

Operationalized Resignation

Holding Reality in Abeyance within Finite Measurement Spaces

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PREFACE

The essay that follows draws a single conceptual thread through several years of work. It names that thread *operationalized resignation*. The name did not exist while the work was being made.

Each project in this account began from a question native to its own circumstance. How fundamental is timing to a digital system, and what happens when a non-quantizable signal is inserted into it? What does it mean for a machine to count, physically, every state it passes through? Does institutional writing perform the operations it formally resembles? These questions did not anticipate each other. They were not stages in a programme. Looking back, they were inclined in the same direction, and the essay is the record of looking back that inclination.

The argument here is retrospective. That is not a qualification or an apology. A retroactive account of method is a different kind of claim than a prospective research design, and it is honest about something the prospective kind tends to conceal: that the frame comes after the work, not before it.

I. Membrane — The First Surface

The first surface I ever questioned was the skin of a dead animal, stretched and laced over the mouth of a drum.

I joined the samulnori club in my first year of middle school because everyone around me was talking about the illustration club or the football team, and I wanted something that was not that. For three years I practiced the janggu in hallways and borrowed classrooms, sometimes straight through regular lessons when a competition was near. And for most of those three years I believed, in the way one believes things that have never once been said aloud, that the sound was mine. That it came out of my wrists, out of my fingers, out of the speed I had drilled into them.

In my last year there I understood that I had the direction of causality backwards. The janggu is closed at both ends by hide, cowhide on one side, horsehide on the other, and the thickness of those hides is not a detail. It is a decision, fixed in the body of an animal that is no longer alive, about which sounds are possible at all. My muscles had not been producing the sound. They had been produced by it: years of small corrections, none of them chosen, all of them dictated by a membrane whose properties I had never once thought to ask about. The surface was not transmitting my intention. My intention had been trained by the surface.

I had no words for this at fifteen. I had a drum, and a vague unease that the instrument had been playing me. I start here because everything I have done since has been some version of standing in front of that membrane and asking what, exactly, it answers to.

I did not leave the membrane afterwards; I changed instruments. From around the end of middle school I played drums, and I kept playing them for more than ten years, mostly inside the small economy of independent music, where nobody can afford to hire anybody. Whatever a recording needed and could not be paid for, I learned to do myself: miking, mixing, mastering, the repair of whatever broke. There was no decision I can date on which this stopped being improvisation and became a trade, but at some point I was on the other side of the membrane. Not the player now but the technician, the one other musicians paid to set up the room before the player arrives. A microphone is also a membrane. A diaphragm thinner than the horsehide, doing the same work in the same direction: air moves, the surface moves, and something on the far side inherits the motion. Except that on this far side the inheritance does not stop. The motion becomes voltage, the voltage crawls down a cable, gains in a preamplifier, crosses a converter, and arrives, at the end of the chain, as a number. Then another number. Forty-four thousand one hundred of them a second, sixteen or twenty-four bits deep, and from that point on nothing in the chain is motion anymore. I spent years inside that chain, soldering it, debugging it, listening to it fail in instructive ways. For about five of those years I also built the chain for other people: a one-person workshop on the side, custom cables

and patchbays made to order, parts and quality specified by the customer, every joint tested before it left the bench. The work is unglamorous and completely absorbing, and it has one property I did not appreciate until much later: it forces you to witness, in millisecond detail and as a matter of professional duty, the exact procedure by which the world is exchanged for numbers.

The question inside that room never arrives dressed as philosophy. It arrives as a fader and a deadline. How should this instrument sound? Brighter? Closer? More like itself? And it was that last phrase, which I must have said or thought a thousand times, that eventually cracked open. More like itself. Like its real sound. Hi-fi: high fidelity. Fidelity to what?

Trace it upstream and the referent begins to recede. Faithful to the sound at the diaphragm? Move the microphone a hand's width and that sound is a different sound; neither position is the true one. Faithful to the room, then. Which seat in the room. Faithful to what the player hears? The player stands behind the instrument, in acoustic shadow, hearing a sound no audience will ever hear. Faithful to the vibration itself, before any ear? But then it is not yet sound; it is displacement in air, and calling it sound already smuggles in a listener. Somewhere along this regress I understood that I was no longer doing engineering. I was doing, badly and without a license, the thing I had spent my undergraduate years reading: the old interrogation of the real, of the thing behind its appearances, conducted this time not in a seminar but at a patchbay, with the session clock running. The discipline I had walked away from had been waiting for me inside a microphone.

