**3GPP TSG RAN Meeting #106 RP-24xxxx**

**Madrid, Spain, Dec. 9-12, 2024**

## Status Report to TSG

**Agenda item:** 9.2.5

|  |  |
| --- | --- |
| **WI / SI Name** | Study on AI (Artificial Intelligence)/ML (Machine Learning) for mobility in NR |
| included in this status report | Study Item: Yes | Core part: No | Performance part:No | Testing part:No |
| **Acronym** | FS\_NR\_AIML\_Mob |
| **Unique ID** | 1020084 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-240082 |
| **Target Completion Date****(indicate if changed)** | Study Item: 09/2025 | Core part: N/A | Performance part: N/A | Testing part: N/A |
| **Overall Completion level** | Study Item: 50 % | Core part: N/A | Performance Part: N/A | Testing part: N/A |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |
| --- | --- |
| **Leading WG** | RAN WG2 |
| **Rapporteur** | **Name** | Zhongda Du |
| **Company** | OPPO |
| **Email** | duzhongda@oppo.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

 NOTE: Agreements and Open issues impacted cross-TSG aspects shall be explicitly highlighted

## 2.1 RAN1

#### 2.1.1 Agreements

#### 2.1.2 Remaining Open issues

## 2.2 RAN2

#### 2.2.1 Agreements

RAN2#127bis agreements:

Text proposal in R2-2409011 is endorsed

**Agreements**

1. The System level performance (e.g. HO performance) evaluation is optional (i.e. companies can bring results if they chose).
	1. System level performance for measurement event prediction can be prioritized by companies if they chose to do it.

1. RAN2 will prioritize discussions on intermediate KPI discussion before discussing system level performance for the corresponding use case.

3 Discussion on what (type of information)/how generalization study can take place in Nov. meeting

4 The SLS simulation assumption discussion is covered in the post#127bis email discussion by assuming:

* The simulation assumptions agreed for measurement event prediction and RLF prediction is taken as baseline for SLS in principle
* The HO model in 36.839 is taken as baseline
* The HO performance will be HOF and number of HO only and definition in 36.839 is taken as baseline
* The baseline of HO performance is R15 legacy measurement and HO procedure

**Agreements on simulation table**

1: The spreadsheets are organized into three separate folders, with each folder corresponding to one of the three use cases.

2: The RRM prediction use case is used as a template for the documentation process. This approach will be similarly applied to the measurement event prediction and RLF/HOF prediction use cases, the spreadsheets of which are subject to revision upon availability of the simulation results.

3: Individual spreadsheet for each identified scenario for the use case of RRM prediction is created, e.g., scenarios 1~6 with the understanding that we can add more spreadsheets as required e.g., when other scenarios are identified.

4: Distinct sheets are initially set up for capturing the simulation assumptions, evaluated KPIs and definitions, and simulation results from companies, with the understanding that we will add more sheets as needed and in accordance with discussions that emerge during the evaluation process.

5: The columns in the simulation results sheet are categorized into five main groups: general information, variable settings, selectable simulation assumption, model-related information and performance metrics for various KPIs.

6: The ‘case’ column considers the three sub-use cases and their combination with additional factors. One colume for additional factors will be introduced. Those factors can be determined through discussions as the evaluation progresses.

7: Adopt the example spreadsheets provided in the attachment as a starting point, understanding that their content is flexible and can be modified as the evaluation progresses.

*8:* Create a folder on the 3GPP FTP server for companies to upload their simulation results. Within this folder, create individual subfolders for different use cases. For each use case different subfolders under the main directory corresponds to the different identified scenairos.The file name of the excel table follows the format: 'MeetingNumber\_CompanyName\_TdocNumber\_version number'.

9: Mediatek will provide example template, structure and rules to follow. Companies are expected to follow these examples.

**Agreements**

1 It is mandatory to follow the following rules for filling out the table for simulation results:

* Adhere to the format provided in the example, except for the specified columns. The columns 'Other Factors,' 'AI Model Type,' 'Details of AI Model,' and 'Non-AI/Simple AI Method' do not have strict content restrictions.
* Keep the same parameter units as the template provided.
* Companies are not required to fill in all the information, e.g. some performance metrics. If companies can’t provide the information, please leave the cell blank.

