Aim5B:
AI Integrated Semantic Framework for 5G and Beyond Network Management

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Abstract:

Scalable, interpretable, and intelligent network monitoring is essential for 5G and future networks. This talk introduces Aim5B, an AI-integrated semantic framework for 5G and beyond network management. Aim5B transforms unstructured logs from key 5G core network functions into a knowledge graph aligned with the semantic structure of control-plane events. Using a large language model (LLM), it translates natural language queries into Cypher graph queries, enabling precise log retrieval, event analysis, temporal correlation, and statistical summarization, without static parsing rules or predefined dashboards.

Deployed on a real private 5G testbed, Aim5B achieved full performance across precision, recall, F1, and Jaccard metrics for detailed, domain-specific queries across network function components, while reducing management traffic by approximately 99.9% through targeted, event-specific querying. We'll discuss how these results position Aim5B as an intelligence-driven approach to real-time, scalable network observability in future mobile systems.

Keywords:

5G/6G Network Management, Semantic Log Analysis, Knowledge Graphs, Syslog, Large Language Models, AI-Assisted Querying, Graph Databases, Network Observability, Event-Driven Monitoring.