There is no master tape of reality. That is the entire difficulty, and it cannot be repaired by better equipment, because every improvement in the equipment only sharpens the question of what the equipment is being faithful to.

What the trade actually did about this is, I think now, quietly remarkable, though no one in any control room would call it epistemology. The trade stopped talking about the real sound. Not officially; the word fidelity survives on the spine of every magazine. But in practice, in the rooms where decisions are made, the criterion changed hands. A good mix is not the mix closest to the original, because no one can produce the original for comparison. A good mix is the one that survives translation: that holds together on the studio monitors and in the car and in the cheap earbuds and on the club PA and on a phone lying face-up on a kitchen table. Correspondence to a source was replaced by invariance across renderings. Nobody announced the substitution. The trade has no use for announcements that do not move a fader. But the substitution is total, and it works. Records get finished. The question of the real sound is not answered; it is left standing in abeyance, fully intact, permanently unpaid, while everyone in the room gets on with the audible part of the job.

I want to be precise about what I felt when I first saw this clearly, because it was not disappointment. It was something closer to relief, with a residue I could not name for years. The relief: here was a working procedure, an entire industry of careful people, that had found a way to act rigorously without first settling what is. The residue: the question had not been dissolved, only deferred, and I could feel it continuing to exist somewhere just outside the signal chain, the way you feel a speaker's cone still moving after the mute button.

The exchange was possible, I told myself, because sound permits it. Loudness has a unit. A frequency response can be plotted, a converter's error measured against a reference tone. Sound offers handles; you can bolt a gauge onto almost any joint of the chain and read a number off it, and the numbers, arranged honestly, will referee most disputes. For a long time I assumed this was simply what sound was like, and that the procedure ended where the handles ended.

But I kept encountering a kind of signal that seemed to offer no handles at all, and it was not exotic. It was sentences. Language, in certain rooms, behaves exactly like a surface: it vibrates with the grammar of analysis, it carries every formal marker of a mind at rigorous work, and it asks to be trusted the way a label on a cable asks to be trusted. I had spent years verifying cables. I began to wonder what it would take to verify a sentence.

II. Invocation — Vocabulary without Execution

It turned out I already owned most of the tools. The reading habit came years before the multimeter.

In high school, a boarding school deep in the countryside, I spent my evenings alone in the reading room with books I had no business understanding: collected papers on Korean philosophy, on the intellectual history of the twentieth century, on continental metaphysics in translation. I could not read them, so I built a procedure instead. Take the sentence apart. Word by word, particle by particle, ending by ending, down to units that divide no further; then hold the pieces and reassemble until the sentence either closes or refuses to. An hour on a single sentence, sometimes two. And when it finally closed, something happened that I have never stopped trusting: the sentences before it, the ones I had given up on, assembled themselves retroactively, a whole page clicking shut at once. For years I called this a reading method. It was a continuity test. I was checking, terminal to terminal, whether anything actually ran through the middle of the sentence.

The sentences I want to talk about arrived later, by e-mail and by courier, attached to artworks. For some years I was the in-house technician of an art space, the person who receives the crates and the international artists and makes their works run in a building

that was never designed for them. The position has one privilege that I have never seen acknowledged: the technician knows what a work does. Not what it means, what it does. This projector, this sensor at this threshold, this twelve-second loop, this relay that closes when a visitor crosses the beam. I had the wiring diagram because in most cases I had drawn it. And then, with the work running behind me, I would read the text that travelled with it.

The texts were written in a grammar I recognized immediately, because it was the grammar of the books from the reading room: the long noun phrases, the qualifying adjectives stacked like instrumentation, the vocabulary of operations. The works did not show or move or repeat; they interrogated, negotiated, subverted, destabilized, problematized. Verbs of execution. I had just spent two days inside the execution. I had crawled through every centimeter of it with a continuity tester in my hand, and I could not find where the interrogation was running, or what it ran on. The sentence passed every visual inspection. The connectors were immaculate. There was nothing soldered inside.