NOTE: The rapporteur will not include the inputs if these rules are not followed

1. Adopt the agreed spreadsheet (after email discussion) examples of different RRM prediction scenarios to capture companies’s simulation results.
2. For intra-frequency temporal domain, higher UE speeds result in larger prediction errors
3. Initially, increasing the OW length can enhance prediction accuracy in the temporal domain case A, especially when the OW is relatively short. However, once the OW exceeds a certain threshold, further increases do not yield significant benefits. Conversely, for PW, longer durations correlate with decreased prediction accuracy. RAN2 will not define the actual threshold and fast fading assumption.
4. Majority of companies observe that among sub cases 1, 2, and 3, at least with shorter prediction window sub case 2 demonstrates the highest prediction accuracy
5. Companies can provide multiple real time RSRP value(s) and/or average RSRP value over the entire window and should indicate in their simulation results what they have used. The companies should at least provide the results of only one value it should be the last value at the end of the PW. We will add two columns in the spreadsheet to capture the last value and the average value.
6. Companies need to report whether earlier predicted results are also used as inputs for future RRM prediction.

**Agreements on inter-frequency**

1. Companies should report with their simulation the correlation coefficient
2. Higher-to-lower and lower-to-higher frequency prediction is comparable
3. For co-located scenario, the UE speed in the inter-frequency case has minor impact on prediction accuracy

**Agreements**

* Measurement event prediction simulations will at least focus on intra-frequency FR2, case A, and second study goal (i.e. HO KPI improvement). FFS what is KPI.
* Companies can bring simulation results for intra-frequency measurement reduction for FR1 and report what they are doing. Focus on temporal case B.
* Companies will prioritize simulations on indirect method. Companies can bring simulations on direct method and should report what method is being used.
* Measurement event prediction results are expected in RAN2#129

Agreements on simulation assumptions

* *The Simulation assumption of RRM measurement prediction can be reused unless otherwise specified.*
* Companies can pick and report what they are using for filtering options (similar to RRM prediction)
* Companies will focus on sub-case 2 for measurement event prediction. Companies can simulate other sub-cases if they wish and report what they are using.
* Leave the simulation parameter discussion for email discussion. Pick only one value for A3.
* It is up to company implementation how to model UE behavior after A3 event is trigger. Focus on intermediate KPIs for this exercise. System level KPI is FFFs
* For measurement event prediction, traffic is not simulated.

**Agreements on inputs/outputs and KPIs**

1. For indirect measurement event prediction, the intermediate output (i.e., the output of RRM prediction model) is RSRP of serving/neighboring cells. The final output is the expected occurrence time of a certain measurement event (ex. event A3).
2. For direct measurement event prediction, the model output is the probability of event occurrence within a time window.
3. A3 event prediction should follow legacy rules (i.e. the “predicted” conditions have to persist for the duration of TTT).
4. As baseline, we will use RLF event prediction KPI:
* for indirect: F1 score. the following can be reported: RSRP difference, missed event detection, false event detection. FFS how to define F1 score.
* time difference of true time event reporting triggered and predicted time event reporting triggered, true event prediction.
* for direct: F1 score. The following can be reported: missed event detection, false event detection,
* Continue discussion over email discussion to see if there is a difference.

RAN2#128 agreements:

Text proposal in R2-2410186 is endorsed

**Agreements/Observations to be captured in TR**

1. The prediction accuracy for intra-frequency temporal domain case B reduces as MRRT increases.
2. For temporal domain case B, with the same MRRT, different skipping pattern can provide different prediction performance. Companies may report the adopted skipping pattern when providing simulation results. Companies are not required to run new simulations but can clarify in the spreadsheet. We can capture in the TR how the skipping patter affects the performance.
3. For the inter-frequency prediction, the evaluation results show that the higher the correlation coefficient is between two frequency layers, the higher the prediction accuracy. FFS on observations on low correlations.
4. For inter-frequency, cluster as input (i.e. measurements from different cells as inputs )can improve the prediction accuracy than single cell as input. For temporal domain, the gains are unclear. RAN2 will focus on frequency domain for cluster based approach.
5. In cluster approach the model takes measurements from more than one cell as inputs.

**Agreements/observations**

1. Companies can compare results with non-AI approaches. Temporal domain, sample and hold, and frequency domain, pathloss offset. Companies can consider other simple models (e.g. ARIMA).
2. For FR1 intra-frequency temporal domain case B, when PW is short, the performance between AI and sample-and-hold is not significant. However, when PW becomes larger, AI outperforms sample-and-hold.
3. In frequency domain prediction cases (2GHz and 4GHz), cell-based approaches achieve limited gain compared to pathloss offset without the help of neighbor cell measurement. The cluster-based shows better performance compared to pathloss offset.
4. For intra-frequency temporal domain case A, AI can provide gains (in terms of L3 cell RSRP difference) compared to sample and hold. The gain improves with UE speed.

**Agreements on generalization**

1. Reuse the evaluation methodology in TR38.843 for generalization study, i.e., the generalization performance is evaluated with the following cases,
* *Baseline:* The AI/ML model is trained using the dataset with Configuration #B and tested using the dataset with Configuration #B.
* *Generalization Case #1 (GC#1):* The AI/ML model is trained using the dataset with Configuration #A but tested using the dataset with Configuration #B.
* *Generalization Case #2 (GC#2):* The AI/ML model is trained using mixed datasets with both configurations and tested using the dataset with Configuration #B.

