Master Thesis – An Empirical Study on AI Workflow Automation for Positioning

Background
The maturing capabilities of Artificial Intelligence (AI) and Machine Learning (ML) have resulted in increased attention in research and development on adopting AI and ML in 5G and future networks. AI/ML development is a highly cyclical and iterative process, i.e., model training and validating process is iteratively run with different datasets, hyperparameters, loss functions, etc., to discover the most suitable model. Furthermore, deploying the AI/ML model is also an iterative process which requires monitoring and triggering model re-training when certain conditions are fulfilled. Therefore, one of the top challenges is how to have rigorous processes and reproducible results during development and deployment, to create, track, compare, recreate, and deploy AI/ML models using cost-effective and time-saving methods. Automating AI/ML workflow in products in a maintainable and scalable manner is at the cutting edge of innovation.

Thesis Description
This thesis aims at an empirical study on the AI/ML workflow automation for positioning in Cloud Radio Access Network (RAN) context. The following steps are envisioned as part of the thesis work.

- Investigate and evaluate state-of-practice and state-of-art technologies for AI/ML workflow automation, a process known as MLOps.
- Leverage the investigated AI/ML development technologies to build AI/ML workflows for the use case of radio unit antenna positioning: 1) automate the AI/ML training process triggered by predefined conditions. 2) automate the AI/ML model training/validating, test, and deployment.
- Investigate and define metrics to evaluate the built workflow with different approaches. Perform the evaluation, analyze results, and make conclusions.

Qualifications
This project aims at students in electrical engineering, computer science, computer engineering or similar. Background in Artificial Intelligence (AI) or Machine Learning (ML) is preferred.

Extent
1-2 students, 30hp each

Location
Ericsson AB Mjärdevi, Linköping

Preferred Starting Date
Spring 2022

Keywords
AI, ML, Automation, MLOps, Cloud RAN, Telecommunication

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