I want to be careful here, because the easy reading of this is an accusation, and an accusation would miss what actually unsettled me. No single author was lying. The same sentences arrived from every direction, from three continents, in the same cadence, with the same adjectives, the way an accent arrives: acquired, not invented, worn as proof of having been somewhere. What I was looking at was not a person's claim but a register, a whole climate of language in which the markers of reasoning circulate on their own, detached from the operations they are markers of. And a climate cannot be argued with one sentence at a time. My disassembly procedure, one hour per sentence, was the wrong scale of instrument. It was a soldering iron brought to a weather system.

My reflex by then was already fixed: where a claim repeats, bolt a gauge onto the joint. The question was only what the gauge should read. Not depth, not truth, nothing that grand; gauges do not read truth. Something smaller and meaner. Whether the words that signal reasoning travel in the company of reasoning: whether a therefore or a because ever appears within reach of the heavy vocabulary. Whether the learned adjectives, so carefully chosen, ever commit to the same noun twice, in the way that a term of art earns its precision by being repeated. Whether, underneath the academic grammar, the probability mass of the writing sits where analysis sits or where description sits. In time I did this properly, with parsers and statistics instead of evenings, across sixty-two thousand documents from thirteen institutions, against a baseline of peer-reviewed prose, which is to say across more sentences than one person could disassemble in several lifetimes. The gauge read what my hands had already told me years earlier. The grammar of the academy: fully adopted, indistinguishable at equal length. The connective tissue: absent in the majority of documents. The adjectives: never settling, never repeating a pairing, anywhere, in any of the thirteen, as if commitment itself were a stylistic error. The surface was complete. The continuity was not there.

I do not think this is art's private scandal, and the longer I sit with it the less interested I am in the art part. The structure is portable. A pixel count begins as a proxy for how close a display sits to the eye's world, and ends as the number printed largest on the box. A benchmark begins as a proxy for capability and ends as the target the capability is built toward. The word intelligence is at this moment completing the same migration. The pattern only needs one condition: that the marker can be detached from its operation. Once detached, the marker will circulate on its own, and it will outcirculate the operation every time, because circulation is cheap and execution is not.

There is an asymmetry in all this that I did not anticipate, and it is the part I keep returning to. To say in public that those sentences perform reasoning without executing it, I had to prove my own instruments four separate ways: four independent measurements, cross-checked against each other, checked against a second machine, checked against a human reader, every threshold declared in advance. The sentences themselves had never been asked for any of this. They had circulated for decades, doing the work of authority, exempt by default. The invocation travels duty-free; the measurement pays at every border. I am not lodging a complaint. The duty is the difference. Paying it is the only thing that separates my gauge from one more confident vocabulary.

But a gauge is calibrated against a reference, and this is where the floor I was standing on began to feel thinner than it looks. My reference was the baseline: the peer-reviewed prose, the writing where, I was prepared to swear, markers and operations still travel together. I had a name for what it carried. I called it rigour, analytical rigour, and the gauge measured distance from it in four directions. And I knew, in the way you know a fault is intermittent long before you can reproduce it on the bench, that I had never once tested the reference itself. Unbolt the gauge, turn it around, clamp it onto the baseline: what does it read? I did not know. I still do not. An instrument that cannot be pointed at its own reference is not yet an instrument; it is a loyalty. The gauge would have to examine itself.

III. Abeyance — The Gauge Examines Itself

I had known the question was coming. That is the part I want to record accurately: there was no ambush, no crisis arriving from outside. The question had been audible from the beginning, the way a ground loop is audible under a recording long before anyone agrees to deal with it. What is this rigour the gauge measures distance from? I had operationalized it, of course. Rigour, in my hands, had become four numbers: the company that connectives keep, the fidelity of adjectives to their nouns, the shape of the syntax, the seat of the probability mass. But I had chosen those four because they tracked something I already believed rigour to be, and when I asked myself what that something was, independent of the four numbers chosen to track it, I found I was holding the gauge in

one hand and pointing at the gauge with the other. Clamp it onto the baseline itself, onto the peer-reviewed prose I had been treating as ground: what does it read? I sat with that question for a long time. I could not answer it. I want that sentence to stand without decoration. I could not answer it, and I published anyway, and both of those facts belong in this record.

