Inference Function Evolution Under Aggregated Feedback

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What Function Evolution Specifies

The architecture treats inference functions as governance-credentialed adaptation artifacts. Each function has an authoring authority, a declared scope, declared verification record, and a credentialing chain that supports its admission.

When an authority publishes a new inference function (or a parameter update to an existing function), the publication propagates through the mesh as a credentialed observation. Consuming systems admit the new function under sandbox certification (using the same sandbox-pre-activation mechanism as runtime adaptation artifacts) before activation.

Why Function Evolution Needs Architectural Support

Inference functions in current systems are typically frozen at deployment time. Updates require deployment cycles measured in months. Adversarial co-evolution operates at much faster timescales, particularly in defense and security contexts.

Architectural support for function evolution compresses the timeline. The credentialing-and-mesh-distribution mechanism that handles other governance

updates handles inference function updates the same way. The compression is structural rather than operational.

How Sandbox Admission Composes With Function Evolution

A new function published by its authoring authority enters the consumer's deployment under sandbox-pre-activation certification. The sandbox runs the new function on representative inference patterns; the consumer's admissibility evaluator compares the sandbox's behavior to expected criteria; if the function admits, the consumer's signature certifies it for activation.

Once activated, the function operates under verification feedback. Verification observations against the function accumulate; the authoring authority observes the verification record; subsequent function updates respond to observed inference accuracy.

What This Enables for Continuous Evolution

The architecture supports continuous inference-function evolution at the operating tempo of the threat environment. Adversaries that adapt face inference functions that adapt back; the structural property is maintained even when adversarial sophistication grows.

Defense and security operations gain the structural foundation that current threat-response architectures handle through ad-hoc retraining and re-deployment. The patent positions the primitive at the layer where adversarial-aware inference operates structurally.