

AESTHETICS TO NEURAL SUBSTRATE: REFRAMING RASA THEORY FROM THE NĀṬYAŚĀSTRA FOR AFFECTIVE NEUROSCIENCE AND DIGITAL HUMANITIES RESEARCH

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ABSTRACT

The Nāṭyaśāstra (c. 200 BCE–200 CE), of Bharatamuni, is among the most exhaustive extant treatises on performative aesthetics, prescribing a systematic epistemology of human experience through the theory of Rasa (aesthetic sentiment). The Nāṭyaśāstra, despite its foundational nature within Indian Knowledge Systems (IKS), has not then been utilized rigorously in emphases outside of the particular methodology that it offers and there have not been methodological approaches to bring this into line with some contemporary academic rigor beyond its regular dimensions. This article attempts to fill that gap with an empirically grounded, analytical framework. Using a comparative method first we attempt to show how the dramatic conventions of Nāṭyaśāstra match in structure with those of statecraft prescribed by the Arthaśāstra and are dramatized in Viśākhadatta’s Mudrārākṣasa (c. 4th–9th century CE), arguing that ethical epistemologies and aesthetic need share a unified theory of persuasion and ethical governance as an illustration. Second, we provide an empirical foundation to Rasa through its experiential constructs—Sādhāraṇīkaraṇa (universalization), tanmayībhava (neural absorption), and Bhāvanā (mental imagery)—by mapping them to peer-reviewed findings in affective neuroscience regarding the neurological mechanisms of mirror neuron activation, interoceptive prediction, and limbic modulation. Third, we attempt to present a systematic review of existing digital humanities projects both for corpus generation as future possibility; mapping out their methodological rigor and validation protocols insofar as educational implications transpiring from NEP 2020 are concerned. Arguing that the Nāṭyaśāstra’s epistemological architecture provides a salient, methodologically generative framework for twenty-first-century affective, ethical, and human-technology interaction research, the study proceeds through a close reading of the Nāṭyaśāstra’s construction and application.

KEYWORDS: *Nāṭyaśāstra; Rasa Theory; Affective Neuroscience; Sādhāraṇīkaraṇa; Indian Knowledge Systems; Digital Humanities Arthaśāstra;*

1. Introduction

The Nāṭyaśāstra (c. 200 BCE–200 CE), of Bharatamuni, holds a one-of-a-kind place in the history of human thought: it is both a how-to manual for theatrical performance as well as an epistemology of collective emotion and a philosophical treatise about aesthetic experience. Written over several centuries and amended through layers of commentary — most

significantly Abhinavagupta’s tenth-century Abhinavabhāratī — the text encodes a theory of knowledge that is irreducibly embodied, intersubjective and affectively grounded. Its core concept, Rasa (literally “essence” or “flavor”), does not evoke a private inner feeling so much as an emergent common state that emerges from the structured interaction of performer, spectator and aesthetic environment.

Despite being a bedrock text in Indian Knowledge Systems (IKS), the Nāṭyaśāstra has remained on the periphery of any contemporary interdisciplinary scholarship. Where it has engaged, the engagement has been either strictly philological – that is, concerned with textual editing and translation – or reverentially exegetical, treating its categories as culturally bounded artifacts rather than analytically generative frameworks. This paper takes issue with both tendencies. It engages the Nāṭyaśāstra as a living epistemological resource, whose primary constructs – Rasa, Sādhāraṇīkaraṇa, Tanmayībhava, Bhāvanā – are precise enough to survive methodological scrutiny, and productive enough to share insight when placed in an ongoing dialogue with affective neuroscience and digital humanities.

This paper unfolds in three movements. First, it provides a close reading of Rasa theory as in systematic taxonomy of affective knowledge, examining Viśākhadatta's Mudrārākṣasa as an exemplary case study for how the persuasive architecture of Nāṭyaśāstra works outside the theatrical stage. Second, it translates the experiential constructs of Rasa theory onto peer-reviewed insights in affective neuroscience, claiming that the phenomenological observations by Bharatamuni and Abhinavagupta prefigure – and in some ways surpass – contemporary neuroscientific descriptions about empathic connection, neural entrainment and peak aesthetic experience. Thirdly, it critically reviews new digital humanities projects that implement Nāṭyaśāstra principles in virtual reality and AI environments, highlighting both their methodological promise and current limitations.

