

Prompt Page

A fundamental aspect of the application is the use of prompt-like "impulse statements" as a guiding framework. These brief sentences serve as starting points for creative engagement with various aspects of musical improvisation. The aim is to distill the insights gained from the literature review underlying this project into thought-provoking prompts. A key inspiration for this approach is *Oblique Strategies*, a set of creative prompts developed by composer, artist, and producer Brian Eno in collaboration with painter Peter Schmidt (Eno and Schmidt 2015). The following section situates each prompt within its relevant academic context.

Choose a musical style. Improvise. Change the style. Improvise again. What shifts? Now omit the style completely. What changes now?

Derek Bailey distinguishes between idiomatic and non-idiomatic improvisation. This prompt encourages performers to explore the defining elements of a given genre — such as tempo, melody, and rhythm — while also reflecting on how improvisation changes when freed from stylistic constraints, as practiced by Bailey himself (Derek Bailey 1980).

Establish a motif. Alter the tempo. What remains? What transforms?

This prompt references the medieval improvisational practice of allowing performers to determine the tempo of a piece (Bechtel 1980). Additionally, it challenges the boundary between composition and improvisation by requiring the performer to repeat an improvised motif while modifying only one parameter, prompting deeper reflection on structural and expressive change.

Find a second player. Improvise until you discover a motif you like. Now establish an accompanying melody. How do you approach it?

This prompt draws inspiration from early polyphonic practices, particularly the ways in which harmonic material was generated (Moelants 2014). It also encourages performers to explore different strategies for creating harmonies. Do they prioritize melodic contour, rely on underlying harmonic progressions, or follow an intuitive, ear-driven approach? By examining these different methods, performers gain insight into their own harmonic decision-making processes.

Find a second player. Study counterpoint. Improvise until you establish a motif. Now create an accompanying line that reflects your understanding of counterpoint.

The development of counterpoint marked a significant transformation in Baroque composition and improvisation, introducing greater independence between voices compared to the earlier, more rigidly structured polyphony. Unlike earlier harmonic practices, in which secondary voices were strictly dependent on a leading melody, counterpoint allows each voice to maintain its own distinct motion (Mulligan 2024). This prompt challenges performers to experiment with their interpretation of independence and interplay when constructing an accompanying line in real time.

Study the different parts of the sonata form. Now improvise and try to structure your improvisation accordingly.

In the late 18th and early 19th centuries, improvisation was often structured within established musical forms, such as the sonata. This prompt guides players toward shaping their improvisations in a similar way, experiencing the formal and developmental aspects of classical improvisation (Eggers and Lehner 2021).

Find several players. Establish a rhythmic foundation. Now one of the players starts developing a motif while the others improvise accompanying material. Is there chaos? How do you deal with it?

For much of Western music history, improvisation in polyphonic settings was typically limited to a single voice. The rise of jazz marked a significant shift, allowing multiple improvising voices to coexist (Benson 2006). This prompt lets players explore the concept of heterophony, challenging them to navigate the balance between structure and freedom in collective improvisation.

Sit still. Take a deep breath. Now freely improvise for one minute. Where did you start? How did you end?

The free improvisation movement that emerged in the 1950s and 1960s embraced a radically open approach by rejecting conventional frameworks such as jazz standards, rhythmic structures, and melody. Inspired in part by John Cage's engagement with Zen Buddhism, musicians sought to challenge established notions of music-making (Sansom 2001). This prompt encourages players to engage with free improvisation and reflect on the challenges that arise when creating without predetermined structures.

Make the instrument sound like it has never sounded before. How did you achieve it? Can you do it again?

A defining characteristic of improvisation in the noise music genre is the unconventional use of instruments. This can involve exploring new playing techniques or manipulating an instrument's settings in unintended ways (Igarashi 1997). This prompt invites players to expand their sonic palette, encouraging them to reconsider both the limitations and possibilities of their instrument in order to generate novel material for improvisation.

Find a group of players. Now improvise freely together for five minutes. What dynamics can you observe? Who is leading? Is there equality?

Beyond the musical elements of improvisatory practices, the groups involved in free improvisation also examined the social dynamics at play during group performances. Reflecting the concepts inherent in David Toop's (Toop, David 2008) work on this subject, this prompt encourages participants to develop an awareness of the underlying power dynamics within musical group improvisations.

Improvise with another player. Be aware of what they play. At one point, imitate their playing. How did they react?

Active listening is a fundamental skill for effective musical improvisation, as highlighted by Cobussen in his analysis of *The Baltic Suite* (Cobussen 2017). This prompt encourages players to engage in a mindful and attentive state of listening while performing, helping them refine their decision-making processes during improvisation.

