Research Monograph Series

The Interface of P versus NP and Human Life: Rethinking Verification, Generation, and the Present through Generative Topological Ontology

Author: Tomokazu Tanaka (bigakusha-haha)
ORCID: https://orcid.org/0009-0009-3796-5889
Affiliation: Sayama Aesthetics School / Institute of Aesthetics
Version: 1.0
Last Updated: September 2026
Status: Ongoing Research

Research Monograph

Tomokazu Tanaka (bigakusha-haha)
Version 1.0, September 2026

Publication Information

Copyright

© 2026 Tomokazu Tanaka (bigakusha-haha). All rights reserved.

License

This work is distributed as a Research Monograph.

No part of this publication may be reproduced, distributed, or transmitted in any form or by any means without prior written permission of the author, except for brief quotations used in academic review or scholarly citation.

Suggested Citation

Tanaka, Tomokazu (bigakusha-haha). 2026.

The Interface of P versus NP and Human Life:
Rethinking Verification, Generation, and the Present through Generative Topological Ontology

Research Monograph Series, Version 1.0.

Sayama Aesthetics School / Institute of Aesthetics.

Research Monograph

Version: 1.0

Last Updated: September 2026

Status: Ongoing Research

Abstract

This paper connects the P versus NP problem with the generative studies of bigakusha-haha and formulates a P-versus-NP-like question concerning human life. It does not, however, use the complexity classes P and NP to classify forms of life or kinds of rationality. P is the class of decision problems decidable in deterministic polynomial time; NP is the class of decision problems whose positive instances have certificates verifiable in polynomial time. Whether these classes coincide remains an open problem. Preserving these definitions, the paper uses the asymmetry between verification and generation as a restricted reference model for examining the structure of lived existence.

Let a situation be represented by an input x, a possible response by a candidate certificate y, and the relation between them by a verifier V(x, y). The past is interpreted as the conditions and histories encoded in the input; the future as a candidate not yet actualized; and the present as an interface that connects the possibility of such a candidate to a verifiable relation. Existential quantification in NP expresses the existence of a candidate as a property of the present problem instance. In this limited sense, the future possibility of an answer can be read as folded into the present. This is an ontological interpretation of the certificate relation, not a standard mathematical use of the term “convolution.”

The paper defines a P-like mode of life, metaphorically, as one in which situations are processed through established rules and procedures and the present is experienced as the application of answers already stabilized in the past. An NP-like mode of life accepts an asymmetry in which a candidate may be verifiable once supplied, while its generation cannot be anticipated by the procedures currently available. The “non” in this account does not mean anti-rationality or disorder; it means that something has not yet been generated or predicted by the prevailing rational procedures. This model is neither a computational classification of human beings nor a theorem derived from P versus NP.

The argument then brings this model into relation with Generative Topological Ontology: the priority of relation, being as connectability, interface-induced topological transition, self-externalization, the wound as a mark, workhood, and the generative force of evaluation. In formal NP, the verifier is fixed. In art and lived experience, however, an encounter with a candidate or an act of evaluation may alter the criteria of verification themselves. Such a reorganization lies beyond standard P versus NP, yet it is consistent with the interface ontology of Generative Studies. The paper concludes that the P-versus-NP-like question of human life is

not whether people belong to P or NP, but how past conditions and future candidates connect through the present interface and how that connection transforms the criteria of rationality and evaluation.

Keywords

P versus NP, Generative Topological Ontology, Generative Studies, human life, verification, certificate, information space, informational time, Interface Ontology, Self-Externalization, wound, Workhood, modern rationality

