

Generative AI for **Network Assurance**

High-Dimension Diffusion for Real-Time Network Assurance

This cutting-edge solution showcases Tiami Networks' commitment to pushing the boundaries of what's possible in wireless technology. It revolutionizes real-time network analytics by leveraging Generative AI for comprehensive insights. It enables detailed joint characterization of hundreds of KPIs across Core, RAN, and OAM systems, offering a panoramic view of the network.

This advanced solution supports flexible forecasting, allowing users to zoom in or out across various network layers—from individual network functions to holistic views of Core and RAN—providing both granular and global perspectives. It adapts easily to changing commercial needs by recalibrating and filtering out less relevant network nodes without affecting MLOps.

Generative High-Dimensional Diffusion processes extensive data, such as 5G KPIs and logs, to generate actionable insights with ease. Deployed on the 3GPP rel16 NWDAF, it integrates seamlessly for real-time analytics, enhancing anomaly detection and reducing false alarms through contextual understanding and precise thresholding.

Overall, this solution ensures superior anomaly detection and network performance monitoring by creating a comprehensive global view of the network, ultimately improving service quality and operational efficiency.

It was awarded the prestigious "Most Integration Potential" award at Deutsche Telekom's most recent T Challenge.

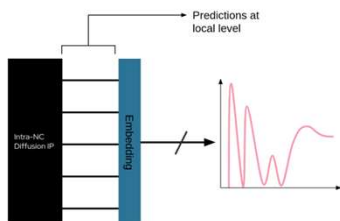


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How It Works

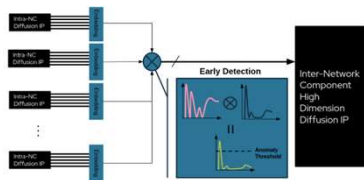
Local Level Predictions

Our solution is intended to provide both macro- and microscopic views of the network in real-time. At the micro level, our model is a function of the smallest network function area of interest. Predictions at this level already beat the state-of-the-art, however, without global context, dependent anomalies and events of interest can't be fully realized.



Gaining Additional Context

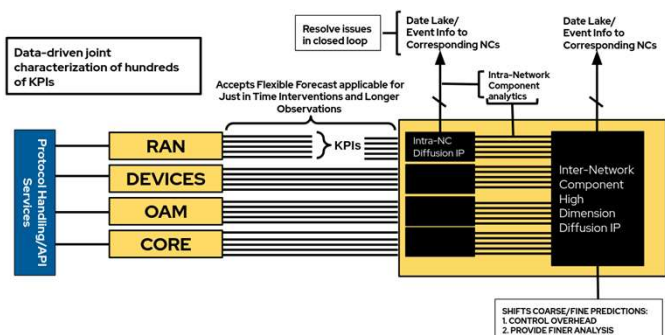
Incomplete context means failures, lost revenue, and poor customer service. We overcome this problem by creating context across network functions or areas of interest in the network. This context can be used to perform early detection of anomalies and reduce false-alarms. False alarms are reduced by understanding an anomaly threshold that our model learns during its offline-training. It may also be controlled by operators.



Taking it to a Global Level

The Inter-Network Component High-Dimensional Diffusion IP characterizes the joint-distribution of the network, creating a global view to fully understand the anomalies in the network for superior predictions and reliable detection.

Our solution is deployed on the NWDAF, a 3GPP compliant Network function in the 5G Core for real-time analytics. We implement our solution for seamless integration, deployed on the MLOPS layer of the NWDAF without any modifications in the data-ingestion services.



Use Cases

5G Network Infrastructure

Use Case: Optimization of Network Performance and Real-Time Monitoring.

Deployment Description: Our advanced solution is seamlessly integrated within the 3GPP Release 16 Network Data and Analytics Function (NWDAF), designed specifically for real-time data processing and analysis. This integration ensures that network performance metrics are analyzed instantaneously without disrupting ongoing data ingestion and processing systems. By embedding within the NWDAF framework, the solution provides real-time insights that enhance network efficiency and reliability.

Data Center Environments

Use Case: High-Capacity Data Analytics and Network Health Surveillance

Deployment Description: Deployed on high-performance servers within data centers, our technology leverages extensive computational resources to handle large-scale data analytics. This placement allows for the processing of complex, high-dimensional data sets, enabling detailed network health monitoring and performance evaluation. The robust infrastructure of data centers ensures efficient handling of high-volume analytics tasks.

Edge Computing Nodes

Use Case: Localized Analytics and Low-Latency Performance Enhancement

Deployment Description: Positioned strategically near network edge devices, this deployment supports real-time data analysis with minimal latency. Edge computing nodes facilitate prompt insights and dynamic recalibration of network parameters. This approach reduces the time delay between data acquisition and actionable insights, which is critical for maintaining optimal network performance and responsiveness.

Additional Applications

Use Case: Real-Time Anomaly Detection, Predictive Maintenance, Network Optimization, Traffic Management, QoS Improvement, Capacity Planning, Fault Diagnosis, Operational Efficiency, Regulatory Compliance, Customer Experience