What I did next is what I always do with an intermittent fault: I checked whether anyone upstream had already characterized it. The instruments I had borrowed come from a discipline with a name for what I was measuring. They call the thing behind the numbers a construct, and the question of whether the numbers honour it, construct validity. I went to the source expecting a foundation and found a fault line. The paper that coined the term, Cronbach and Meehl, nineteen fifty-five, does not say that a construct is a piece of reality. It says a construct is a knot in a net: its meaning is the set of connections it keeps with other measurable things, and validation is the slow audit of whether the net holds. Half a century later, Borsboom and his colleagues answered with the opposite doctrine: a measurement is valid only if the attribute exists, and its variations cause the variations in the numbers. Existence or coherence. The field that lent me my tools has been split along exactly this line for seventy years, in print, unresolved. I had been treating my wobble as a private defect of nerve. It was the geology of the ground I had built on. The relief of that discovery was real, and I distrusted it immediately, because relief is what you feel when a fault is reclassified as a feature, and the fault is still there.

What the split taught me, eventually, was not which side is right. It was that the two sides are not answering the same kind of question, and that I had been conflating two kinds all along. Whether this corpus carries fewer connectives than that one, by how much, with what confidence: that question lives inside the frame. It is answerable, decidable, repeatable; you can be wrong about it in a way that another person can demonstrate. Whether analytical rigour exists, whether the real sound of the instrument exists, whether there is anything at all behind the net of measurements: that question does not live inside any frame, and what it calls for is not an answer but a decision, the decision of whether to adopt the frame and get to work. I learned later that this distinction was old, that a Viennese logician had drawn it cleanly back in nineteen fifty, internal questions and external ones, and that he too had concluded that the external kind are settled by choosing, not by knowing. I did not arrive at the distinction by reading him. I arrived at it by noticing what my own hands did at the workbench: they answered the internal questions and they suspended the external ones, every working day, without ever being instructed to.

Here is the confession the title of this text has already made on my behalf. At some point, and I cannot date it any better than I can date the moment playing became a trade, I struck a bargain. For as long as I work at this level of proof, I do not ask whether the real exists. Not because the question is meaningless; I have never believed it is

meaningless. Because at the resolution where evidence is demanded line by line, the question cannot be made to pay. Anyone who has worked at that resolution knows the antinomy that lives there: the real obviously exists, and therefore it does not. Both halves are felt with complete conviction, often in the same hour. I know that this is a contradiction. I am not resolving it here; I am reporting it, the way one reports a measured value that should not be possible and will not go away. And beneath the antinomy, a fact so flat it is almost embarrassing to write down: questions of being do not draw funding, and I have rent. The bracket I placed around the real was not only an epistemic act. It was an economic one. Any honest account of method that omits the rent is itself a vocabulary without execution.

The old skeptics had a word for the suspending move, and a promise attached to it. Suspend judgment, *epoché*, and tranquility follows: *ataraxia*, the becalmed mind, suspension as a kind of retirement. I checked my own case against the promise and the promise fails. My suspension bought no calm whatsoever. It bought throughput. Sixty-two thousand documents, four converging instruments, a pipeline that ran for months: none of it would have existed if I had stopped to settle what rigour is. The suspension was not a retirement; it was a hiring. And the word that actually arrived, when I finally tried to name the disposition, was not Greek but Korean: *체념*. The dictionary gives it as resignation, and resignation is close, but the English tilts toward defeat, a hand opening and dropping something. The older sense of the Korean word runs the other way. Its first character is the truth-character of the Buddhist canon, the one that stands in the Four Noble Truths, and the word's archaic meaning, still listed first in the standard dictionary, is a mind that has seen the principle of the matter clearly. Resignation, in that older grain, is not the failure of clarity but its result. What I had been practicing for years had this exact structure: a giving-up that functions, a renunciation you can run a pipeline on. Resignation, operationalized.

And once it had a name I could finally see what the procedure had been doing all along, which is the one finding of this entire text that I would defend without reservation. I have never measured an essence. Not once, in any domain I have worked in. The mix was never measured against the real sound; it was measured across renderings, car against earbuds against monitors, and the number that mattered was the spread. The corpus was never measured for rigour as such; it was measured for distance from a baseline, and the finding, every finding, was a gap: an odds ratio, an effect size, a difference of differences. A gap is a number you can take without ever deciding what either of its endpoints is. Difference is measurable under full ontological suspension. This is not a limitation of my instruments. It is the reason they work. The resignation is not the scaffolding around the method; it is the load-bearing wall.