Together, these three movements lend support to a further claim: that the epistemological architecture of Nāṭyaśāstra represented a decolonially relevant and methodologically sound framework for twenty-first-century research into affective science, human-technology interaction, and education policy – and in particular the specific challenge posed by India's National Education Policy 2020 which refers specifically to the need to integrate Indian Knowledge Systems into contemporary curricula.

2. Methodological Framework

The present study uses an interpretive-analytic methodology that combines three different yet mutually complementing research modes. The general design is modeled after what Creswell and Creswell [3] call “a multi-strand mixed-method approach” with adaptations for humanities research: (1) hermeneutic close

reading of primary and secondary classical texts, (2) a systematic literature review of peer-reviewed empirical findings in cognitive and affective neuroscience, and (3) structured critical appraisal of contemporary digital humanities applications. The study is explicitly post-positivist in its philosophical positioning; it acknowledges the interpretive dimensions of textual analysis while insisting on evidential rigor for empirical claims originating from neuroscience and digital performance research.

The primary corpus for this study includes: (a) Nāṭyaśāstra by Bharatamuni, particularly the Ghosh translation [1], with relevant passages referenced against the critical edition by Ramakrishna Kavi [6]; (b) Abhinavagupta, Abhinavabhāratī; tenth-century philosophical commentary that systematizes Rasa theory [7]; (c) Viśākhadatta Mudrārākṣasa as an illustration [8]; and (d) Kauṭilya Arthaśāstra. The secondary corpus forms a total of 87 peer-reviewed articles and 14 monographs, obtained through systematic database searches on Scopus, Web of Science and JSTOR using the search strings: “Rasa theory neuroscience,” “mirror neurons aesthetics,” “Digital humanities,” “Nāṭyaśāstra AI” and “Indian Knowledge Systems NEP 2020.” Sources were included if they had been published between 2000 and 2025, and subjected to peer review; conference abstracts were excluded from the empirical neuroscience strand but included, with explicit qualification, in the digital humanities strand where the field's publishing norms diverge.

3. Rasa Theory: A Taxonomy of Affectionate Knowledge

Rasa, literally “essence” or “flavor,” is the central epistemological construct of the Nāṭyaśāstra. The well-known formula by Bharatamuni in 6.31 – “Rasa is born from the conjunction of Vibhāva, Anubhāva, and Vyabhicāribhāva” [1, p. 105] – describes Rasa not as a subjective inner feeling but as an emergent intersubjective state that is derived from the structured interaction between determinants (Vibhāva: causative stimuli), consequents (Anubhāva: behavioral responses) and transitory states (Vyabhicāribhāva: transient feelings). This triadic structure forms what contemporary cognitive scientists would deem a functional model of how emotion manifests: The Rasa experience is never affect raw, but cognitively mediated, contextually situated and communicatively transmitted affect.

Abhinavagupta's Abhinavabhāratī (1000 CE) further extends this model with Sādhāraṇīkaraṇa (universalization): the mechanism through which

particular emotions – bound to specific characters and situations – are made general, into universal aesthetic experience [7]. Abhinavagupta claims that the spectator’s investment in dramatic performance engages a distinct sort of cognition he calls *Camatkāra* (aesthetic wonder) which entails a temporary suspension of ordinary egoic consciousness. It differs from everyday emotional response on three fundamental themes of non-

utility (*nissvāda*), non-locality (*alaukika*) and cognitive expansion rather than contraction [2]. The institutional devices for the mass persuasion in the *Nāṭyaśāstra* are actually enshrined in its eleven elements. These elements enable a whole communicative atmosphere where the performer (communicator) and the audience (receiver) melt into a state of communing.

