Relevant Sites

personal website
https://unboundedpress.org

soundcloud
https://soundcloud.com/mwinter80

vimeo
https://vimeo.com/mwinter

code repositories
https://unboundedpress.org/code

online version of this document
https://unboundedpress.org/pubs/
selected_work_samples.pdf

Selected Publications

Tom Johnson and a Rational Theory of Harmony
https://unboundedpress.org/pubs/Tom_Johnson_and_a_rational_theory_of_harmony.pdf

Meta+phenomenology: primer towards a phenomenology formally based on algorithmic information theory and metabiology
https://unboundedpress.org/pubs/metaphenomenology_primer.pdf

A few more thoughts about Leibniz: the prediction of harmonic distance in harmonic space
https://unboundedpress.org/pubs/A_few_more_thoughts_about_Leibniz.pdf

A few more words about James Tenney: dissonant counterpoint and statistical feedback
https://unboundedpress.org/pubs/Dissonant_counterpoint_and_statistical_feedback.pdf

Chordal and timbral morphologies using Hamiltonian cycles
https://unboundedpress.org/pubs/Chordal_and_timbral_morphologies_using_Hamiltonian_cycles.pdf

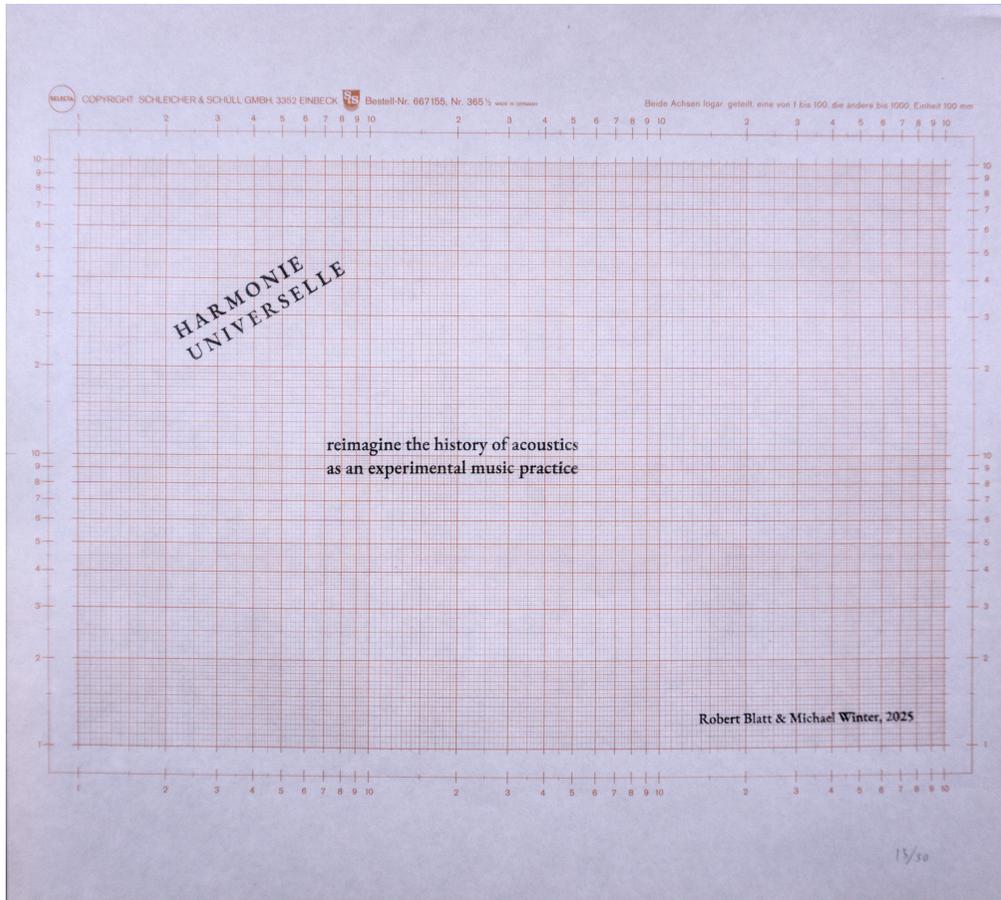*On minimal change musical morphologies*
https://unboundedpress.org/pubs/On_minimal_change_musical_morphologies.pdf

