Deleuze-Driven Identity-Illusion Semantics (v4): Axioms, Discriminants, and Groupoid-Orbit Forms

Abstract

We formalize a Deleuze-aligned semantic layer that integrates with a pullback-based structural core. Observations pass through a form selector and an identity-illusion projection

$$\Phi_\kappa = q_\kappa \circ \rho \circ \mathrm{Obs}_\star : X \to I_\kappa,$$

inducing a difference triad: the kernel flow $\mathcal{V} := \ker d\Phi_\kappa$, the automorphism groupoid $\mathrm{Aut}_{\Phi_\kappa}$, and the discriminant $\mathrm{Disc}(\Phi_\kappa)$. We upgrade $\mathrm{Aut}_{\Phi_\kappa}$ to an étale groupoid of local Φ_κ-preserving diffeomorphisms and construct the space of repeated forms $\mathcal{R}$ as a groupoid-orbit stratification; a jet-augmented normal form provides auditable boundary types. On a regularity hypothesis we prove: invariance laws, a short exact sequence $0 \to \mathcal{V} \to TX \xrightarrow{d\Phi_\kappa} \Phi_\kappa^*(TI_\kappa) \to 0$, a Lie correspondence, and a dynamic normal form (displacement $\circ$ masquerade $\circ$ displacement). An event-visible time layer and a profunctor halo support concurrency and soft alignment.

1 Motivation and Positioning

We treat language-level distinctions as saturated and require a single, disciplined semantic device that is audit-friendly, composable with a structural pullback core, and robust to small deformations. Deleuzian vocabulary (difference, repetition, series, deterritorialization) is operationalized as testable invariances and boundary transitions.

Contributions. (i) Axioms and hypotheses for a Deleuze-aligned semantic pipeline with explicit public gates. (ii) Discriminant calculus separating mechanism, appearance, and semantic jumps. (iii) Groupoid-orbit construction of repeated forms, with jet-augmentation for boundary audit. (iv) Regular-region theorems (invariance, exactness, Lie correspondence, dynamic normal form). (v) Interfaces to the pullback alignment core and an event-visible extension.

Structure of the Note. Section 2 fixes notation and the main hypotheses. Section 3 states axioms. Section 4 defines the semantic pipeline, discriminant, and forms. Section 5 proves the regular-region theorems. Section 6 sketches the time/event extension. Section 7 specifies the interface to the pullback core.

2 Notation and Hypotheses

Let $X = \Delta_{\text{gen}}$ be the generated difference space. Fix a readable gate $U_\star \subseteq X$ and an observation map $\text{Obs}_\star : U_\star \to \delta_\star$ with a public test family $T_\star$ (calibration, thresholds, time windows, sampling law). Let $\rho : \delta_\star \to \mathcal{R}$ be a least-form selector; let $q_\kappa : \mathcal{R} \to I_\kappa$ be the identity-criterion projection ($\kappa \in \{\text{identity, similarity, analogy, negation}\}$). Set $\Phi_\kappa = q_\kappa \circ \rho \circ \text{Obs}_\star : X \to I_\kappa$. Write $\Sigma \subset I_\kappa$ for appearance singularities and $I_\kappa^{\text{reg}} = I_\kappa \setminus \Sigma$. Let $\nu : I_\kappa^{\text{reg}} \to \mathcal{R}$ be the type map; define $\mathcal{V} = \ker d\Phi_\kappa \subset TX$.

Regularity hypothesis (H_{reg})**.** On $X \setminus \text{Disc}(\Phi_\kappa)$ the differential $d\Phi_\kappa$ has locally constant rank; ρ is locally constant; ν is locally constant along Φ_κ-fibres.

3 Axioms (operational Deleuze)

T (Time–Repetition) Every time-identification concerns repetition; boundaries lie between repeated forms.

D (Difference–Force) Repetition manifests and regenerates difference; displacement and masquerade regenerate bifurcations and decentering.

ER (Selective Return as Operator) There exists a return operator $\mathfrak{R}$ on forms such that fixed points of $\mathfrak{R}$ are precisely difference-affirming forms; labels like "identical/similar/analog/negative" are pragmatic names that apply only after return.

S (Singularity–Series) Differences communicate through series and differences of differences; temporal allocation confers selective power to $\mathfrak{R}$.

L (Pragmatic Legality) Public names for sameness are permitted only as post-return pragmatic effects governed by tests in $T_\star$.

4 Pipeline, Discriminant, and Forms

Definition 4.1 (Observation-to-Projection)**.** *The semantic pipeline is*

$$X \xrightarrow{\text{Obs}_\star} \delta_\star \xrightarrow{\rho} \mathcal{R} \xrightarrow{q_\kappa} I_\kappa, \qquad \Phi_\kappa := q_\kappa \circ \rho \circ \text{Obs}_\star.$$

It induces $x \sim_\kappa y \iff \Phi_\kappa(x) = \Phi_\kappa(y)$. When Φ_κ is surjective, $X/{\sim_\kappa} \cong I_\kappa$, with differences retained in fibres.

Definition 4.2 (Discriminant calculus)**.** *The discriminant is the union*

$$\text{Disc}(\Phi_\kappa) = \underbrace{\text{Crit}(\Phi_\kappa)}_{\textit{mechanism: rank drop}} \quad \cup \quad \underbrace{\Phi_\kappa^{-1}(\Sigma)}_{\textit{appearance: image-side folds}} \quad \cup \quad \underbrace{J(\rho \circ \text{Obs}_\star)}_{\textit{semantic jump: threshold/class change}} .$$

On $X \setminus \text{Disc}(\Phi_\kappa)$ the map Φ_κ is a submersion and ν is locally constant.

