5-month Internship: LLMs for Network Management: lightweight exploration and evaluation

Project

Modern network and service management increasingly relies on heterogeneous data such as telemetry, alarms, logs, configuration descriptions, and operational intents. Large Language Models (LLMs) offer new opportunities to process such structured and unstructured information, and may help support tasks such as log analysis, anomaly explanation, intent interpretation, or operational assistance. However, their practical value for network management remains unclear, especially when compared with conventional machine learning methods on concrete tasks and datasets [1].

This internship aims at a lightweight and exploratory study of LLM-based methods for selected network management tasks. A first objective will be to identify one or two concrete use cases and evaluate whether LLM-based approaches bring practical benefits over classical ML baselines. Depending on the progress of the internship, the work may then be extended toward a more practical scenario, for instance by considering lightweight models, efficient inference strategies, or initial deployment constraints such as cloud/edge execution.

Expected work

- Review recent papers on LLMs for network and service management.

- Select one or two concrete tasks, such as log/alarm classification, anomaly explanation, intent interpretation, or root-cause assistance.

- Build baseline methods using conventional ML models.

- Adapt and evaluate lightweight LLM-based methods for the same task.

- Compare the methods in terms of accuracy, robustness, cost, and practical usability.

- If time permits, explore one efficiency-oriented extension, such as lightweight prompting, small-model adaptation, speculative decoding, or cloud-edge split inference.

References

[1] G. Boateng et al. A survey on large language models for communication, network, and service management: Application insights, challenges, and future directions. IEEE Communications Surveys & Tutorials, 2025.