Improvise with a group of players. Listen closely. Do you speak the same language?

Cobussen also identifies the ability to adapt to a group's musical language as a key skill in improvisation. This refers to a shared understanding of melodic, rhythmic, and stylistic elements among the performers (Cobussen 2017). The prompt above encourages players to listen attentively while also reflecting on their own musical choices within the improvisational context.

Improvise freely for a minute. Reflect on what you have just played. Does it relate to the zeitgeist? And if so, how?

Daikoku's study highlights how musical improvisation is deeply influenced by the evolving genres and stylistic tendencies of different eras throughout the 20th and 21st centuries (Daikoku 2024). This prompt encourages players to reflect on their own improvisational choices and consider how their musical expression is shaped by contemporary practices.

Improvise in different settings. Reflect on the conditions. When was it effortless? When

was it challenging? Can you identify why?

The concept of *flow state* is particularly relevant to musical improvisation. It describes the experience of simultaneous maximum control and minimal effort when navigating complex decision-making processes, such as those inherent to improvisation (Landau and Limb 2017). This prompt encourages players to reflect on the conditions that facilitate or hinder this mental state, helping them identify factors that contribute to an optimal improvisational experience.

Make a recording of your improvisation. Listen to it. What did you enjoy more — the process or the product?

The dichotomy between composition and improvisation is central to defining the field and carries aesthetic implications. In his observations, Hamilton differentiates between an aesthetic of perfection (associated with composition) and imperfection (linked to improvisation), while also highlighting other binary oppositions, such as product versus process (Hamilton 2000). This prompt encourages players to reflect on this distinction and examine their own relationship to improvisation in relation to these concepts.

Improvise for a minute. Avoid tonal sounds. Is there still music?

In the early 20th century, the Futurists found conventional music notation and established playing techniques restrictive. Fueled by their fascination with technological innovation, they designed machines to integrate noise into their sound practices (Levi 2000). The prompt above encourages players to explore the sonic limits of their instruments and reflect on their own perception of what constitutes music.

Go to the instrument. Play a note with a basic sound. Now improvise for a minute by altering only the sonic quality — never the pitch. How do you generate variation?

Referencing Hermann von Helmholtz's *Sensations of Tone* — in which the scientist describes timbre as the interplay between a fundamental tone and its related overtones — John Cage defines the core aspects of sound as timbre, frequency, amplitude, and duration. He later expands this idea by incorporating onset and decay (Holmes 2002). The statement above encourages a deeper engagement with the tonal quality of sound during improvisation, shifting focus away from pitch and toward the nuances of sonic expression.

Find other players. Each goes to the instrument. Improvise for five minutes. Explore all the sonic possibilities of the instrument. Was there enough space for all ideas?

A central question in improvisation with electronic instruments — especially computers — is

how much complexity a single instance can contribute within an ensemble setting (Trueman 2007). This prompt encourages players to explore the sonic boundaries of the instrument, reflecting on the balance between individual expression and collective cohesion. How much complexity can one generate before overwhelming the group dynamic? Where does sonic density enhance the improvisation, and where does it hinder it?

Go to the instrument. Make the delay effect audible. Now improvise for a minute and let the echoes guide you. Where did they lead you?

Time-based effects like delay offer a vast spectrum of sonic possibilities, from simple echoes to dramatic transformations of the source material through abrupt changes in delay time (Andrea Pejrolo and Scott B. Metcalfe 2017). This prompt encourages players to use the effect not merely as an embellishment but as an active agent in shaping their improvisation. By engaging deeply with the effect's response, users can explore how sound itself — not traditional musical structures — can serve as the foundation for improvisation, reinforcing a core perspective inherent to electronic music.

Improvise on different instruments. How does the interface influence your practice? What hinders? What enhances it?

A defining aspect of improvisation with electronic instruments is the variety of control interfaces available. From ribbon controllers to touch plates, electronic instruments offer unconventional modes of interaction that significantly shape musical expression (Pinch and Trocco 1998). This prompt invites users to reflect on how the physical design of an instrument influences their improvisational approach, highlighting both the limitations and possibilities that different interfaces introduce.

Go to the instrument. Improvise for a minute. Was it easy? How would you practice?

Conducting a series of interviews with electronic musicians from Vienna, Ewa Mazierska (2018) observed that the lack of standardized playing conventions in electronic instruments fosters a more open-ended approach to performance. This prompt aims at giving users the opportunity to explore the instrument freely, reflect on their initial experience, and consider how they might develop their own methods for practice and mastery.

