RAN-R18-WS-crossFunc-Fujitsu - Version 0.0.2
RAN

3GPP TSG RAN Rel-18 workshop **RWS-210620**

Electronic Meeting, June 28 - July 2, 2021

Agenda Item: **4.3**

Source: **Fujitsu**

Title: **Email discussion summary for [RAN-R18-WS-crossFunc-Fujitsu]**

1 Introduction

This email discussion summary covers the following document:

RWS-210291 Study on AI for Air Interface Enhancement in Rel-18

For your convenience, the proposals are captured as following:

Proposal 1: AI for Air Interface Enhancement is suggested to be set up as a study item in Rel-18, and led by RAN1.

Proposal 2: As a new topic in Rel-18, the study focus can be:

To have a common understanding on AI terminology, functionalities, framework, and data set;

To identify the typical use cases and clarify the real time request case by case;

To have a common understanding on the evaluation methodology w/ basic assumptions on AI/ML models, and evaluate the gains from AI in the identified use cases among companies;

The life cycle of AI model and whether/how to update AI model should be studied;

Potential STD impacts should be clarified and studied.

Proposal 3: High level principles defined in "FS_NR_ENDC_data_collect" of RAN3 should be taken as a reference, and the scopes of these two study items should be clarified.

2 Comments and Questions to the Tdocs

Please provide your comments and questions in the following form:

Feedback Form 1: 1st round of questions and comments to RWS-210291

1 – Intel Technology India Pvt Ltd

We have a similar view on Rel-18 proposals. What is your view on the criteria to be used for use-case selection/identification ?

2 – Futurewei Technologies

FUTUREWEI supports the view on setting up a Rel-18 SI to study the benefits of AI/ML for PHY layer. We also think use cases like CSI compression, channel estimation and beam management are good candidates to be part of the study.

Regarding RAN AI/ML framework and terminologies, Rel-17 RAN3 SI FS*NR*ENDC*data*collect has established a good base, thus Rel-18 should only focus on additional functional blocks or interfaces that need to be introduced.

To evaluate AI/ML-based PHY layer functionalities, common evaluation methodology is important as described in this proposal. In addition, we believe establishing common datasets for identified use cases is needed as AI/ML-based approaches are data-driven. Without common datasets, it's difficult to perform benchmark study and evaluate performance across different approaches.

FUTUREWEI's propsals for additional use cases are described in RWS-210038, https://www.3gpp.org/ftp/TSG_RAN/TSG 210038.zip. Feel free to share your view at: https://nwm-trial.etsi.org/#/documents/4751

3 – Sony Corporation

Thanks for the contribution. We have a question.

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Does "*AI in PHY layer and MAC layer can provide real time level control*" mean that AI model should be updated in TTI level, or one trained AI model support output in TTI level?

4 – NEC Corporation

NEC supports having SI on AI/ML air interface enhancement. Proposed scope looks reasonable.

3 Answers to 1st round questions/comments

1. to Intel:

It is a good question.

Firstly, we think AI can have better understanding on the features of radio channels/environments, which is learned from relevant historic data. The generated knowledge from AI will bring gain to the cases with operations that requires channel state information. Therefore, the use case such as CSI feedback, link adaptation/prediction, channel estimation, beam management etc. can be taken as the candidates at first.

Secondly, the evaluation methodology should be carefully studied and designed in RAN1 in order to guarantee the simulation results are trustful and robust in various real applying scenarios.

Thirdly, the relevant STD impacts of these use cases should be clear.

2. to Futurewei:

thanks for sharing the similar views. Regarding to common datasets, we think both common datasets for training and datasets for inference should be considered.

3. to Sony:

Comparing to non real time AI and near real time AI used in high layers, closed to real time or real time AI is a unique feature of AI for air interface. Here we think the TTI level is output cycle or control cycle of AI inference. Regarding to AI model update cycles, such kind of real time update seems not feasible in terms of the computing capability/cost in gNB side and/or UE side. Besides, we think the real time request for the selected AI use cases should be clarified. Because it is important to the assumption of which kind of AI/ML model are suitable/feasible to be used in related evaluations.

4. to NEC:

thanks for sharing the similar view.

4 2nd round of questions and comments

Please provide your comments and questions in the following form:

Feedback Form 2: 2nd round of questions and comments to RWS-210291

1 – Fujitsu Limited

no further comments/questions from other companies.