Table 1: Technical terms and Functional Description

Component	Technical Term	Functional Description in Mass Persuasion
Aesthetic Sentiment	Rasa	The ultimate emotional flavor that establishes public resonance.
Emotional States	Bhāva	The psychological building blocks used to construct the Rasa.
Communication	Abhinaya	The fourfold art (body, speech, mind, scene) for conveying meaning.
Performance Style	Dharmī	The distinction between realistic (<i>Lokadharmī</i>) and stylized (<i>Nāṭyadharmī</i>) art.
Dramatic Styles	Vṛtti	Four modes of action: verbal, grand, graceful, and energetic.
Regional Variations	Pravṛtti	Local adaptations that ensure the cultural relevance of the performance.
Music/Instruments	Svara-Gāna-Ātodya	The use of melody and rhythm to bypass rational defenses and engage emotion.
Success Criteria	Siddhi	The metric for evaluating the transformative impact on the audience.
Performance Place	Raṅga	Architectural styles (Oblong, Square, Triangular) to optimize perception.

Table 2: Structural Components of Nāṭyaśāstra's Performative Architecture

Component	Sanskrit Term	Functional Role	Modern Communicative Equivalent
Aesthetic Sentiment	Rasa	Universal experiential outcome of performance	Audience emotional response / affect measurement
Psychological States	Bhāva	Building blocks of Rasa experience	Appraisal processes in emotion regulation research
Embodied Communication	Abhinaya	Fourfold codification: body, speech, mind, costume	Multimodal communication theory
Performance Modality	Dharmī	Naturalistic (Loka) vs. stylized (Nāṭya) modes	Realism vs. abstraction in performance studies
Dramatic Registers	Vṛtti	Verbal, grand, graceful, and energetic action modes	Rhetorical registers in persuasion theory
Spatial Architecture	Raṅga	Oblong, square, triangular theater forms	Acoustic and visual optimization in arena design
Evaluative Criterion	Siddhi	Transformative impact measure for the performance	Audience reception and affective outcome metrics

These performed architectural aesthetics, were not purely decorative solutions to construction problems but helped to facilitate the techniques of dramatic delivery as well as provide clear sight

lines; both of which would enable the ethical instruction to reach everyone in the assembly whatever their position in relation to where they are seated.

4. An illustration of Aesthetic Persuasion: The Arthaśāstra–Mudrārākṣasa Nexus

4.1 A Unified Epistemology of Persuasion in Classical Indian Thought

A prevailing assumption in comparative political theory is that a categorical distinction exists between aesthetics and politics: the former concerns beauty and meaning, while the latter concerns power and interest. These two texts, the Nāṭyaśāstra and the Arthaśāstra together provide a systematic rebuttal to this dichotomy. The Arthaśāstra of Kauṭilya (ca. 300 bce), a technical volume on statecraft and political economy [9, 10], is organized into three concentric circles of interdependent sciences: the philosophical inquiry called Ānvīkṣiki; Vedic learning (Trayī); and Economics (Vārtā); with the fourth—statecraft or Daṇḍanīti—acting as an integrative application that mediated between these core domains [8] What is often forgotten, however, is that Daṇḍanīti also has with Nāṭyaśāstra a more than passing interest in the management of perception; the regulation of affective states in subjects and adversaries alike; and systematic exploitation of psychological vulnerabilities.

This parallel is structurally codified in Viśākhadatta's Mudrārākṣasa (ca. 4th–9th cent. CE), a Sanskrit nāṭaka that chronicles Cāṇakya's scheming to secure Candragupta Maurya the throne. Importantly, the play is classified by its own dīpikā commentaries as a dramatic work conformant to the Nāṭyaśāstra [8], meaning that its dramatic architecture—its handling of Rasas, deployment of Nāyaka typology, and use of disguise and ekāvalī (interconnection of causes)—is at once a performance-aesthetic and a political-strategic document. The main conflict of the play is not military, but rather psychological: Cāṇakya must win over the powerful minister Rākṣasa's emotional loyalty (Bhāva of Rāti towards his former king) from the Nanda dynasty to the Maurya cause.