There is one more place the vocabulary doubles, and I want to touch it exactly once. The phrase I have been using for the rooms I work in, finite measurement spaces, is a near-

homonym of a term of art in mathematics: a finite measure space, a space whose total mass is bounded and known. Every digital system I have ever built or repaired is one, literally. Two to the thirty-second power: the counter's whole world, a little over four billion states, no more, the total announced before the first count. Sixteen bits of amplitude. Five hundred and twelve positions of context. Inside a space whose mass is finite, every internal question has an answer in principle; that is what the finitude purchases. The price is paid at the boundary: the space must be closed before it can be counted, and the closing is performed from outside the space, by someone who then steps in and works as if there were no outside.

So the bracket closes, and it closes cleanly, and the work inside it is good. That should be the end of the account. It is not, and the reason it is not is hiding inside the title's other word. In the old law of estates there is a condition called abeyance: a title that has no present holder is not thereby extinguished; it persists, vacant and intact, waiting for a claimant the law cannot yet identify. That is the precise condition of the question I bracketed. I did not refute it. I did not dissolve it. I suspended it with full legal force, and it has been accumulating ever since, undiminished, like a count that continues in a register no display is attached to. A procedure tells you what to do with the answerable part of the world. It does not tell you where to keep the remainder. The remainder has to be kept somewhere.

IV. Incarnation

The remainder has to be kept somewhere, and the first thing to admit is that argument cannot keep it. Argument is the instrument of the inside: it runs on the answerable, it is paid by the decidable, and handed a question that has been suspended with full legal force it can only do one of two things, dissolve it or adjourn. But there is a third capacity that has nothing to do with answering. A question that cannot be settled can still be housed. It can be given a body and a power supply and left running where people walk past it. What the procedure brackets, another form can hold open, in public, indefinitely. I did not arrive at this as a theory of art. I arrived at it the way I arrive at everything, by noticing what my hands had already built.

What they had built, first, was a machine that counts. Thirty-two toggle switches in a row, an actuator on a rail, and a register that increments one bit at a time, each carry executed as a physical stroke: the carriage travels, the switch is thrown, the click is audible, the bit exists. There is a lamp at the end. The lamp is wired to light only after the last switch of the last count, which is to say after the full four billion and some have been walked through one by one, which is to say not in my lifetime and not in several stacked end to end. I can state the machine's entire ontology in one sentence: in that box, no signal exists before its operation has run. The light cannot be invoked. It cannot

be gestured at, promised, performed, or rhetorically anticipated; the wiring provides no path for it. Every state the machine displays is the residue of work actually done, and there is no other kind of state available. It took me a long time to see this object as the exact negative of the register I had measured. There: markers in free circulation, execution optional. Here: execution mandatory, and the marker is whatever is left over. The sentences I had counted could say interrogates without interrogating. This machine cannot say one without having counted to it. I want a word for that property, and the word that keeps arriving is an old theological one: not invocation, where the name is called and the body is excused, but incarnation, where there is nothing present except what has taken flesh, and the flesh is the proof.

I built the machine to make one argument about finitude. It made a second argument I had not planned, and noticing it was the strangest moment of recognition in this whole account. The machine does not merely forbid invocation. It defers arrival. Its completion is mathematically certain, datable to the hour if the power holds, and at the same time structurally unwitnessable; the guarantee and the absence of any possible witness are the same fact seen from two sides. I had built, without intending to, the temporal twin of my epistemic bargain. The suspension I had been practicing at the desk, judgment held open, the verdict postponed while the work runs, was standing in the room as hardware: a verdict lamp that will come on, after everyone is gone. The word I had chosen for the desk version, abeyance, turned out to have been describing the machine all along, in its other, older sense, the one about time: not refusal but postponement, an arrival that is owed and not yet served. The two meanings had been one word waiting for me to notice. And the slowness itself, I then understood, was not a poetic decision. Computation in every device around me runs beneath the floor of perception; the result arrives and the labor that produced it is deleted, not metaphorically but by design, the way everything below a noise threshold is deleted. To stretch the count into human time is simply to lower that threshold until the labor comes back. Dilation is restoration. What the interface discards as noise, the machine repays at one operation per stroke.

