

# The Prescribed and the Realized: A Measurement Device for a Chromatic Codex

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March 28, 2026

*Multimodal Institute Papers — codex*

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This paper specifies a measurement device and states its current condition. A painter who cannot verify color perceptually built a deterministic rule assigning chromatic structure to each of the twenty-four tonalities, and executed it across 379 catalogued paintings. An independent computational layer records, for each work, the colors actually present on the surface: ten k-means clusters with hex values, chroma, proportional weights, and family assignments, alongside texture, brightness, and spatial metrics, under a versioned methodology standard and bound by checksum. The measured half of the instrument is operational. The prescribed half is not: the codex has never been extracted as a numerical output, and there is therefore, at present, no reference against which the measurement can be read. Two contaminations internal to the documentation system are identified and excluded. The first is an editorial layer that begins from the prescription, observes the variance between prescription and surface, and resolves that variance into a plausible text — thereby consuming the exact quantity the instrument exists to record. The second is a set of theoretical keywords written into the measurement layer itself. Neither may enter the protocol. The gap between prescription and surface is acknowledged to be a composite: it passes through the codex, the name printed on a paint tube, the pigment, the mixture, the drying surface, the maker's eye, and the sensor, and these links are not separately isolable. The device measures the output of that chain and does not claim to have opened it. What the configuration permits, and what nothing else the author knows of permits, is a question: whether the divergence between prescribed and realized palettes is noise, drift, or a stable operator belonging to a single hand. The paper does not answer it. It specifies the instrument that will.



## **The laboratory was built in the shape of the instrument's known aperture — 379 paintings, one hand, one constraint**

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*Multimodal Institute Papers, PUB-PAP0007*

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### 1. What This Paper Does

This paper specifies an instrument. It does not propose a theory of art, a theory of reception, or a theory of anything else. It describes a measurement device, states what the device can currently record and what it cannot, identifies two sources of contamination internal to the system that must be excluded before any measurement is valid, and formulates the question the device makes askable for the first time.

The device is not finished. Half of it works. This paper is written now, in that condition, because a paper that specifies an instrument before knowing what the instrument will show is a different kind of document from one written afterward — and only the first kind can be checked.

The configuration is this. A painter cannot verify color perceptually. He built a deterministic rule that assigns a chromatic structure to each of the twenty-four major and minor tonalities. He executed that rule 379 times. An independent computational system measures, work by work, the colors actually present on the surface — colors he cannot fully confirm with his eye. The distance between what the rule prescribed and what the hand produced is therefore, in principle, recoverable.

Nothing in this configuration is unusual on its own. What is unusual is that all four elements are present at once, in a single body of work, over two decades, with the record kept. That conjunction is what makes the device a device.

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### 2. Why the Laboratory Exists

The instrument was not designed. It accumulated, under a constraint that made each of its parts necessary in turn.

**The constraint.** The practitioner is color blind. Color as ordinarily available — a stable, nameable, verifiable property of a surface — is not accessible to him in the way it is accessible to most painters. What is available, with the precision of a trained pianist, is harmonic relation: intervals, voicings, tension and resolution, the architecture of a chord.

**The rule.** From that constraint a codex was built: a deterministic mapping from harmonic structure to chromatic structure, covering all twenty-four tonalities. It is not synesthesia. It is not a perceptual gift, not an involuntary cross-modal association, and it does not reveal a correspondence that was waiting to be found. It is a rule, stipulated by a person who had no choice but to stipulate one, and it produces its output whether or not anyone finds that output apt. What makes it usable is not that it is true. What makes it usable is that it is executable, and that its execution can be checked against its specification.

**The prosthesis.** Between the rule and the canvas sits a further apparatus, and it is worth naming because it is invisible to anyone who has not needed it. Paint tubes carry names. The practitioner uses them. A lexical codex — the label on the tube — is recruited to compensate for a chromatic one. Language is substituted for perception at the exact point where perception fails. This is not a workaround at the margins of the practice. It is a structural component of the execution chain, and no account of the gap can proceed without it.