Find one or more partners. Improvise freely for five minutes. Observe your bodies. How did they move? Did they interact? How?

Bodily gestures in electronic music improvisation — and live electronic performance in general — present a unique challenge. Unlike traditional acoustic ensembles, where physical

movement is often seen as an expressive or communicative element, gestures in electronic music are frequently reduced to parameter adjustments, such as altering timbre or pitch (Bahn, Hahn, and Trueman 2001). This statement encourages users to consider their physical engagement with their instrument and to explore how movement might influence both their interaction with fellow musicians and their overall musical expression.

Go to the instrument. Explore how many sonic sensations you can produce with a single gesture. How does this compare to an acoustic instrument?

Electronic instruments—particularly computer-based systems—offer a unique mode of interaction. With the right setup, a single input gesture can trigger multiple sonic events, influencing parameters such as pitch, timbre, volume, and audio effects simultaneously (Dean 2011). The instrument used in this web application follows this principle, allowing for multidimensional control through a single movement. This prompt encourages users to explore these possibilities and reflect on how gestural control in electronic instruments differs from that of traditional acoustic instruments.

Find a partner. Go to the instrument. Divide the space — one person controls the upper half, the other the lower. Improvise for a minute. What happened?

For much of electronic music history, instruments were designed for solo performers. However, recent developments in instrument design have increasingly embraced multi-user interaction, allowing multiple performers to engage with a single system (Lähdeoja and Oca 2021). This prompt wants users to explore how improvisation changes when two players share control, highlighting the dynamics of collaboration and the evolving nature of electronic music performance.

Go to the instrument. Adjust only the FM parameter. Discover as many useful sounds as possible. Now improvise using your new repertoire.

Frequency Modulation (FM) synthesis involves one oscillator modulating the frequency of another, enabling a wide range of sonic possibilities — from subtle vibrato to metallic bell-like tones (Manning 2011). This statement invites users to explore the sonic potential of FM synthesis, refining their ability to shape sound and building a personalized repertoire for improvisation.

Listen to two improvisations — one acoustic and one electronic. Now go to the instrument and attempt to imitate both. What did you observe?

A central focus of this work is to examine how improvisational practices in electronic music

differ from those in acoustic settings. As discussed in the second part of the chapter on improvisation in electronic music, these differences span various aspects, including timbral contrasts and the number of discernible tonal sounds. This prompt encourages users to explore these distinctions firsthand by attempting to recreate both types of improvisation on the instrument provided by the application.

The Instrument Page

To further expand the application's potential, users are provided with a digital instrument that enables them to immediately explore and execute ideas inspired by the impulse statements on the prompt page.

This digital instrument replicates the core functionality of the theremin, originally invented by Léon Theremin in 1928, due to its significant role in shaping the sonic landscape of electronic music for nearly a century (Andrea Pejrolo and Scott B. Metcalfe 2017).

While existing digital instruments on the market more closely emulate the original theremin by utilizing mobile device sensors, the instrument in this application has been specifically adapted for a touchscreen interface. This design choice enables the seamless integration of two additional sonic features, enhancing the instrument's capacity to generate a broader range of sonic events.

These added features include frequency modulation (FM) synthesis and a digital delay effect, both of which contribute to expanding the instrument's expressive potential.

Originally described by John Chowning, FM “allows the production of complex spectra with very great simplicity (Chowning 1977)”. As the name suggests, FM synthesis operates by modulating the frequency of a carrier wave with a modulating wave.

The digital delay and its ability to adjust the delay time — analogous to altering the distance of the reflecting surface in the real-world example — enables not only the standard repetition of the signal but also a range of more complex audio effects. These include pitch and timbre-altering effects such as phasers, flangers, and chorus, which modify the signal in more dramatic ways (Zölzer et al. 2002).

On the instrument page, users interact with four touchscreen fields, each corresponding to a key parameter of the digital instrument. The field labeled "freq" controls the instrument's pitch, which is quantized to a pentatonic scale in just intonation to facilitate the production of more conventional tonal material while still retaining an unconventional character. Adjacent to this field is a slider that regulates the instrument's volume. Above these controls, users encounter an X/Y-style interface for frequency modulation. The x-axis

determines the modulation intensity, while the y-axis adjusts the frequency of the modulating oscillator. A similar X/Y interface governs the digital delay effect, where the x-axis controls the delay amount and feedback (the number of repetitions of the delayed signal), and the y-axis modifies the delay time. Abrupt changes of the delay time result in digital artefacts that users might consider useful for their improvisatory practice.

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