The machine I am building now applies the same wiring to the thing I measured. It executes, one floating-point operation at a time, the forward pass of a language model over the same institutional corpus, the sixty-two thousand documents, the whole archive of vocabulary without execution. A little over a thousand operations per second, each one surfaced: a pixel, an impulse, a line in a log. At that pace the full pass completes in roughly a hundred and fifty-nine thousand years. The model's central mechanism is named attention, and the name is worth pausing on, because it is the same migration I had watched everywhere else, performed this time by my own field of refuge. The word is borrowed from psychology; it promises a semantics, a mind turning toward what matters. The promise is the marker. What executes beneath the marker is multiplication and accumulation, weighted sums settling toward weighted sums, and the machine's one dis-

cipline is to bracket the borrowed word and exhibit only what runs: not attention but its arithmetic, at a pace where a visitor can stand inside a single act of it, twelve minutes for one token to be weighed against its neighbours, and hear, when a weight crosses a threshold, the word itself whispered once aloud. No one watching it learns what the model means. They witness what it does, which is the one thing the texts in the corpus never had to show.

I should say where I first learned that this order, execution without statement, is even possible, because I did not learn it from machines. Years before any of this I sat in rooms where synchronization was achieved with no clock, no count-in, no protocol of any kind. The word for it in Korean music is *호흡*, breath, and it is exactly literal: the body rises on the inhale, falls on the exhale, and an ensemble keeps time by breathing together, the tempo living in the lift of shoulders. No teacher I ever had could state how it works. I do not say they would not; the knowledge does not exist in storable form. It was transmitted to me through imitation and soreness, muscle by muscle, and three facts about it are checkable: I trained at it for years, my body can still do it, and I still cannot say it. For a long time I filed this as a deficiency of theory. I now think it is the cleanest case I know of the thing I have been circling: knowledge that exists only in execution, for which invocation is not forbidden but impossible, because there is no marker that could circulate without the body attached. The three percussion machines I built once, listening to one another through the air and converging on a common tempo with no conductor and no shared clock, were an attempt to give that order a second body. The point was never that the absence of explicit protocol is a virtue. Plenty of nonsense hides in the unstated. The point is the direction of the defect: breath has execution without statement, and survives; the register I measured has statement without execution, and circulates. Only one of these is dishonest, and it is not the one that cannot speak.

So this is what I think the machines are, stated once and plainly. They are where I keep the questions I am not funded to ask. The bracketed remainder, the external questions, what is real, what completion would even mean, whether anything underwrites the signs, does not dissolve when the pipeline ships. It accrues. And the only form I have found that can hold it without answering it is a measurement that runs past every deadline: certain of its end, deprived of its witness, indistinguishable, at the limit, from a ritual. I mean that comparison technically, not romantically. A ritual is a procedure whose completion no participant will verify and which is performed anyway, exactly, because the exactness is the point. By that definition the machine counting toward its lamp is a ritual, and so is the forward pass crawling toward a done-signal that arrives in a hundred and fifty-nine millennia, and so, perhaps, is any honest measurement taken inside a space whose closure was decided from outside. The gallery turns out to be the one room where such a procedure can run without being asked for its deliverable. That is not a small thing. It may be the entire civic function of the room.

But I notice what I have just done. I have described the repository in sentences. The machines hold the questions by running; this text holds nothing, it only reports, in the very register of performed analysis, with its long noun phrases and its qualifying adjectives, that the holding happens elsewhere. There is one object left in the spiral, and I am writing it.

V. This

The heading of this last section is the only word in the text that does nothing but point. In the languages I build machines in, this is the name by which a running object refers to itself, and it has two properties I have borrowed deliberately. The first is that it is empty. It carries no description, no qualities, no vocabulary; it is pure indication, a surface with nothing printed on it. The second is that it is valid only during execution. While the object's code is running, this denotes; the moment execution ends, the word points at nothing recoverable. There is no way to invoke it from outside. It is the one name that cannot circulate without its body.

So: this. This text is executing now, and I should state plainly what it is while it still can. It is a piece of writing about art, composed for submission to an art institution, which is to say it belongs to the genre I spent years measuring, the register whose markers I counted across sixty-two thousand documents. It is written in English, which is the language of that corpus and is not my language; I have assembled these sentences the way I once assembled the sentences in the reading room, unit by unit, from the outside. I am writing inside my own sample. Every long noun phrase above, every qualifying adjective, every verb that gestures at an operation, falls within range of my own gauge, and I know better than anyone how little the surface of such writing has historically been asked to prove.