**The measurement.** Twenty years of practice under these conditions produce a large body of work whose chromatic content the maker cannot fully verify. The computational layer was built for that reason and no other. It closes the loop the eye cannot close. The machine records what the constraint withholds.

The laboratory was built in the shape of the instrument's known aperture. Each component exists because a specific verification was unavailable. This is why the device has the form it has, and it is the only reason.

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### 3. What the Instrument Currently Records

The measured half is operational.

Every work in the *Synesthetic Explorations* corpus — **379 paintings**, catalogued under AQC references, each with a certificate and a persistent identifier — carries a computational image analysis record generated under a versioned methodology standard (MMIDS-CMP-2025). The record is produced algorithmically from the source image. It is not perceptual, not authored, and not reviewed by the maker.

Each record contains:

- **Color distribution** by k-means clustering: ten dominant colors plus accents, each with a hex value, a proportional weight, a family assignment, and a chroma value.
- **Texture metrics**: Haralick features, roughness, edge density, gradient statistics, pattern complexity.
- **Brightness and contrast**: distribution, entropy, dynamic range, multiscale contrast, tonal balance.
- **Spatial organization**: coherence, clustering, hue concentration, saturation distribution, transition smoothness.

The record is versioned, dated, and bound to its content by a SHA-256 checksum. The methods are deterministic and reproducible. Values are stored in hex; conversion to CIELAB is a deterministic transformation and is performed at analysis time, not at record time, so that no perceptual assumption enters the stored data.

This is the realized palette: what the hand actually put on the surface, recorded by a system that does not share the maker's aperture.

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### 4. What the Instrument Does Not Yet Record

The prescribed palette does not exist in numerical form.

The codex is deterministic and complete across all twenty-four tonalities, but its output has never been extracted as a set of coordinates. There is no table that maps a chord to a target palette in a perceptually meaningful space. Without it, there is nothing to compare the measurement against. The instrument has an output and no reference.

This is the entire remaining construction, and it is a single, well-defined task: a pure function from harmonic structure to chromatic coordinates, generated from the codex alone, never from a painting.

The word *alone* carries the whole weight of the paper, and §5 explains why.

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### 5. Two Contaminations Internal to the System

A shortcut is available, and it would destroy the measurement.

**The first contamination is an editorial artifact.** The documentation system contains a layer — internally designated T48 — that produces, for each work, a prose account of its chromatic content in relation to its tonality. This layer serves a legitimate purpose: it allows a work to be presented publicly without requiring the maker to explain a perceptual condition on every label, in every catalog entry, to every visitor. That purpose is not in question here.

But the layer operates in a specific way, and the way is disqualifying. It begins from the prescription. It observes the variance between prescription and surface. It resolves that variance into a plausible text.

The variance it resolves **is the quantity the instrument is built to record**. An account that reconciles a prescribed violet with a realized rose has consumed the measurement in order to produce the sentence. Any protocol that reads the prescribed palette out of this layer will find, by construction, that the gap is small — because the layer was made to make it small.

The artifact is therefore excluded from the measurement protocol. Not deferred, not adjusted: excluded, permanently and in principle. It is a mediation object. It belongs to the public presentation of the work and it does its job there. It has no evidential role whatsoever, and the prescribed palette must be generated without any contact with it.

**The second contamination is lexical, and it sits inside the measurement layer itself.** The computational records carry, alongside their numerical content, a set of thematic keywords: *chromesthetic mapping*, *translation*, *synesthetic art*, and, in at least one case, a summary characterization of the work's dominant chromatic family. These are annotations. They were written in the vocabulary of a theoretical framework, and they were written by someone who knew what the work was supposed to be.

