



# Kannupriya Kalra

Scala Center





Google Summer Of Code Mentor Summit 2025



LLM4S x GSoC 2025:

# ENGINEERING GENAI AGENTS IN FUNCTIONAL SCALA

Thursday, October 23 - Saturday, October 25th

@Munich Marriott Hotel, Hosted by Google,  
Germany 🇩🇪 ( live in person! )



*Kannupriya Kalra*



# The Key Outcome: Traceability Unlocked

- **Tracing Support (PR #77, #119):** Added execution flow tracking, spans, and timing. Integrated **Langfuse** for developer-friendly traces.
- **Type-Safe Tracing (PR #165):** Rebuilt with **sealed traits & composable backends**. Ensured reliability and backward compatibility.
- **Demo & Multi-Backend (PR #184):** Built a calculator agent for sequential tool-use. Showcased tracing with Console, Langfuse, and NoOp.



**Shubham Vishwakarma**

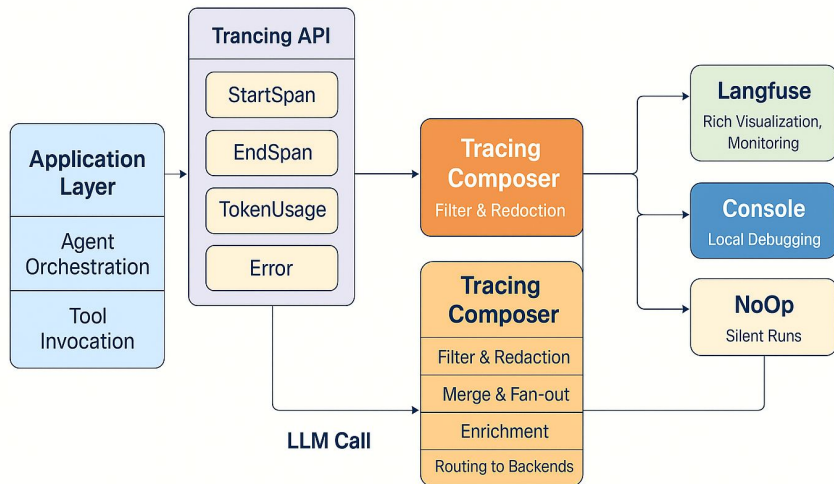
Total PRs Raised	PRs Closed / Merged	PRs Still Open
20	18	2

# How It Works: The Architectural Clarity

## LLM4S Tracing Architecture - High-Level Detailed View:

- **Diagram Flow:** Application Layer (Agent Orchestration/Tool Invocation) → Tracing API (StartSpan, EndSpan, TokenUsage, Error) → Tracing Composer → Backends (Langfuse, Console, NoOp)
- **Tracing Composer functions:** Filter & Redaction, Merge & Fan-out, Enrichment, Routing to Backends.

## LLM4S Tracing Architecture – High-Level Detailed View



# The Foundation for Future AI Systems

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## Beyond Tracing: The Next Chapter for LLM4S:

- **Multi-Agent Systems In Progress:** DAG-based planner, Pub-sub signals, Scala-native, type-safe orchestration.
- **A Real Use Case: Meeting Minutes Generator**  
**Planned** → Full traceability → every step tracked with spans/events.



**LLM4S Project Link**