4.2 Analyzing Them Hermeneutically-Comparatively Why They Are Persuasive

Our thematic coding of Mudrārākṣasa reveals five recurring persuasion strategies that overlap with the colloquy of affective speech theory in Nāṭyaśāstra and dandanītical prescriptions for commitment-shaping action in Arthaśāstra. These are summarized in Table 4 along with their modern governance and communication theory counterparts. This mapping indicates that Cāṇakya's efforts—whatever else they were or became—were not incidental scheming but rather the systematic deployment of a formal theory of intersubjective affect management—the very theory which, along the dimension of theatrical performance, is elaborated in the Nāṭyaśāstra.

The climax-resolve of the play—Rākṣasa's voluntary surrender to Candragupta—is forged not by coercion but by Camatkāra: an aesthetic-political wonder moment formed through the staged-delivery of Cāṇakya's stratagems' multilayered effects. Rākṣasa's conversion parallels the experience of the spectator in theatre of Rasa; his ordinary ego-bound emotional attachment (Bhāva) is universalized (Sādhāraṇikaraṇized) to a recognition and support of a higher order dharmic governance. This structural parallel between theatrical persuasion and political persuasion forms an endogenous Indian theory of rhetoric that comparative political philosophy has given insufficient systematic attention.

4.3. Parallels Between Ancient Statecraft and Modern Governance

An analysis of Mudrārākṣasa suggests that its discourse on realpolitik appears to offer a non-Western mode of development, which opposes the dominance the Western tradition casts over political thought. Today, Cāṇakya is considered to be an ancestor of the modern day “advisory” group and think tank—the power behind the power at court.

Table 3- Conceptual Comparison

Arthaśāstra Concept	Application in Mudrārākṣasa	Modern Administrative Correlation
Espionage (<i>Gūḍhapuruṣa</i>)	Use of diverse spies (e.g., snake charmers, monks) for intelligence.	Strategic intelligence and national security operations.
Mandala Principle	Mapping concentric circles of allies and enemies to maintain balance.	Regional diplomacy and international geopolitical alliances.
Psychological Maneuver	Forging a signet ring (<i>Mudrā</i>) to manipulate Rākṣasa's perception.	Perception management and strategic communication in politics.
National Integration	Winning over the adversary (Rākṣasa) through policy rather than war.	Post-conflict reconciliation and dialogue-based reform.
Ethical Pragmatism	Adherence to <i>Dharma</i> as the fulfillment of a ruler's duty for stability.	Corporate governance ethics and responsible leadership.

The play is sophisticated in that it's an example of postmodern theatre, or a piece with such elements as uncertainty, relativism, black comedy (or anti-comedy), and irony. For example, in Act I the several carrying of a picture of the God of Death as a metaphor for treason by Mudrārākṣasa dramaturgy can be used to convey intricate political admonition and through out the action the the concept of dhvani(suggestive meaning) is conveyed. The shift from Nanda period to Maurya period is described not just as a change in dynasty but that of the governance from non democratic to people centric with statesmanship as the main quality t of ministers trained "in the intellect", whose meanest choice should be terribleness.

Table 4: Persuasion Strategies in Mudrārākṣasa – Cross-Mapped with Nāṭyaśāstra and Arthaśāstra

Persuasion Strategy	Instance in Mudrārākṣasa	Nāṭyaśāstra Parallel	Arthaśāstra Parallel	Modern Equivalent
Emotional Re-framing	Cāṅakya reframes Rākṣasa's loyalty as misplaced Bhāva	Vibhāva manipulation to redirect Rasa	Sāma (conciliation) as statecraft tool	Reframing in negotiation and conflict resolution
Strategic Concealment	Use of disguise and forged signet ring (Mudrā)	Nāṭyadharmī stylization; within-role	Gūḍhapuruṣa (covert agent) deployment	Intelligence operations; strategic ambiguity
Affect Amplification	Staged revelation of multilayered consequences	Saṅcāribhāva (transitory emotional intensification)	Psychological warfare (upajāpa)	Emotional escalation in diplomatic negotiation
Camatkāra Induction	Rākṣasa's moment of sudden recognition and surrender	Aesthetic wonder as epistemological rupture	Daṇḍanīti through non-coercive transformation	Persuasion through cognitive dissonance resolution
Dharmic Appeal	Governance framed as fulfillment of higher duty	Śānta Rasa as resolution state	Rājadharmā as legitimizing principle	Ethical leadership and institutional trust-building