Contents

1. Introduction: 1

Connecting a Complexity-Theoretic Question to Life

2. Mathematical Definitions and Methodological Limits 2

3. A P-versus-NP Model of Life: Input, Candidate, and Verification 3

4. Modern Rationality and the Meaning of “Non” 5

5. The Generative Present and the Interface 6

6. Self-Externalization, Wound, and Workhood 7

7. Creation, Viewing, and Evaluation as Discrete Positions 8

8. Conclusion: 9

The P-versus-NP-Like Question of Life

References 11

Research Method 13

1. Introduction:

Connecting a Complexity-Theoretic Question to Life

The P versus NP problem is one of the central open questions in computational complexity theory. In a familiar formulation, it asks: if a proposed answer can be checked efficiently, can an answer also be found efficiently? The question concerns whether verification after a candidate has been supplied and solving a problem before a candidate is available coincide under the same resource measure. In The Generative Topology of Information Space, bigakusha-haha does not identify this problem with creativity itself. Rather, it is treated as a rigorous reference model showing that proximity to verification and proximity to construction need not coincide within a shared problem setting (Tanaka 2026c).

This paper extends that discussion by connecting P versus NP to human life. The connection is not presented as a mathematical consequence. It asks instead about the relation between living by applying answers and rules already established, and living by taking into the present the possibility of a candidate that has not yet appeared. When these are described as “P-like” and “NP-like,” respectively, the terms are limited metaphors for modes of existence, not complexity classes into which human beings can be sorted.

This limitation is consistent with Generative Topological Ontology. The ontology understands being not as a fixed substance but as connectability generated through relations. Here, “topology” is not a direct transfer of the mathematical notion of a topological space; it names a generative structure describing what can connect to what, which boundaries can be crossed, and which differences are retained (Tanaka 2026a; 2026c). The connection with P versus NP therefore does not reduce ontology to complexity theory. It uses the relations among verification, generation, and computational resources as a restricted point of reference for thinking about the topology of lived existence.

The central claim is as follows:

> The P-versus-NP-like question of human life concerns the asymmetry and connectability between processing the present answer through established procedures under conditions inherited from the past, and allowing an answer possibility not yet actualized to transform the present.

2. Mathematical Definitions and Methodological Limits

In computational complexity theory, P is the class of decision problems decidable in deterministic polynomial time. NP can be defined as the class of decision problems for which every positive instance has a polynomial-length certificate that can be verified in polynomial time. A language L is in NP if there is a polynomial-time verifier V and a polynomial p such that:

$$x \in L \Leftrightarrow \exists\, y : |y| \leq p(|x|) \text{ and } V(x, y) = 1$$

The P versus NP problem asks whether P = NP. Since P is contained in NP, the unresolved question is whether the inclusion is strict (Cook 1971; Cook 2006). NP does not mean “not P” or “hard.” NP problems may all belong to P, or some NP problems may lie outside P; neither possibility has been proved.

P and NP are classes of decision problems. Search problems that ask for an actual solution are related to, but not identical with, decision problems; frameworks such as FNP are relevant to their formal treatment. For some problems, decision and certificate search are closely connected, but this does not license classifying every act of creation as an NP problem. Maintaining this distinction is necessary for the argument developed here.

Accordingly, mathematical P cannot be defined as “the past,” NP as “the future,” P as “rationality,” or NP as “irrationality.” Complexity theory concerns formalized problems, input length, algorithms, certificates, verifiers, and computational resources. Past, future, present, and rationality are ontological and temporal interpretations added to that formal structure; they are not part of the definitions themselves.

3. A P-versus-NP Model of Life: Input, Candidate, and Verification

To connect complexity theory to human existence, this paper limits the analogy to three terms. First, the input x represents a concrete situation conditioned by the body, memory, institutions, relations, and history. Second, a candidate y represents an action, answer, work, choice, or possible new relation that responds to that situation. Third, the verification relation V(x, y) represents a procedure for examining how the candidate responds, which conditions it meets, and which relations it opens.

In this analogy, the past is the history and constraints inscribed in the input x; the future is the candidate y not yet actualized; and the present is the verification interface that relates the input to the candidate. The existential quantifier ∃ y in the definition of NP states that the existence of an appropriate candidate is a property of the problem instance x. Read temporally, this permits the interpretation that the possibility of a future answer is folded into the present problem.

Existential quantification, however, does not itself discover the candidate, nor does it make time run backward. “Convolution” is not part of the standard definition of NP. It is a philosophical expression for the relation in which the possible existence of a candidate helps constitute the present problem. This distinction preserves the temporal interpretation without changing the mathematical definition.

