

Intent-Bound Surgical Procedure Execution

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What This Application Specifies

Surgeon intent enters the architecture as a credentialed declaration: intended procedure, intended approach, intended sub-phase boundaries, intended escalation profile (when to halt for surgeon review). The intent admits through composite admissibility before authorizing procedure actuators.

Intent authority composition structures map to surgical reality: surgeon-of-record authority for procedure intent, hospital authority for institutional intent (case-eligibility, equipment-status), regulatory authority for device-class intent (per-device labeling and indications). The architecture supports the multi-authority intent reality of surgical practice.

Why It Matters Operationally

Current surgical-robotic autonomy faces a structural intent gap. Surgeons configure systems that operate semi-autonomously; the relationship between surgeon intent and system behavior is implementation-dependent.

Intent-bound execution produces structural support. The intent is declared; admissibility evaluates against intent; execution proceeds within intent scope; deviations from intent fail admissibility structurally.

How It Composes With the Domain

Each procedure actuation admits against the active surgeon intent. Cross-modality observations admit against intent context. Stage-gated commitment proceeds within intent scope. Post-phase assessment compares intent against outcome.

Surgeon takeover gains structural support. When surgeon intent shifts (escalation, alternative-approach, halt-for-review), the architecture admits the intent transition; subsequent actuations admit against the new intent. Audit reconstruction traverses intent transitions structurally.

What This Enables

Surgical-robotic autonomy gains structurally-supported surgeon-of-record authority. Patient-safety outcomes gain audit-grade intent reconstruction. Regulatory frameworks (FDA, EMA) gain structurally-supported intent governance.

The architecture also supports surgical evolution. As autonomous-surgical procedures mature, as new procedure classes admit autonomy, as new intent-formulation tools emerge, the architecture admits the changes through declared specification.