 5 3

f *pp* *f sub.* *p* *mp*

Alto Sax.

mf *pp*

B. Cl. Tube

f *p* *f* *p* *f* *p* *f sub.*

Bsn.

Berio tremolo

pp *mf* *p*

fast

8

Ob. *49* 1 2 1 2 2 1 2 1 2 1 2 1 2 *p* 1 2 1 2 2 1 2 1 2 2 1 2 1 2 1 2 1 *f* 6 5

PVC Cl. 3 3 5 3 *f* *p*

Alto Sax. *f* *pp*

B. Cl. Tube *p* *f* *p*

Bsn. *pp* *ff* *mp* fast slow fast

Ob. *51* 2 1 2 3 *p* 1 2 1 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 *f* 6 5 3 *p*

PVC Cl. *f* *p* *f sub.* *p sub.* *f* 6

Alto Sax. *mp* *f sub.* 6 5 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1

B. Cl. Tube multiphonic voicing *f* *p* *ff* abrupt cutoff

Bsn. *slow* Berio tremolo *f*

Ob.

PVC Cl.

Alto Sax.

B. Cl. Tube

Bsn.

67 2 3 1 2

32 32 7 32

68

ff sub.

pp sub.

f p

ff sub.

mp

ff sub.

f

p

mf

p

f

pp

mf

pp

harmonic voicing

airy harmonics

Berio tremolo flap

78

14

88

Ob.

$\text{♩} = 78$
flutter

ff

fp

PVC Cl.

5

32

6

5

3

Alto Sax.

2

1

2

3

mf

B. Cl. Tube

2

4

32

p sub.

Bsn.

ff

timbre trill
fast

91

Ob.

1 2 1 2 1 2 1 2 1 2 1 2 1

f

pp

ff

mp sub.

f

mp sub.

PVC Cl.

5

pp

ff

6

5

3

Alto Sax.

f

mf

f

mf

B. Cl. Tube

f

p sub.

mf

f

Bsn.

slow

fast

6

5

mf

f

mf

f

94 15

Ob. *f* *p*

PVC Cl. *f* *pp* *f*

Alto Sax. *f* *mf* *f*

B. Cl. Tube *p* *f* *p sub.*

Bsn. *mf* *f* *mf* *ff*

slow fast slow Berio tremolo flutter

97

Ob. *f* *pp* *ff* *mp sub.* *f* *mp sub.*

PVC Cl. *f* *pp* *ff*

Alto Sax. *mf* *f* *mf*

B. Cl. Tube *ff* *p sub.* *mf* *f*

Bsn. *p sub.* *f* *mf* *f*

slow fast slow fast

16

rit.

Ob. *f* *p*

PVC Cl. *pp*

Alto Sax. *f* *p*

B. Cl. Tube *p* *pp* *f sub.*

Bsn. *mf* *f*

slow → fast

6 5 3

5

100

103

Ob. *f* *p* *mf* *pp*

PVC Cl. *f* *pp* *mf* *no dim.* *pp sub.*

Alto Sax. *mf* *p*

B. Cl. Tube *p* *mf*

Bsn. *pp* *mp* *pp f sub.* *p sub.* *f*

multiphonic voicing

low beating multiphonic

3 5 3 5 3 5

6 5 3

108 $\text{♩} = 60$ freeze 17

Ob.

PVC Cl. f pp mp pp f $pp < ff$ abrupt cutoff

Alto Sax. f p mp ppp

B. Cl. Tube $f_{sub.}$ p f p f $pp < ff$ abrupt cutoff

Bsn. mf pp mp ppp

BIBLIOGRAPHY

- Attali, Jacques. *Noise: The Political Economy of Music*. Translated by Brian Massumi. University of Minnesota Press, 1985.
- Baudrillard, Jean. *Simulacra and Simulation*. Translated by Sheila Faria Glaser. The University of Michigan Press, 1994.
- Cage, John. "The Future of Music: Credo," in *Audio Culture* edited by Daniel Warner and Christoph Cox. Bloomsbury Publishing Inc, 2022.
- The City of San Diego. "Military Installations." Accessed June 22, 2026. <https://www.sandiego.gov/veterans/military-installations>.
- Daughtry, J. Martin. *Listening to War: Sound, Music, Trauma, and Survival in Wartime Iraq*. Oxford Academic, 2015.
- Frow, John. *Genre*. Second edition. Routledge, 2014. <https://doi.org/10.4324/9781315777351>.
- Goodman, Steve. *Sonic Warfare: Sound, Affect, and the Ecology of Fear*. The MIT Press, 2020.
- Hegarty, Paul. *Noise Music: A History*. 1st ed. Bloomsbury Academic, 2007. <https://doi.org/10.5040/9781501382826>.
- Hegarty, Paul. "Noise Not Music." In *Noise as a Constructive Element in Music*, edited by Mark Delaere. Routledge, 2022.
- Jabri, Vivienne. "War, the Aesthetic, and the Political," in *War and Aesthetics: Art, Technology, and the Futures of Warfare*, edited by Jens Bjering, Anders Engberg-Pedersen, Solveig Gade, and Christine Strandmose Toft. The MIT Press, 2024.
- Leung, Muriel. "Erasure in Three Acts: An Essay," *Featured Blogger*. Poetry Foundation. October 31, 2021. <https://www.poetryfoundation.org/featured-blogger/85446/erasure>.
- Murphy, Gillian, and Emma Flynn. "Deepfake False Memories." *Memory* 30, no. 4 (2022): 480–92. <https://doi.org/10.1080/09658211.2021.1919715>.
- Oliphant, Margaret. *Jeanne D'Arc: Her Life and Death*. G.P. Putnam's Sons The Knickerbocker Press, 1896.
- San Diego Military Advisory Council. "Military in San Diego." Accessed June 22, 2026. <https://sdmac.org/military-in-san-diego/>.

Schaefer, Heike. "Un/published: Presence and Absence in Contemporary Erasure Poetry," *American Literary History* 36, no. 2 (2024).

Schoenberg, Arnold. *Style and Idea*. Philosophical Library Inc, 1950.

Sharif, Solmaz. "The Near Transitive Properties of the Political and Poetical: Erasure," *Evening Will Come* 28, April (2013).

Stover, Dawn. "Garlin Gilchrist: Fighting fake news and the information apocalypse," *Bulletin of the Atomic Scientists* 74, no. 4 (2018).

Sutton, Lea. "Sounds of F/A-18s Disturb Some Residents." *NBC 7 San Diego*, September 4, 2013. <https://www.nbcsandiego.com/news/local/fa18s-sounds-brown-field-otay-mesa-residents/2077343/>.

Utz, Christian. "Is There Noise in Helmut Lachenmann's Music?: Temporal Form and Moments of Presence in the String Quartet Gran Torso." In *Noise as a Constructive Element in Music*, 1st ed. Routledge, 2022. <https://doi.org/10.4324/9781003307020-11>