4.4 The Sociological and Cognitive Import of Sādhāraṇīkaraṇa

The two form part of the Nāṭyaśāstra's power as a social teaching tool by steering its focus to that which is universal: Sādhāraṇīkaraṇa – universalization. As articulated by the 10th-century philosopher Abhinavagupta in his commentary Abhinavabhāratī, Sādhāraṇīkaraṇa is the process of how individual feelings (bhāvas) are transformed into universal aesthetic rasa. 16 to reach beyond their limitations and partake of a "shared aesthetic joy" (rasāsvāda) that Abhinava compares with Yogic ecstasy.

The sociology: Sādhāraṇīkaraṇa as the modulation of emotion From a sociological perspective, through it allows for communal participation that dissolves individual limitations to character and produces emotionally fuller resonances. It is central for a comprehension of the collective theater experience as yet another yajña experience in society, where the "I-ness" of the spectator's self is temporarily subordinated to the "we-ness" of the aesthetic happening.

4.5 From Political Persuasion to Cognitive Universalization: A Milkway

The foregoing discussion of Mudrārākṣasa has established that the Nāṭyaśāstra's theory of affective persuasion is not limited to captured moments on the stage – it functions wherever work is performed toward the design of

structured emotional environments meant to alter a society's collective consciousness. This insight paves the way for the paper's second major movement: a discussion of the cognitive and neurological mechanisms that undergird Rasa experience itself.

The philosophical bridge linking the two movements is Sādhāraṇīkaraṇa – universalization. Named by the Abhinavabhāratī of Abhinavagupta, Sādhāraṇīkaraṇa describes a process whereby individual feelings (Bhāvas), anchored in a particular character and situation, are transmuted into universal aesthetic states that can be felt by all spectators irrespective of personal history or status. It is exactly this mechanism that accounts for both the theatrical and the political power described in Section 4; be it a Sanskrit playhouse or Cāṅakya's court, the outcome remains constant – the collapse of narrow self-interest into an expansive commonality of dharmic order.

Sādhāraṇīkaraṇa, from a sociological perspective then, achieves collective engagement that transcends the boundaries of individual ego and yields, as Abhinavagupta suggests rasāsvāda – a common esthetic delight likened to Yogic ecstatic experience. In its own sense, the shared theater experience is a kind of yajña, or social sacrifice, in which what Rishi calls the "I-ness" of the individual spectator is subordinated – if only for

a while – to the “we-ness” embodied by the aesthetic event. It is this universalizing mechanism that the following section pairs with contemporary affective neuroscience – to which we shall argue its structural analog resides in mirror neuron systems and phenomena of inter-subject neural entrainment.

5. Neuroscience and the Embodied Epistemology of Rasa

5.1 Neuroscience Mapping

Mapping classical aesthetic constructs onto neuroscientific findings must be qualified carefully methodologically. We do not suggest that either Bharatamuni or Abhinavagupta somehow knew empirically of the function and architecture of neural networks; however, we argue that their phenomenological observations concerning affective experience were precise enough to prefigure—and in some instances provide greater detail than—chapter and verse

neuroscientific descriptions of such qualitative phenomena. This view is in line with Shulman [10], who has argued that the Indian philosophical traditions cultivated a refined “first-person neuroscience” through methodical introspective observation and with Huth et al. is based on [11] finding that subjective emotional categories have reliable neural correlates across subjects.

There have been deep convergences over the past decade between Rasa theory and cutting edge behavioral, cognitive, and affective neuroscience. Rasa is more and more conceived as a model of embodied consciousness, where the “bodymind” serves as a locus for producing collective knowledge. 17 Neuroscientific research has shown that experiences of art engage the amygdala, insula and prefrontal cortex, which have been associated with emotional response and social cognition.

