Core Emotion Framework (CEF): Technical Specification 5 (TS-5)

Interoperability & Cross-System Integration
Canonical Architecture-Level Technical Document
Version 1.0 — Zenodo-Ready

Author: Jamel Bulgaria
ORCID: 0009-0007-5269-5739
Affiliation: OptimizeYourCapabilities.com
Contact: admin@optimizeyourcapabilities.com
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Abstract

The Core Emotion Framework (CEF) Technical Specification 5 (TS-5) defines the canonical interoperability architecture for integrating the CEF with external psychological models, computational ontologies, multimodal data systems, and cross-framework taxonomies. Whereas TS-1 through TS-4 specify the internal mechanics, validation logic, computational structures, and simulation protocols of the CEF, TS-5 establishes the formal rules, constraints, and translation principles governing all cross-system mappings.

TS-5 is an architecture-level document. It does not include applied examples, clinical interpretations, or modality-specific reframes. Instead, it defines the structural logic that ensures identity preservation, directionality integrity, and boundary coherence when the CEF is interfaced with external systems.

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1. Purpose and Scope

1.1 Purpose

TS-5 establishes the canonical interoperability architecture of the CEF. It defines:

- cross-system mapping rules
- equivalence constraints
- translation principles
- interoperability boundaries
- identity-preservation requirements
- cross-framework alignment logic
- multimodal data integration rules
- ontology-level compatibility conditions

1.2 Scope

TS-5 defines:

- interoperability constraints
- mapping functions
- equivalence classes
- translation matrices
- cross-ontology alignment rules
- multimodal data integration architecture

TS-5 does **not** include:

- clinical examples
- applied reframes
- psychotherapy modality descriptions
- implementation code
- software engineering patterns

TS-5 is subordinate to TS-1 through TS-4 and must be interpreted in accordance with their definitions and constraints.

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2. Interoperability Architecture Overview

2.1 Interoperability Domains

CEF interoperability occurs across four domains:

1. **Psychological Frameworks**
2. **Computational Ontologies**
3. **Multimodal Data Systems**
4. **Cross-Framework Taxonomies**

2.2 Interoperability Principles

Interoperability must satisfy:

- **Identity Preservation**
- **Structural Integrity**
- **Directionality Fidelity**
- **Non-Collapse**
- **Non-Expansion**

- **Bidirectional Transparency**
- **Non-Circularity**

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3. Mapping Architecture

3.1 Mapping Functions

Let **CEF** be the canonical architecture and **X** an external system.

A mapping function is defined as:

$M: CEF \rightarrow X$

Mappings must be:

- injective
- reversible
- boundary-preserving

3.2 Equivalence Classes

Mappings must define:

- operator-level equivalence
- process-level equivalence
- center-level equivalence
- directionality-level equivalence

3.3 Translation Matrices

Translation matrices must satisfy:

- non-negativity
- structural boundaries
- identity preservation
- zero entries for invalid mappings

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4. Identity Preservation Requirements

4.1 Operator Identity

Operators must remain distinct under all mappings.

Forbidden:

- merging operators
- splitting operators

- redefining operators using external constructs

4.2 Center Boundaries

Centers must remain intact.

Forbidden:

- relocating operators
- collapsing centers
- redefining centers

4.3 Directionality Integrity

Directionality pathways must remain canonical.

Forbidden:

- adding edges
- removing edges
- reversing edges

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5. Cross-Framework Integration Rules

5.1 Psychological Models

Mappings must:

- preserve operator identity
- maintain center boundaries
- avoid interpretive drift
- avoid semantic substitution

5.2 Dimensional Models

Dimensional axes may modulate activation but may not redefine operators.

5.3 Personality Models

Traits must be treated as emergent patterns, not operator-level constructs.

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6. Computational Interoperability

6.1 Ontology Alignment

CEF constructs must map to external ontologies using:

- unique identifiers
- reversible mappings

- structural constraints

6.2 Knowledge Graph Integration

CEF nodes must:

- retain identity
- maintain center affiliation
- preserve directionality edges

6.3 Agent Architecture Integration

CEF may be embedded as:

- internal state vectors
- regulatory modules
- activation matrices

But must not be:

- reinterpreted as reward functions
- collapsed into fewer states

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7. Multimodal Data Integration

7.1 Data Streams

CEF may integrate:

- physiological data
- behavioral data
- linguistic data
- environmental data

7.2 Mapping Constraints

Data may modulate activation but may not:

- redefine operators
- introduce new operators
- alter directionality

7.3 Fusion and Overflow Detection

External data may support detection but cannot redefine:

- fusion
- chronic fusion

- overflow

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8. Interoperability Boundary Conditions

8.1 Forbidden Mappings

Forbidden:

- operator merging
- operator splitting
- center redefinition
- directionality modification
- semantic reinterpretation
- cross-center operator migration

8.2 Permissible Mappings

Permissible:

- functional equivalence
- modulation mapping
- dimensional overlays
- cross-ontology alignment

8.3 Structural Violations

Any mapping that violates identity, boundaries, or directionality is non-canonical.

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9. Reversibility and Transparency

9.1 Reversibility Requirement

All mappings must satisfy:

$M^{-1}(M(O)) = O$

9.2 Transparency Requirement

Mappings must include:

- mapping function
- equivalence class
- translation matrix
- boundary conditions

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10. Canonical Status

TS-5 is the authoritative interoperability specification of the CEF.
It is subordinate to TS-1 through TS-4 and defines the structural rules for all cross-system integrations.

Versioning and Revision History

- **Version:** 1.0 (Zenodo-Ready)
- **Date:** 2025-12-30
- **Revision History:** Future revisions will be documented through Zenodo DOI versioning.

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