In this model, a P-like mode of life is a metaphor for experiencing situations as processable through established rules, evaluation axes, conventions, or algorithms. A person applies answers stabilized in the past to the present and judges a situation according to known criteria. The present then appears as a site where past answers are reapplied.

An NP-like mode of life is a metaphor for accepting an asymmetry in which a candidate may be verifiable once supplied, although it cannot be derived in advance from the procedures currently available. The answer that has not yet appeared is retained as a possibility that orients the present question, rather than being placed only in a distant future. “NP-like” here does not mean that actual human problems belong to NP; it means that the structure of certificate presentation and verification is analogically transferred to a model of life.

The P-versus-NP-like question of human life can therefore be defined as follows:

> What resource-based, temporal, and institutional distance separates the ability of established rational procedures to calculate or decide an answer from the ability to verify a candidate once it

has appeared? Can a new interface alter that distance?

This question does not imply an answer to the mathematical P versus NP problem. Unless the resources and distances of human life are operationalized as a computational measure, an identity with formal complexity classes cannot be established. This paper proposes a structural model for Generative Studies, not a mathematical theorem.

4. Modern Rationality and the Meaning of “Non”

Modern rationality cannot be identified with P. P is a mathematical complexity class; modern rationality is a historical, philosophical, and institutional mode of thought. Within the limited analogy proposed here, one aspect of modern rationality can be described as a P-like orientation: inputs, goals, and evaluative criteria are fixed, and answers are efficiently calculated or optimized according to established rules.

In The Loss of Doubt and the Derivative Proliferation of Modern Rationalism, bigakusha-haha does not criticize reason or science as such. The problem arises when the uncertainty and doubt from which concepts emerged are forgotten, while their resulting forms are generalized, institutionalized, and automated. When predictions of the future predefine present action and measurable indicators come to represent reality as a whole, the present becomes a point of adjustment to an anticipated future or inherited criteria rather than a site of new generation (Tanaka 2026d).

In this context, calling NP “irrationality” is inaccurate. NP is a mathematically precise class situated within formal rationality, with certificates and verifiers. In the model of life, “non” does not mean the negation of reason, unverifiability, or disorder. It names the relation in which something has not yet been anticipated, generated, or predicted by current rational procedures: the difference between existing procedures and a future candidate.

To “live NP,” therefore, is not to retreat into irrationality. It is to refrain from immediately erasing a candidate that current criteria cannot yet calculate as error or noise, and to retain it as a possibility open to generation and verification. When the candidate appears, current rules may verify it; alternatively, it may require revision of the criteria themselves. The latter possibility is outside the standard formalism of NP, but it is a problem for Generative Studies.

5. The Generative Present and the Interface

In bigakusha-haha's account of time, the present is not only a midpoint between past and future. The past operates as a condition of the present, while the future—through prediction, expectation, purpose, or unrealized possibility—also orients its meaning. The present is the interface at which these temporal forces meet, become localized, and are rearranged. In this sense, "folding the possibility of a future answer into the present" is a metaphor for the relation through which a future candidate helps constitute the current situation.

This present neither merely repeats a completed answer from the past nor freely anticipates the future. Let the relation between the concrete situation x_t and the candidate y_t at time t be represented by the verification relation V_t(x_t, y_t). Contact with a candidate and the response to it may change both the next situation and the criteria of verification:

$$(x_t, V_t) \rightarrow[y_t] (x_{t+1}, V_{t+1})$$

This expression is a conceptual schema for recursive change at the interface of life and art, not a theorem in complexity theory. In standard NP, the verifier V is fixed. In art and lived experience, however, the criteria V_t may change in response to what a candidate reveals, who evaluates it, and what responses or consequences follow.

In Generative Topological Ontology, an interface is not a neutral passage that transparently connects two already established terms. It is a boundary condition that brings different phases into contact and generates a new reality while retaining difference. Being does not appear as a substance prior to relation but as relational connectability. Verification of a candidate in the present may therefore do more than compare it with an existing answer; it may alter what can count as an answer (Tanaka 2026a; 2026b).