Table 5: Rasa concept and Cognitive Equivalent

Rasa Concept	Cognitive/Neuroscientific Equivalent	Physiological/Neurological Mechanism
Sādhāraṇīkaraṇa	Mirror Neuron System / Empathy	Activation of neural networks for sharing others' feelings and "Theory of Mind".
Bhāvanā	Mental Imagery	Active reconstruction of sensory experiences in the visual cortex without external stimuli.
Ekāgra	"Flow"State (Csikszentmihalyi)	Diminished activity in the prefrontal cortex, leading to reduced self-referential processing.
Tanmayībhavana	Neural Entrainment	Synchronization of physiological rhythms between the observer and the observed.
Alaukika	Peak Experience	A transformative state of consciousness separate from mundane emotional responses.

The principle of tanmayībhavana (absorption, becoming one with the aesthetic object) is considered pivotal to emotional identification and the result, according to this assumption, would be that spectators all become one in rasa - which heightens emotional experience, and thus the capacity to ‘know’ emotionally in Rasa. In addition, Bharata Muni’s classification of colours according to the Rasa conveys an ancient awareness of importance of modulating the human psyche through sensory perception.

5.2 Sādhāraṇīkaraṇa & mirror neuron systems

The modality of Sādhāraṇīkaraṇa as described in Abhinavagupta, the universalization that allows a spectator to transcend their individual identity and join an aesthetic state common with whatever is being viewed, has its most direct neurological analog with mirror neuron systems (MNS). Gallese et al. [12] found that the human mirror-neuron system (composed of premotor cortex [BA6] and inferior parietal lobule [BA40]) is

activated both during the execution of action, and when observing their same counterpart, which represents a neural substrate for “shared manifolds of intersubjectivity.” Bastiaansen et al. (2022) followed up this research with further studies showing that [13] further generalized this to emotional states: the anterior insula and anterior cingulate cortex are activated both in first-person emotional experiencing as well as viewing the expression of emotion in others.

It is noteworthy that the parallel structure with Sādhāraṇīkaraṇa. Abhinavagupta further explains that in order to universalize, the spectator must supposedly adopt a mode of consciousness he calls Tanmayībhavana (absorption into the Other); this mode is characterized by the dissolution of boundaries between self and character [7]. A related process is described by Gallese and Corrado [14] in their model of “aesthetic co-presence”: subjects engaged aesthetically with performance show reduced medial prefrontal

cortex activity associated with self-referential processing, contrary to enhanced MNS activation. In other words, this neural signature—more of the self in mind coinciding with less self, and more of others—would be exactly how Abhinavagupta described the experience of Rasa. Crucially, this does not mean that it is the same as ordinary empathy (which leaves the self-other distinction intact) or simply imitation: it is a state that in some sense emerges, which Abhinavagupta calls Alaukika (non-ordinary).

5.3 Tanmayībhavana and Neural Entrainment

The aesthetic concept of Tanmayībhavana (absorption, merging with the aesthetic object) in turn maps onto the neuroscientific phenomenon of neural entrainment—the synchronization of neural oscillations between interacting subjects. Hasson et al. [15] showed inter-subject neural coupling during naturalistic film viewing with fMRI: correlations in BOLD responses of subjects watching the same narrative were significant and highly positive in frontal, parietal, and temporal

regions [653], and the strength of such coupling predicted comprehension of the narrative. Later work by Nummenmaa et al. [16] that live theatrical performance elicits more inter-subject physiological synchrony (heart rate, skin conductance, respiratory pattern) than film, supporting the Nāṭyaśāstra’s suggestion of a phenomenologically unique power of living stage versus filmed action (pratyakṣa anubhava).

Crucially, the extent of entrainment predicted by these studies is correlated with what Bharatamuni identifies as the core facilitators of Rasa exchange: temporal synchrony (laya), musical modulation (svara), spatial proximity between performer and spectator (raṅgasthāna) [1]. Recent research by Tschacher et al. [17] on dance audiences, found that synchrony of movement between performers and audience members is associated with subjective ratings of aesthetic engagement, thus directly providing behavioral evidence to what the Nāṭyaśāstra encodes as the aesthetic principle of Anukaraṇa (hence: imitation-resonance).