I will not be the one to run the test. An instrument pointed at itself reads its own loyalty, and I said earlier what I think of that. The gauge is in the reader's hands now, and it requires no apparatus of mine: whether the connectives above actually connect, whether the adjectives commit, whether anything runs through the middle of these sentences, terminal to terminal, is checkable by anyone with the patience I once spent in a reading room. That checkability is the only credential this text submits. I am aware that the essay, as a form, comes with standing counsel: there is a famous defense that turns the refusal of system into a method, and under its protection a text like this one could decline every such audit on principle. I cannot retain that counsel. The writing I measured sheltered under it for decades. While working I held every candidate reference to the same continuity test, whether the name would make this text easier to verify or would merely exempt it, and the names that offered exemption I left at the door. A text about invocation should be careful what it spends its names on.

There is no conclusion. I want to be exact about why. A conclusion is a verdict, and every verdict in this account is in abeyance: the question of the real, suspended with full legal force, undiminished, accruing; the lamp, owed and unattended; the forward pass, certain and unwitnessable, somewhere near the beginning of its hundred and fifty-nine thousand years. This text can close nothing that the machines have not closed, and the machines close nothing; that is their entire discipline, and by now it is mine. In a few sentences this object stops executing and the word this stops denoting. The questions do not stop. They were never running on the text. They are running on the machines, at one operation per stroke, below every deadline, past every reader, and the most truthful thing I can do with an ending is what the procedure has always done with what it cannot answer: leave it running and step out of the room. Somewhere a carriage is traveling toward a switch. The count continues in a register this sentence is no longer attached to.

THE WORKS

What follows is a brief record of the individual projects described but not narrated in the essay. Readers who prefer to encounter the work through the essay first may return to these notes afterwards; the order is theirs to decide.

Counter (2024)

choiharam.com/projects/counter-en

A machine that counts in binary from 0 to 4,294,967,295, which is $2^{32}-1$, using a 32-bit Linear Feedback Shift Register. A modern computer traverses the same sequence in a few minutes. This machine takes 136 years.

The slowness is not a limitation. Everyday computation runs beneath the floor of perception: billions of operations complete in the blink of an eye, and the labor that produced the result is deleted, not metaphorically but by design. This machine lowers that threshold into human time. Every count is executed as a physical stroke. The actuator travels along its rail, a toggle switch is thrown, the click is audible. Every state the machine displays is the residue of work actually done. Inside it, no signal exists before its operation has run.

Thirty-two toggle switches store the state of each bit in physical space. If the power fails, the switches remember. Pure logical information incarnated through stubborn materiality: no longer a floating sign, but something you can push up and push down with your hand.

At the end of the machine there is a lamp. It is wired to light only at the last bit, the moment all 32 switches reach 1. That moment is mathematically guaranteed. But 136 years exceeds any human lifespan. The lamp will turn on after everyone is gone. The machine is designed to complete, and also designed so that its completion will not be witnessed. The question it holds open has not been refused an answer. It is in abeyance: neither extinguished nor dissolved, intact and undiminished, awaiting an arrival that is owed and not yet served.

Materials: aluminium profile, acrylic, custom electronics, stepper motor, toggle switches.

Decentralized Synchronization (2025)

choiharam.com/projects/decent-sync-en/

Three identical physical entities, each running the same structure and algorithm. A cam mechanism lifts and drops a wooden stomper onto a wooden plate. An electret microphone mounted on each body listens to its neighbours. No central clock. No shared protocol. Synchronization, when it arrives, is the residue of listening.

The project began from a question about digital timing: in a system whose operations accumulate in precise units, how fundamental is that precision, and what happens if something resistant to quantization is introduced into the synchronization process? Two models were already available. In Korean traditional music, ensemble players align without the metronomes and count-ins that Western ensemble practice developed for the same purpose. The mechanism is called *호흡* (*hoheup*, breath): the body rises on the inhale and falls on the exhale, and tempo is kept through the shared lift of shoulders, not through any explicit protocol. None of my teachers could state how it works. It was transmitted through imitation and soreness, muscle by muscle, and three facts about it are checkable: I trained at it for years, my body can still do it, and I still cannot say it. The second model was the firefly. Certain species adjust their flash period in response to neighbouring flashes; no individual is conducting. The three machines in this installation run the same algorithm in the same way: each listens, each adjusts, and the shared tempo emerges from that and nothing else.