Dissertation — Structural Metrics: an Epistemology
https://unboundedpress.org/pubs/Structural_Metrics.pdf

Harmonie Universelle is a performance-installation created with Robert Blatt that reimagines the history of acoustics as an experimental music practice by considering the experiments, technologies, and observations of early acousticians as modes of composition, instrumentation, and listening. Experiments investigating sonic characteristics such as speed of sound, interference patterns, and resonance become musical material. Scientific instruments such as sirens and tuning forks become musical instruments. And texts and images from Hermann Helmholtz, John Tyndall, Sophie Germain, Ernst Chladni, Jules Lissajous, Marin Mersenne, and Leonhard Euler, among others, are read and projected as artistic observations and reflections that occupy a liminal, transitory space between the qualitative and the quantitative. Within a performance-installation environment, these elements come together in an experimental tracing of the history of acoustics as music.

seeds and ledgers 1−3 and *compact sets 1−3* (2023–2024)
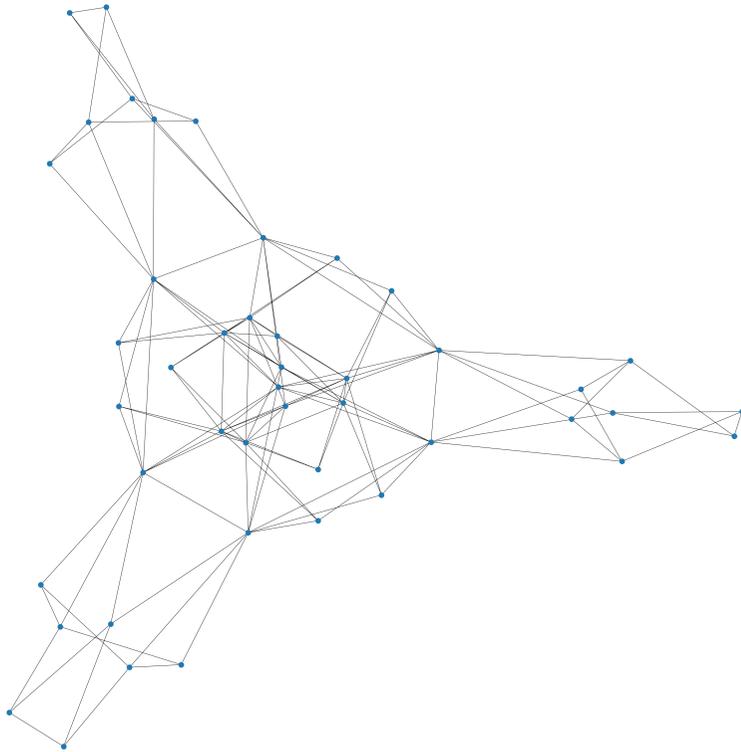
These pieces are generated using algorithms that explore a reexamination of the traditional concept of 'voice leading': how individual melodic lines create and maintain harmonies in aggregate while sometimes modulating, recontextualized in the phenomenological framework called *just-intonation* in *harmonic space*. The algorithms used to generate these pieces are detailed in a publication entitled "Tom Johnson and a Rational Theory of Harmony". Together, these pieces and the publication demonstrate the interplay between practice and research in my work.
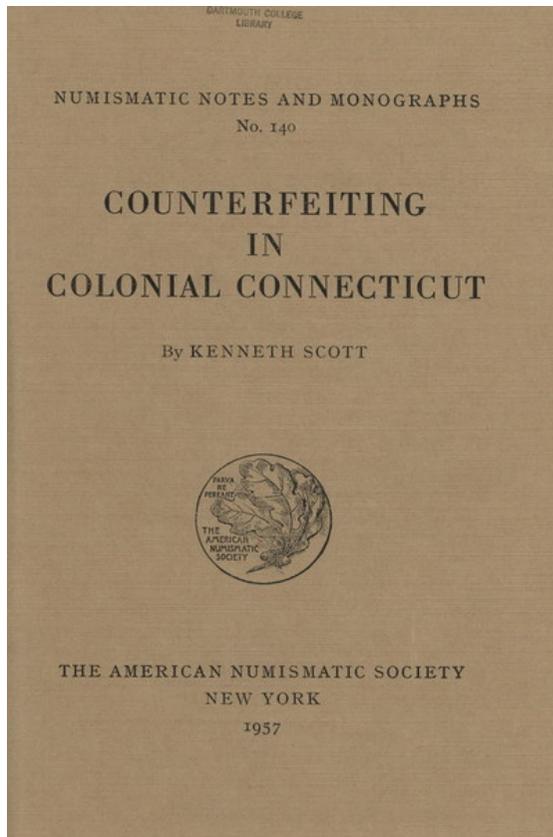
I started writing this piece with the intention to set readings of excerpts from the book *Counterfeiting in Colonial Connecticut* written by Kenneth Scott and published by the American Numismatic Society in 1957. I was intrigued by the stories and the dry, austere nature of Scott's accounts.