6. Self-Externalization, Wound, and Workhood

Self-Externalization is not the act of copying an already completed self into the external world. It is an ontological movement in which the self leaves a mark through contact with what is other than itself and is changed through that contact. The mark is not wholly owned by the self; it generates new interpretations and connections through other people, media, institutions, and time. After Self-Externalization, the self cannot fully return to its prior state (Tanaka 2026b).

This irreversibility connects to the generative theory of the wound. A wound is not simply damage or pain; it is a mark of history that prevents the states before and after an event from becoming fully identical. In the topological difference between information and wound, an increase in surface information does not entail a deepening of history. Information may circulate rapidly while the irreversible histories left by its generation in bodies, places, and relations are externalized and rendered invisible. A work, by contrast, does not merely add information; it leaves a trace in the relation between self and other and assumes a new possibility of connection (Tanaka 2026e).

Workhood therefore cannot be reduced to the completeness or apparent correctness of an object. Workhood is the capacity to preserve the history generated through Self-Externalization while remaining open to the next generation by others. Art does not merely optimize a predetermined evaluative function. It can become an interface that rearranges what is evaluated, what is asked, and who occupies the positions of generation, viewing, and evaluation.

7. Creation, Viewing, and Evaluation as Discrete Positions

Social institutions divide creation, viewing, and evaluation among different people. In bigakusha-haha's account of information space, however, these are not separate beings with different essences but discrete positions within the same generative phase. Observation and evaluation already operate within creation; meaning-making and judgment operate within viewing; and evaluation produces conditions of visibility and preservation (Tanaka 2026c).

This account also prevents the conflation of a computational verifier with artistic evaluation. A formal verifier decides whether a certificate meets conditions under fixed rules. Artistic evaluation does more than describe a judgment: it generates opportunities for a work to be seen, preserved, circulated, cited, imitated, and used as a condition for later production. Evaluation may have a phase resembling verification, while also changing how its object exists thereafter.

A work is not a container through which an author transmits a completed meaning in one direction. It is an interface connecting author, work, viewer, institution, language, and place, and exchanging or rearranging their positions. Such movements can open paths and neighborhoods that did not previously exist. Creation consists not only in adding an informational item but also in generating new connectability.

8. Conclusion:

The P-versus-NP-Like Question of Life

This paper has defined a restricted structural correspondence between P versus NP and the generative studies of bigakusha-haha, centered on the asymmetry between verification and generation rather than on mathematical identity. In mathematics, P and NP are complexity classes, and P versus NP remains unresolved. Human life is not sorted into these classes, modern rationality is not P, and NP does not mean irrationality.

Within these limits, a P-like mode of life is a metaphor for applying answers, rules, and evaluative axes established in the past to process the present. An NP-like mode of life is a metaphor for including a not-yet-actualized candidate in the present problem and maintaining a relation through which it can be verified if it appears. The present is reducible to neither past nor future; it is the interface at which past conditions and future candidates come into contact.

At the interface of art and life, the criteria of evaluation themselves may also change. A candidate is not only tested by present rules; it may demand new criteria and rearrange the positions of creation, viewing, and evaluation. This recursive transformation lies beyond standard P versus NP, yet it is consistent with bigakusha-haha's ontology, in which relation precedes being and interfaces generate topological transitions.

The P-versus-NP-like question that bigakusha-haha addresses in human life can therefore be formulated as follows:

> How does the present, conditioned by the past, repeat answers already accepted? How can an answer possibility that has not yet appeared be folded into the present and transform its interface and criteria of rationality?

This question does not claim to solve P versus NP. Rather, by preserving the formal distinctions of complexity theory, it offers a framework for studying connectability and asymmetry in human life without conflating generation, verification, temporality, and rationality.

References

Bennett, Charles H. 1982. “The Thermodynamics of Computation—A Review.” International Journal of Theoretical Physics 21: 905–940. https://doi.org/10.1007/BF02084158.