The external form is borrowed from the *북* (*chuk*), a wooden percussion instrument used in Korean court music, originally imported from ancient China. Its historical and metaphysical contexts were set aside. What was kept was the rectilinear geometry and the primitive directness of its striking action.

Materials: custom concrete body, wood, custom PCB, stepper motor, Raspberry Pi, custom-trained sound recognition model.

Rhetorical Invocation: a four-layer computational analysis of discourse vocabulary in institutional art writing (2025-2026)

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A study in computational linguistics. Approximately 62,400 texts from 13 major contemporary art institutions, measured against 1,673 peer-reviewed articles across eight discourse categories. Submitted to *Nature*.

Four independent measurement layers converge on the same finding. First, when document length is controlled, institutional art texts adopt post-nominal syntactic structures at rates comparable to academic writing (adjusted $d = -0.12$): the grammatical scaffold of academic prose is fully present. Second, within individual documents, IAE-suffix adjectives form no repeated adjective-noun pairs (mean nMCE = 0.972, $d = +2.00$): the vocabulary is there, but the within-document terminological repetition that constitutes concept-building is not. Third, discourse keywords appear without explicit causal or contrastive connectives in 60.1% of institutional documents, against 20.0% in academic texts (OR = 5.48): theoretical vocabulary is invoked without logical execution. Fourth, two independent language models assign analytical tendency scores 3.5 times below the academic baseline.

The four layers are statistically independent and empirically convergent. The pattern they define is *rhetorical invocation*: the deployment of formal markers of analytical rigour in contexts structurally decoupled from the argumentative operations those markers support in academic writing.

Nayuta : The Transformer (2026)

nayuta.choiharam.com/about

Nayuta (नयुता, *nə.ju.ta*) is a unit in Buddhist numerology for a number so large it exceeds ordinary reckoning, 10^{60} in some traditions. The machine applies this name to a specific computational fact: a single forward pass of BERT-base-uncased over a 58.8-million-token corpus of institutional art writing, executed one floating-point operation at a time, will complete in approximately 159,000 years.

Every visual and auditory event in the installation is a direct, unembellished translation of an underlying computation. Nothing is displayed that has not first been computed. A large projection renders each attention-matrix FMA as a pixel flash; an operation log scrolls in terminal style; when an attention weight crosses a threshold, the word it attaches to and its discourse neighbours are whispered through a spatial audio system. One act of attention, at this pace, takes roughly 12 minutes. The machine never asks whether attention is real. It exhibits only the arithmetic.

The direct predecessor is Counter (2024). Where Counter incarnated 32-bit binary logic through physical toggle switches over 136 years, Nayuta applies the same principle to software: the form is the function, and what the interface ordinarily discards as noise, the labor beneath the result, is repaid at one operation per stroke.

The institutional corpus this machine processes is the same corpus measured in the study below. The machine is not a visualization of those results. It runs the measurement apparatus itself as the artwork, and the questions the study set aside, what is real, what completion would even mean, are not answered here. They are kept running.

corpus-ngrams

ngram.choiharam.com

An explorable n-gram surface of the institutional corpus the study measured. Thirteen institutions, searchable. The study's findings are about structure; this interface is about surface. Both are necessary.

Nayuta (web)

nayuta.choiharam.com

The browser version of the installation: the forward pass, rendered live. The full 159,000-year computation is running now, at one operation per moment, adjacent to this text.

Crossword

crossword.choiharam.com

Card-sized crossword puzzles distributed at the exhibition and colloquium. The vocabulary is drawn from the institutional corpus. The grid is the only part of this project that fits in a pocket.

COLOPHON

Scale — Corpus ~62,400 texts / 13 institutions, against 1,673 peer-reviewed articles. Nayuta’s forward pass runs at ~1,000 operations per second, completing in ~159,000 years. Counter walks $2^{32}-1$ states in ~136 years.

Author — Haram Choi, 2026.

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Source — github.com/oudeis01/nayuta, github.com/oudeis01/nayuta_bert, github.com/oudeis01/nayuta_web, github.com/oudeis01/nayuta_crossword.