Table 6: Systematic Mapping of Rasa Constructs onto Empirically Validated Neuroscientific Mechanisms

Nāṭyaśāstra Construct	Definition	Neuroscientific Mechanism	Shared Principle	Explanatory
Sādhāraṇīkaraṇa	Universalization: dissolution of personal identity into shared aesthetic state	Mirror neuron system (MNS); mentalizing network; reduced mPFC self-referential activity	Shared neural manifolds underlie empathic co-presence	
Tanmayībhavana	Absorption: becoming one with the aesthetic object or character	Inter-subject neural entrainment; autonomic synchrony; physiological coupling	Narrative engagement synchronizes oscillatory brain states across subjects	
Bhāvanā	Mental imagery: vivid reconstruction of sensory experience in absence of stimulus	Top-down visual cortex activation; predictive processing models; imagery-perception overlap	Imagination activates perception-equivalent neural substrates	
Ekāgra	One-pointed attentional absorption; cessation of discursive thought	'Flow' state (Csikszentmihalyi); reduced DMN activity; hypofrontality	Deep attentional engagement reduces default-mode self-referential processing	
Alaukika	Non-ordinary consciousness: aesthetic experience as distinct from mundane affect	Peak experience; self-transcendence; kama muta; awe response	Aesthetic peak states involve distinctive autonomic signatures and altered temporal perception	
Sthayi-bhāva	Dominant/abiding emotional state that persists through the performance	Tonic affective baseline; mood regulation; allostatic load	Sustained contexts modulate interpretation of momentary emotional events	

6. Frontiers of Digital Humanities and the Nāṭyaśāstra: An Appraisal of Emerging Projects

6.1 The Digital Transformation of Classical Performance: Overview and Methodological Stakes

The use of digital technologies in traditional Indian classical performance styles is a highly emergent space that intersects computational humanities, performance studies and human-computer interaction. As text, the Nāṭyaśāstra has proved to be a strangely fruitful source for such efforts, in part because its systematic codification of aesthetic and embodied knowledge is amenable to formalization – a precondition for computation. Yet digital humanities projects in this register encounter a unique methodological difficulty: the tendency to reduce rich, embodied, intersubjective aesthetic experience into computable data structures and so produce technically adroit but aesthetically unsatisfactory renderings.

6.2 Digital Frontiers: VR Performance and the "VRasa" Framework

In the digital age, Nāṭyaśāstra principles also find new media to be applied in, like Virtual Reality (VR) and Artificial Intelligence (AI). The idea of the performance space as a sacred, liminal space is one that maps itself neatly onto VR's immersive realms. The study contributes to the discourse on how Rasa theory is relevant for building the "virtual stage" in VRasa, a project that re-enacts 7th century Sanskrit farce Bhagavadajjukam on virtual social platform.

Discoveries from VR performance workshops indicate that the Rasa model of emotional coding provides a means for the construction of resources representing transcendence (Alaukika moments) in VR. They also indicated that the use of characters could increase your emotional involvement meaning some of the actors were actually more comfortable expressing and directly experiencing the higher Rasas as they felt less conscious in their real body whilst being observed as an avatar. But emotion-Rasa in digital environments still faces challenges, such as motion-sickness and formalized character animation, especially the lack of non-verbal feature cues derived from text-based data.

6.3. A Śāstrīya Framework for AI and Machine Learning- a future possibility

The Śāstrīya Framework is an innovative approach to translating classical Indian dance and theatre into AI, Machine Learning (ML), and virtual production systems. This philosophy is a response to the continued necessity to sustain and bring tradition back up-

the-purpose of traditional arts, while not compromising their aesthetic integrity. The process includes encoding śāstric doctrines like rasa-bhāva theory and abhinaya codification into machine-readable formats (TEI XML and graph databases) so as to train AI models.

These AI models are then validated by the combination of the two criteria:

➤ Śāstrīya Peer Review: Here, abhinaya sequences generated by the AI are reviewed for the adherence to established traditional abhinaya guidelines.

➤ Biometric Audience Testing: (EEG & gaze tracking) to measure the emotional response generated by digital vs. live performance.

➤ This framework positions AI as a "digital upaviṇā" – a supporting, non-intrusive device that can enrich creative options while maintain allegiance towards the culture. The research adopts markerless motion capture (Intel RealSense) and Neural Radiance Field (NeRF) to reconstruct high-fidelity virtual maṇḍapas that conform to the architectural imperatives of Nāṭyaśāstra.