Definition 4.3 (Automorphism groupoid and repeated forms). *Let* $\mathrm{Aut}_{\Phi_\kappa}$ *be the étale groupoid of local diffeomorphisms preserving* Φ_κ. *Let* $\mathcal{P}$ *be the pseudogroup generated by local flows of vector fields in* $\Gamma(\ker d\Phi_\kappa)$ *and arrows of* $\mathrm{Aut}_{\Phi_\kappa}$*, acting on* $\delta_\star$. *Define an equivalence* $z \sim z' \iff \exists h \in \mathcal{P} : \; z' = h \cdot z$. *Set* $\mathcal{R} := \delta_\star/\sim$. *A jet-augmented representative is* $r = \Big(\mathrm{nf}(z), [\mathrm{Iso}(z)], \mathbf{j}_z\Big)$*, where* $\mathrm{Iso}(z)$ *is the stabilizer class and* $\mathbf{j}_z$ *is a finite germ/jet along* Disc *for auditable boundary types.*

Definition 4.4 (Dynamics: displacement, masquerade, bifurcation). *Displacements are flows tangent to* $\mathcal{V} = \ker d\Phi_\kappa$. *Masquerades are paths in* $\mathrm{Aut}_{\Phi_\kappa}$. *Bifurcations (deterritorializations) are transverse crossings of* $\mathrm{Disc}(\Phi_\kappa)$ *that change* ν *from* r_i *to* r_j.

Definition 4.5 (Auditable boundaries). *Pairs* (r_i, r_j) *form a semantic boundary when closures of* $\nu^{-1}(r_i)$ *and* $\nu^{-1}(r_j)$ *meet along* $\mathrm{Disc}(\Phi_\kappa)$. *A boundary witness is a curve* γ *with* $\gamma \pitchfork \mathrm{Disc}$ *and a jet-type change* $\mathbf{j}_- \to \mathbf{j}_+$.

5 Regular-Region Theorems

Theorem 5.1 (Invariance laws). *For any* $g \in \mathrm{Aut}_{\Phi_\kappa}$ *and* $x \in X$,

$$dg_x\Big(\ker d\Phi_\kappa(x)\Big) = \ker d\Phi_\kappa\Big(g(x)\Big).$$

Hence $g_*\mathcal{V} = \mathcal{V}$*, and* g *maps discriminant components to discriminant components.*

Proposition 5.1 (Exactness at regular points). *Under* (H_{reg}) *there is a short exact sequence of vector bundles*

$$0 \longrightarrow \mathcal{V} \longrightarrow TX \xrightarrow{d\Phi_\kappa} \Phi_\kappa^*(TI_\kappa) \longrightarrow 0,$$

and $\mathcal{V}_x = T_x\Big(\Phi_\kappa^{-1}(\Phi_\kappa(x))\Big)$.

Theorem 5.2 (Lie correspondence on the identity component). *Let* $\Gamma(\mathcal{V}) = \{V \in \mathfrak{X}(X) : d\Phi_\kappa \circ V = 0\}$. *If* V *integrates, its local flow* ψ_t *preserves* Φ_κ. *Conversely, a path* $g_t \in \mathrm{Aut}_{\Phi_\kappa}$ *with* $g_0 = \mathrm{id}$ *has generator* $V \in \Gamma(\mathcal{V})$. *Thus* $\mathrm{Lie}\Big(\mathrm{Aut}^0_{\Phi_\kappa}\Big) \cong \Gamma(\mathcal{V})$.

Theorem 5.3 (Dynamic normal form (regular region)). *Any local* Φ_κ*-preserving evolution factors as*

$$\textit{displacement} \circ \textit{masquerade} \circ \textit{displacement.}$$

Near Σ*, bifurcation moves must be admitted.*

Remark 5.1 (Singular window (exception rule)). *At* $\mathrm{Disc}(\Phi_\kappa)$*, the dimension of* $\mathcal{V}$ *may jump; vertical flows may fail to preserve* Φ_κ *globally. Results above apply on regular open sets; singular cases require additional conditions (e.g. semialgebraic stratifications).*

6 Time and Event-Visible Extension

Let T be a time object (e.g. $(\mathbb{R}, +)$ or $(\mathbb{Z}, +)$). A motion is $x : J \to X$ with projected motion $\Phi_\kappa \circ x : J \to I_\kappa$. To support concurrency, enrich the bridging theory with replayable traces and time, and require switching laws to commute with composition.

7 Interface to Pullback Alignment

Let $\mathcal{A}_{\min}$ be the minimal bridging theory equipped with decidable predicates Pre, Post, Err, Win. Fix a semantics functor $S : \mathcal{A}_{\min} \to \delta_\star$ that preserves the public test family $T_\star$. For an object (X, A, θ) in the pullback alignment space $\mathcal{P} = \mathcal{C}_W \times_{\mathcal{A}_{\min}} \mathcal{D}_W$, *semantic compatibility* holds when

$$\rho(S \circ F(X)) = \rho(S \circ G(A)), \qquad \Phi_\kappa(S \circ F(X)) = \Phi_\kappa(S \circ G(A))$$

on a regular neighborhood in I_κ^{reg}. Semantic boundaries are detected by discriminant crossings that switch ν.

Minimal Audit Ledger (for this layer)

Gate $U_\star$ and tests $T_\star$; ρ, q_κ, Φ_κ; discriminant report; groupoid data (arrows, isotropy classes); jet-augmented form representatives; regularity domain; boundary witnesses (curves and jet-type transitions).