The numerical content is unaffected: hex values, chroma, proportions, texture metrics, and checksums are produced by the algorithm and carry no interpretation. But the annotations are contamination in waiting. The protocol consumes only the numerical fields. Keyword and thematic content in the measurement layer is not evidence, is not read, and is not used, and the fields are to be regenerated without theoretical vocabulary.

Naming these two exclusions is not a concession. It is the condition under which anything measured here can be believed.

## 6. The Chain of Gaps

Even with both halves built and both contaminations excluded, one thing must be said plainly, because a reader will otherwise say it first.

The distance between a prescribed palette and a realized one is not a single gap. It is the composite of a chain, and the chain is not decomposable with the evidence available:

- from the chord to the prescribed color, by the codex;
- from the prescribed color to the selected tube, by way of a name printed on a label;
- from the tube to the pigment as it leaves it;
- from the pigment to the mixture;
- from the mixture to the dried surface;
- from the surface to what the maker's eye returns to him;
- from the surface to what the sensor records.

Each link introduces a displacement. None can be isolated from the others without an experimental apparatus that does not exist. The maker cannot say which link is responsible for any given divergence, and this paper does not claim otherwise.

But a composite is measurable even when its components are not. This is the ordinary condition of physical measurement: total error is quantified before it is decomposed, and it is quantified precisely in order that it may later be decomposed. The device measures the output of the chain. It does not pretend to have opened it.

## 7. The Question the Device Makes Askable

With the prescribed palette generated and the exclusions enforced, one question becomes answerable that was not answerable before:

**Is the gap noise, drift, or an operator?**

If the divergence between prescribed and realized palettes is randomly distributed across works, tonalities, and regions of color space, then it is noise, and the finding is that the execution chain is not systematic.

If it narrows over time, it is drift, and the finding concerns the crystallization of a rule under repeated execution.

If a given prescription reliably produces a given displacement — if a prescribed violet consistently arrives as a rose — then the gap is neither noise nor drift. **It is a function**, and it is stable, and it is measurable, and it belongs to a single hand.

This paper does not know which of the three obtains. It cannot know, because the prescribed palette has not been generated. That is exactly the state a paper specifying an instrument should be in.

What can be said is narrower and, for that reason, worth saying: the configuration required to ask the question at all is rare. It requires a perceptual constraint, a deterministic rule, a long execution, and an independent measurement, present together in the same practice, with the record kept throughout. Where any one is absent, the question cannot be posed. Here they are all present, and they have been for twenty years.

**8. What This Paper Does Not Claim**

The instrument measures the divergence between a stipulated chromatic rule and its execution by one painter under one perceptual condition, in a deterministic regime.

It establishes nothing about art. It establishes nothing about how the works are received, what they mean, whether they are good, or whether the codex that generated them is apt. It does not demonstrate that the rule is correct, and the question of whether a rule of this kind can be correct is not one the instrument is competent to address. A rule that is stipulated is neither true nor false. It is executed, or it is not, and the extent of its execution is what is being measured — nothing more.

The device produces one thing: a record of the distance between what was specified and what was made, in a case where the maker could not himself close that distance.

That is a small claim. It is also, as far as the author is aware, a claim no one else is positioned to make.

ISSN: applied for — U.S. ISSN Center, Library of Congress

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Published by Art Quam Anima Publishing New York,  
an assumed name of AQA Publishing LLC

c/o Northwest Registered Agent, 418 Broadway Ste N  
Albany, NY 12207, USA  
+1 917-764-5470

NY DOS ID 7624376 · Assumed Name ID 7658709

[publishing.artquamanima.com](https://publishing.artquamanima.com) (<https://publishing.artquamanima.com>)

Last updated: 2026-07-23

Persistent URI: <https://publishing.artquamanima.com/en/papers/2026/03/the-prescribed-and-the-realized-a-measurement-device-for-a-chromatic-codex-29z0.pdf> (<https://publishing.artquamanima.com/en/papers/2026/03/the-prescribed-and-the-realized-a-measurement-device-for-a-chromatic-codex-29z0.pdf>)