Cook, Stephen A. 1971. “The Complexity of Theorem-Proving Procedures.” In Proceedings of the Third Annual ACM Symposium on Theory of Computing, 151–158. New York: Association for Computing Machinery. https://doi.org/10.1145/800157.805047.

Cook, Stephen A. 2006. “The P versus NP Problem.” Official problem description for the Clay Mathematics Institute Millennium Prize Problems. https://www.claymath.org/millennium/p-vs-np/.

Hartmanis, Juris, and Richard E. Stearns. 1965. “On the Computational Complexity of Algorithms.” Transactions of the American Mathematical Society 117: 285–306. https://doi.org/10.2307/1994208.

Karp, Richard M. 1972. “Reducibility among Combinatorial Problems.” In Complexity of Computer Computations, edited by Raymond E. Miller and James W. Thatcher, 85–103. New York: Plenum Press. https://doi.org/10.1007/978-1-4684-2001-2_9.

Landauer, Rolf. 1961. “Irreversibility and Heat Generation in the Computing Process.” IBM Journal of Research and Development 5 (3): 183–191. https://doi.org/10.1147/rd.53.0183.

Shannon, Claude E. 1948. “A Mathematical Theory of Communication.” Bell System Technical Journal 27 (3): 379–423; 27 (4): 623–656. https://doi.org/10.1002/j.1538-7305.1948.tb01338.x; https://doi.org/10.1002/j.1538-7305.1948.tb00917.x.

Tanaka, Tomokazu (bigakusha-haha). 2026a. Axioms of Generative Topological Ontology: Foundations of Generative Being. Research Memorandum, Version 1.0. Sayama

Aesthetics School / Institute of Aesthetics.

———. 2026b. The Limits of Self-Externalization and the Generation of Being: An Interface Ontology within Generative Topological Ontology. Research Monograph, Version 0.9. Sayama Aesthetics School / Institute of Aesthetics.

———. 2026c. The Generative Topology of Information Space: P versus NP, the Discrete Positions of Creation, Viewing, and Evaluation, and Interface Ontology. Research Monograph, Version 1.0, September 22, 2026. Sayama Aesthetics School / Institute of Aesthetics.

———. 2026d. The Loss of Doubt and the Derivative Proliferation of Modern Rationalism: Scientistic Intellectual Phase-Locking, the Lost Present, and the Critical Point of Self-Objectification. Research Monograph, Version 1.0, July 2026. Sayama Aesthetics School / Institute of Aesthetics.

———. 2026e. The Topological Difference Between Information and Wound: A Generative Theory of Asymmetry, Irreversibility, Creativity, and Workhood. Research Monograph, Version 1.0, September 22, 2026. Sayama Aesthetics School / Institute of Aesthetics.

Research Method

This text is published as a Research Memorandum within the continuing development of Generative Topological Ontology.

The concepts, definitions, hypotheses, and arguments presented here record the theoretical position reached at the time of writing and publication. They should not be understood as a finally established theoretical system. They may be expanded, revised, redefined, or reorganized through future research, artistic practice, interaction with reality, academic dialogue, and peer review.

This research does not regard only completed theories as legitimate research outcomes. It also treats the processes through which concepts emerge, become interconnected, undergo transformation, and are integrated into a theoretical structure as significant objects of inquiry. Accordingly, this memorandum should be understood not merely as an incomplete draft, but as a record of a particular phase in the generation of the theory.

The public release of a Research Memorandum is not intended to present a developing theory prematurely as a completed one. Rather, it is a method of documenting the generative processes of thought and practice, enabling their subsequent examination and reconstruction, and opening them to academic and artistic dialogue from different perspectives.

If the contents of this memorandum are subsequently developed into a peer-reviewed article, scholarly monograph, or other formal research output, the finalized work will be identified as a separate and fixed document.

When citing or referring to this memorandum, please include the title, author, version number, and date of the most recent update. Different versions may contain substantive differences in concepts, definitions, and lines of argument.

This Research Memorandum is not a final conclusion. It is one theoretical position reached within the continuing formation of Generative Topological Ontology and, at the same time, an interface open to further generation.