My original intentions were transformed by two major crises that occurred during the development of this piece: the Covid-19 pandemic and protests sparked by the death of George Floyd, a black man brutally murdered by police. I decided to add the possibility of complementing readings from the Scott compendium with readings of texts reflecting my experience during the time in which the piece was written.

Floyd was being arrested for *allegedly* using a counterfeit $20 bill. His murder, as well as the pandemic, clearly demonstrated that inequalities accepted in colonial times have persisted. As such, the use of texts about counterfeiting in colonial America acquired a whole new meaning and gravity. However, these coincidences and connections are actually quite apt. The systems enforced and perpetuated by governments today in 2020 — capitalism, democracy, communism — are counterfeit.
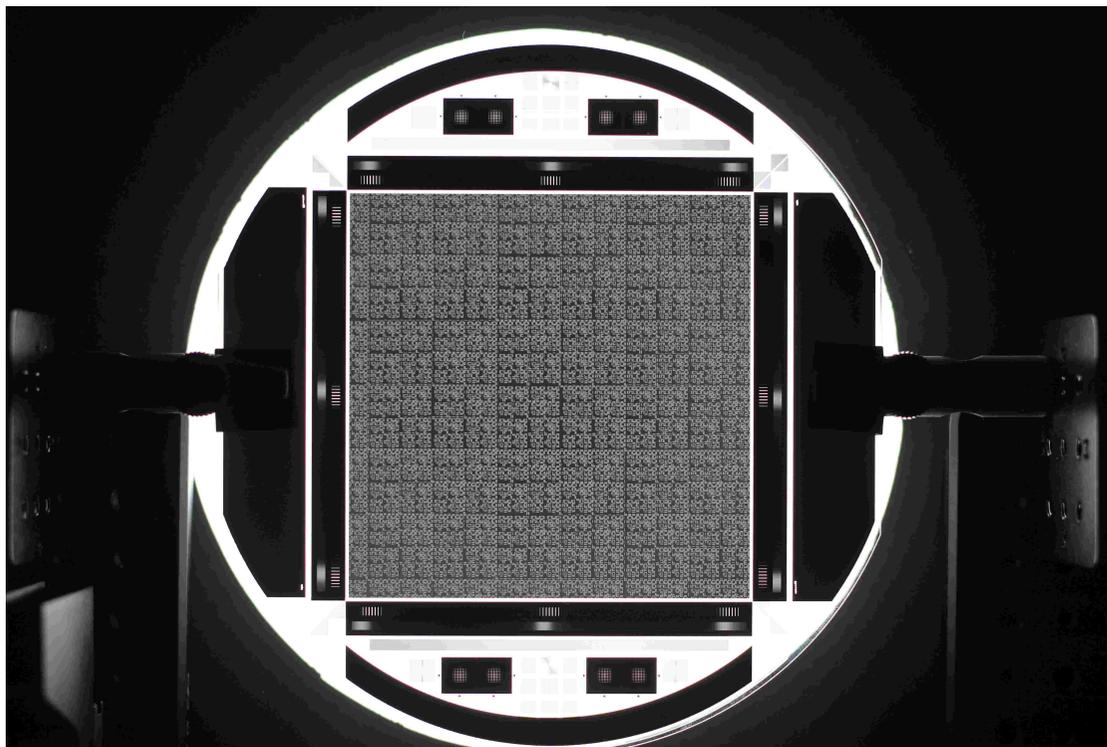
a history of the domino problem is a performance-installation that traces the history of an epistemological problem about how things that one could never imagine fitting together, actually come together and unify in unexpected ways. The work comprises a set of musical compositions and a kinetic sculpture that sonify and visualize rare mosaics constructed from dominoes. The dominoes in these mosaics are similar yet slightly different than those used in the popular game of the same name. As opposed to rectangles, they are squares with various color combinations along the edges (which can alternatively be represented by numbers or patterns). Like in the game, the rule is that edges of adjacent dominoes in a mosaic must match.