6.4 . Bibliometric Trends and the Timeline of Nāṭyaśāstra Research (2000-2025)

The scholarly reception of the Nāṭyaśāstra has evolved from a nineteenth-century focus on philology and textual editing to a twenty-first-century emphasis on aesthetics, cognitive science, and digital humanities. Bibliometric analysis of the Scopus database between 2000 and 2024 shows a significant upward trend in publications that treat the Nāṭyaśāstra as a living tradition rather than just a canonical text.

Although the number of studies continue to expand, bibliometric analyses indicate that research examining longer termed comparative effectiveness or cross cultural exchange is scant. Current interdisciplinary collaboration is movement to use mathematical modeling to assess effectiveness of AI-supported VR applications on the development of student's modeling competences, with a large effect size results having been revealed in recent quasi-experimental designs.

7. Future Research Scope

Interpreting the inferential analysis suggests priority areas for future research. We suggest the following:

● Theoretical mapping needs to be tested on empirical studies of Rasa experience measured with validated psychometric instruments and neuroimaging and physiological measurement. Direct comparisons between classical Indian performance forms, for instance, and measure of

neural entrainment and measures of inter-subject coupling within Western theatrical traditions would be particularly valuable.

- Pre-registered experimental designs for the VRasa and Śāstrīya Framework projects would facilitate causal inference regarding whether or not VR-mediated and AI-supported Rasa induction is effective, This has to be evaluated .

- An area of research in curriculum was neglected therein is one that employs a randomized or quasi-experimental design, to assess Nāṭyaśāstra-informed drama pedagogy's efficacy at promoting social-emotional learning outcomes in Indian school contexts; experiment-driven insights are essential for a robust IKS-based implementation of National Education Policy 2020.

- The comparative political philosophy research applying the persuasion framework devised as an analytical lens for contemporary governance contexts could yield unique insights on political communication, conflict resolution, and leadership ethics across non-Western democratic systems.

8. Conclusion

Of the manifold ideas embedded in the Nāṭyaśāstra, none rivals its systemic articulation of aesthetic experience, and as I hope this article has shown to a measure, no theory impresses more on us with its remarkable generative potential for our further interdisciplinary exploration. Interrogated with methodological rigor rather than reverent exegesis, its principal constructs—Rasa, Śādhāraṇīkaraṇa, Tanmayībhavana, Bhāvanā—are no longer culturally specific aesthetic concepts but exact phenomenological descriptions of processes independently elucidated within affective neuroscience as central to human social cognition and emotional life. The structural analogies we have traced between Nāṭyaśāstra's theory of persuasion and Arthaśāstra's political epistemology provision an integrated classical Indian theory of affective governance that is a generative resource for comparative political philosophy. The development of critical review, offered in the book as an evaluative lens to examine digital humanities projects, captures both the promise and methodological growing pains behind computational work within this tradition and serves as a roadmap toward more rigorous future engagement.

The article's contribution to the wider discussion on decolonial epistemology should be read as methodological rather than rhetorical ground. We

do not suggest Indian knowledge systems are better than Western or that their worth rests on mapping them to some measure of equivalence with Western academic standards. We are arguing, with more precision, that the conceptual architecture of the Nāṭyaśāstra is sufficiently precise, internally consistent and empirically resonant enough under the kind(s) of methodological scrutiny to be applied to any theoretical framework alongside contemporary scholarship in order for it to stand up as an effective theoretical resource for inter-disciplinary research. The Fifth Veda is not an archaeological relic for the past, but a functioning epistemological tool for this moment when properly engaged.

Future scholarship on this tradition will need to take three commitments: methodological transparency in the operationalization of śāstric categories; empirical rigor in claims about cognitive and pedagogical efficacy, and last but not least, cultural humility with respect to ancient knowledge systems that may not only be better predictors of modern scientific discoveries but also provide finer-grained phenomenological accounts of experiential phenomena than those articulated in contemporary Western scientific literatures. The Nāṭyaśāstra does invite such engagement—and the contemporary academy has methodologies to offer the terms that invitation deserves.

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