ITU-ML5G-PS-038: Traffic recognition and Long-term traffic forecasting based on AI algorithms and metadata
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Agenda

- Common Background
- SDN as a part of 5G/IMT-2020 and related AI technologies
- Our SDNLab infrastructure
- Problem with fastly traffic recognition on the DataPlane
- Problem Statement. Key Features
- Challenges
- Research Background. Examples
- Task. Output Format
- Q/A
Common Background

*Fig. 1* (Reference to ITU-R 2083-0 (09/2015) “IMT Vision – Framework and overall objectives of the future development of IMT for 2020 and beyond”)

*Fig. 2* (Enhancement of key capabilities from IMT-Advanced to IMT-2020)
SDN as a part of 5G/IMT-2020 and related AI technologies
Our SDNLab Infrastructure
Problem with fastly traffic recognition on the DataPlane

Traffic recognition on the Data Plane is required for Intelligent and Automatic management.

De-facto requirements:
- SaaS approach
- Independence from the vendor’s solutions (open API);
- OpenSource platforms;
- Cross-platform
- live-migration (it's desirable)
Problem Statement. Key Features

Key features:
Metadata, Long-term forecasting
Challenges

Part 1: AI for traffic recognition and classification*
Propose for traffic types recognition based on Machine Learning, using Metadata of flows

Part 2: AI for Long-term traffic forecasting*
Propose long-term traffic forecasting on the data plane, using Metadata of recognized flows

Part 3: Suggestion with both 1st and 2nd algorithms (theoretical)
Propose theoretical models for both 1st & 2nd algorithms collaboration (UML Scheme with definition and description)

The key features of the proposal is to use the metadata of flows on the data plane at the same time the analytical application with AI/ML algorithms is located on the service level and working with the SDN/NFV network via northbound API.

For Challenge we prepared the ready to make the ML models data sets of IoT and Video traffic.

* Reference to the 6.2.1 and 6.2.2 clauses were taken from the following document “ITU AI/ML in 5G Challenge - Participation guidelines”
Research Background. Part 1 - Traffic recognition (Examples)

Research Background. Part 1 - Traffic recognition (Examples)

Research Background. Direction 1/ Direction 2


Task. Output Format

Task

Based on the proposed method make the suggestions:

1. Propose for traffic types recognition based on Machine Learning, using Metadata of flows;
2. Propose long-term traffic forecasting on the data plane, using Metadata of recognized flows;
3. Propose theoretical models for both 1st & 2nd algorithms collaboration (UML Scheme with definition and description)

The output format is the report (expected) which include the following:

- Problem analysis include the Gap analysis of current approaches for solve defined research problem;
- Architectural scheme, models, algorithm in UML notation;
- Description of solution;
- Results of modeling in the graphs and their explanation;
- Software with ML and Big data (if necessary) algorithms,
- trained ML-models;
- results in the CSV file, which contains results of training: necessary parameters (find in the evaluation clause).

*the “.docx” format is required for report.

Tools:

Python (version: 2.7 - 3.4)
or Matlab
Thank you!

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