

Discovery-Driven Sensor Invocation Closed Loop

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What Discovery-Driven Sensor Invocation Specifies

A discovery query (find observations matching specific criteria within a spatial-temporal window) may produce insufficient evidence to satisfy the consumer's confidence threshold. Conventional discovery responds with the partial result and lets the consumer decide what to do; the architectural primitive responds with the partial result plus a credentialed sensor-invocation observation: a request that available sensors retask to address the evidence gap.

The invocation propagates through the mesh as a credentialed observation. Sensors within range of the relevant spatial-temporal window evaluate the request through their own admissibility framework. Capable sensors that can contribute respond with credentialed observations; the discovery query re-runs against the augmented evidence base.

Why Passive Discovery Misses Available Capability

Passive discovery assumes that all relevant observations have already been produced and stored. The pattern works for stable-environment use cases (search the database

for what's there); it doesn't fit dynamic-environment use cases where sensors could produce additional observations on demand.

The structural gap matters operationally. A search for a missing person could be enriched by directing nearby cameras to scan; a search for an environmental anomaly could be enriched by directing nearby spectrum monitors; a search for an industrial-safety incident could be enriched by directing nearby thermal sensors. The capability exists; the architecture for invoking it through discovery has been absent.

How the Closed Loop Composes With Discovery

The architectural primitive extends discovery from query-and-respond to query-respond-invoke-augment. The discovery query runs against the existing evidence base; the response includes both the partial result and the invocation request; sensors that respond contribute credentialed observations; the discovery re-runs against the augmented base.

Each sensor's response is gated by its own admissibility evaluation. The sensor's admission of the invocation depends on the requesting authority's standing, the sensor's capability and current operational state, and the sensor's policy regarding sensor-invocation participation. Cross-authority invocation operates through credentialed cross-recognition.

What This Enables for Active Discovery

Search-and-rescue operations gain structural coordination across cooperating sensors. Industrial-incident response gains coordinated perception across the response area. Environmental monitoring gains active observation augmentation in regions with detected anomalies.

Defense ISR gains the same architectural foundation. Coordinated multi-sensor observation under credentialed invocation supports the operations that current per-

sensor tasking handles ad-hoc. The patent positions the primitive at the layer where discovery evolves from passive query into active coordination.