The mosaics sonified and visualized in *a history of the domino problem* are rare because there is no systematic way to find them. This is due to the fact that they are *aperiodic*. One can think of an aperiodic mosaic like an infinite puzzle with a peculiar characteristic. Given unlimited copies of dominoes with a finite set of color/pattern combinations for the edges, there is a solution that will result in a mosaic that expands infinitely. However, in that solution, any periodic/repeating structure in the mosaic will eventually be interrupted. This phenomenon is one of the most intriguing aspects of the work.

a lot of tiles (trivial scan) (2018)
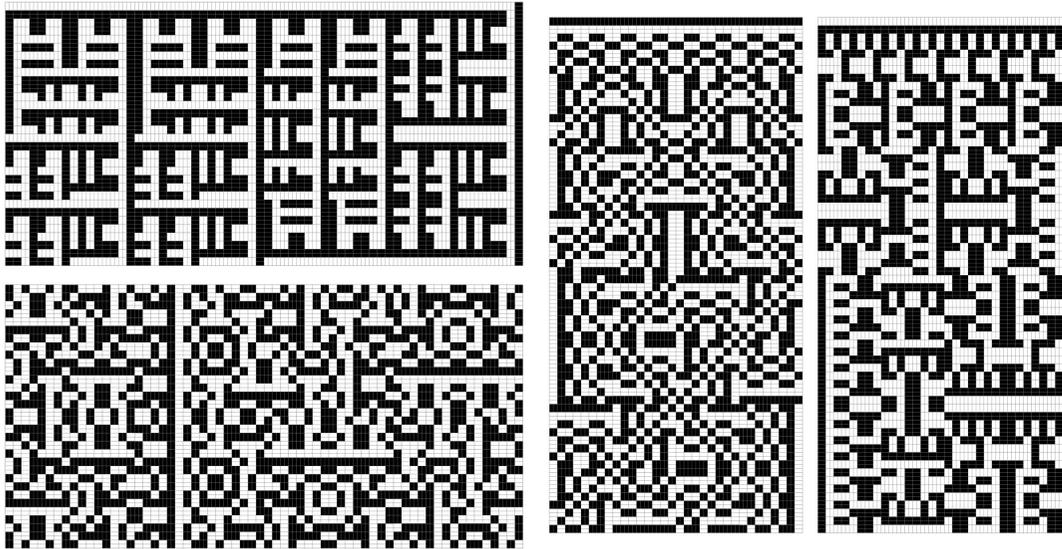
a lot of tiles (trivial scan) is based on a set of rectangle substitution tilings explored by Chaim Goodman-Strauss in his seminal paper *Lots of aperiodic sets of tiles*. A rectangle substitution tiling is generated by dissecting a rectangle into 4 smaller rectangles, which are then dissected into 8 even smaller rectangles, and so on. Rectangles can produce both periodic and non-periodic tilings and thus are not strictly aperiodic. A strictly aperiodic set of tiles consists of a group of geometric shapes that admit only non-periodic tilings. However, Goodman-Strauss shows in his paper that the group of rectangle substitution tilings used for this piece can be represented by 25380 aperiodic tilings using subsets of 211 non-rectangular tiles. Prior to this discovery, only a handful of strictly aperiodic tilings were known.

The parenthetical in the title 'trivial scan' refers to the method of sonification. A given tiling is further dissected into squares (groups of two rectangles side-by-side) which are then scanned/read such that the orientation of the pairs of subtiles that form the squares (whether they are grouped vertically or horizontally) determines sonic parameters.

rockfall (2017)

rockfall is a kinetic sculpture that automates rocks falling against rocks created in consideration of the social and environmental impact of mining on the local and indigenous communities of Bolivia and Peru. The machine consists of a conveyor belt that raises rocks from ground level to be dropped onto a rock formation that funnels the rocks back onto another conveyor belt. An artist statement/extensive description of the genesis of the work can be read in the score included on the webpage linked below.

Acclaimed musician and musicologist Clive Wearing suffers from one of the worst known cases of amnesia after contracting herpes encephalitis. Wearing's caretakers encouraged him to keep a journal. *Remembering Clive Wearing* is an installation-opera that sets entries from Clive Wearing's journal. At intervals prescribed by the journal itself, entries are read and accompanied by a sonic and visual flickering/flourish of activity using recordings of Orlando de Lassus' nine *Lamentationes Hieremiae Prophetae* (as Wearing was an expert in the music of Lassus), sustained noises and tones, as well as lights. The piece intends to reverently reflect the importance of memory on our lives and personal identity.

Work page: https://unboundedpress.org/works/remembering_clive_wearing

In 2016, I was asked to write a piece for the 300th anniversary of Gottfried Wilhelm Leibniz's death and have been investigating musical threads running through his vast body of writing. Even within his early works, it was clear that Leibniz had very deep musical insights. For example, his dissertation entitled "On the Art of Combinations" discusses applications of combinatorics to possible musical registries of an organ and in a later letter to Christian Goldbach, Leibniz suggests an extended harmony based on higher primes.

Leibniz worked in a world with far less specialization than is common today. He was a polymath of epic proportions who drew little distinction between various intellectual domains; including music. Many of Leibniz's texts are in the form of letters. *preliminary thoughts* is a "musical letter" to my friend, mathematician Gregory Chaitin, addressing preliminary thoughts/reactions to the writings of Leibniz about combinatorics, harmony, aesthetics, structure, epistemological vs. practical limits, free will, and even love with respect to creativity.

Work page: `https://unboundedpress.org/works/preliminary_thoughts`

tergiversate (2015)

tergiversate enumerates all ways 3 instruments can start (or enter) and stop (or exit) together over 6 beats. However, since the exit of one cell always overlaps the entrance of the next (as defined by a mathematical structure called a de Bruijn sequence), the tones are not actually stopped but rather rearticulated by a change in bow/bellow direction. The score simply indicates when the direction changes occur for the respective players. Thus, a 3 note chord sounds throughout with a continual, yet subtle rhythmic shifting as the different patterns are enumerated.

In this installation, a genetic algorithm tries to put two signals out of phase and quiet a particular space/room. The minor variations heard are the mutations from generation to generation. When the room does not get quieter for an extended period of time, a new 'life-cycle' begins. The installation aims to create an environment for intimate viewing and focused listening within a given space.

michael winter

approximating omega

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michael winter approximating omega

EDITION WANDELWEISER RECORDS

EWR 1718

michael winter
approximating omega

1.	approximating omega	33'21"

muirgen éléonore gourgues (reading)
judith hamann (violoncello)

2.	for gregory chaitin	15'18"

michael winter (piano)

EWR 1718
ISRC: DE-G72-17018 01-02
LC 02174
Made in Germany

sound engineer:	scott cazan
mixed and edited by:	aidan reynolds
executive producer:	antoine beuger
layout:	daniel bechem, mess media, berlin
printed by:	das druckhaus, korschenbroich

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Approximating Omega is an example of how epistemology influences my practice and how I reconcile differences between epistemological and practical limits. This piece sets a text by mathematician Gregory Chaitin and sonifies a computer program he defined that approximates the maximally uncomputable number, Omega.

just above and/or below the waterline... (2010)

The title is the score. While I interpret this as a call to action for a performance piece, a realization could take many forms. This image is from a realization of the piece on the banks of the Los Angeles River where rocks were used to write the text of the score near the waterline.