2 Companies can choose which case they compare with and should report it with simulation results.

3 Generalization issues on RRM measurement prediction are prioritized.

4 Start the study with generalization issue with RRM measurement prediction in temporal domain. Companies can chose to study frequency domain prediction cases and report what they have simulated.

5 Study generalization over UE speeds

6 The simulation assumption of FR1 temporal domain case B is reused for generalization study with 3 UE speeds i.e. 30Km/h, 60Km/h and 90Km/h. FFS on combinations

7 The simulation assumption of FR2 temporal domain case A is reused for generalization study with 3 UE speeds i.e. 60Km/h, 90Km/h and 120Km/h. FFS on combinations

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| **Agreements on generalization**1 Between GC#1 and GC#2, RAN2 focus on GC#22 simulation combination for FR1 generalization study:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Training @Dataset: 30km/h | Training @Dataset: 60km/h | Training @Dataset: 90km/h | Inference @30km/h | Inference @60km/h | Inference @90km/h |
| Baseline | Yes  |  |  | Yes  |  |  |
| GC#1 | Yes |  |  |  | Yes | Yes |
| GC#2 | Yes | Yes | Yes | Yes |  |  |
| Baseline |  | Yes |  |  | Yes |  |
| GC#1 |  | Yes |  | Yes |  | Yes |
| GC#2 | Yes | Yes | Yes |  | Yes |  |
| Baseline |  |  | Yes |  |  | Yes  |
| GC#1 |  |  | Yes | Yes | Yes |  |
| GC#2 | Yes | Yes | Yes |  |  | Yes |

2a simulation combination for FR2 generalization study:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Training @Dataset: 60km/h | Training @Dataset: 90km/h | Training @Dataset: 120km/h | Inference @60km/h | Inference @90km/h | Inference @120km/h |
| Baseline | Yes  |  |  | Yes  |  |  |
| GC#1 | Yes |  |  |  | Yes | Yes |
| GC#2 | Yes | Yes | Yes | Yes |  |  |
| Baseline |  | Yes |  |  | Yes |  |
| GC#1 |  | Yes |  | Yes |  | Yes |
| GC#2 | Yes | Yes | Yes |  | Yes |  |
| Baseline |  |  | Yes |  |  | Yes  |
| GC#1 |  |  | Yes | Yes | Yes |  |
| GC#2 | Yes | Yes | Yes |  |  | Yes |

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| **Agreements on measurements events**1 Agreed values for Case A. NOTE1 indirect prediction only

|  |  |  |
| --- | --- | --- |
| Parameters | baseline value | Note |
| A3 event offset (db) | 2 | Open for 3db |
| TTT (ms) | 320 | Open for one shorter value |
| UE speed (km/h) | 90 | Open for 60 and 120km/h |
| OW length (ms, note1) | N/A | Up to implementation |
| PW length (ms, note1) | 400 | Open for more values |
| Max ETD (ms, note1) | 80 | Open for more values |

2 Agreed values for Case B. NOTE1 indirect prediction only

|  |  |  |
| --- | --- | --- |
| Parameters | baseline value | Note |
| A3 event offset (db) | 2 | Open for 3db |
| TTT (ms) | 320 | Open for one shorter value |
| UE speed (km/h) | 30 | Open for 60 and 90km/h |
| OW length (ms,note1) | N/A | Up to implementation |
| PW length (ms,note1) | 200 (non-sliding)40ms (sliding) | Open for more values |
| Max ETD (ms, note1) | 80 | Open for more values |
| MRRT | 50% | Open for more values |

3 Company can report which filtering options is being used for the input L3 RSRP of sub-use case 2: option 1, option 2, option 3. 4 to capture the 3 options into TR |

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| **Agreements on RLF predictions**1 Agree to following values (NOTE1 indirect only)

|  |  |
| --- | --- |
| Parameter | Value |
| Qin threshold | -6db |
| Qout threshold | -8db |
| Sample rate (TIndication\_interval) | 20ms (FR2)/40ms(FR1)  |
| Qin evaluation period | 100ms |
| Qout evaluation period | 200ms |
| T310 | 1000ms |
| N310 | 1 |
| N311 | 1 |
| Max ETD (ms, note1) | 80ms |
| PW length (ms,note1) | 400 |
| OW length (ms, note1) | Up to implementation |

2 The beam transmission pattern is synchronized across the site/cells i.e., at any given time the transmitted beam index is the same across the site/cells.  |

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| --- |
| **For System level simulation**1 For measurement event prediction for temporal domain case B:UE reports when A3 event is satisfied with actual measurements and predicted results. And handover command will be received after handover preparation. Remove T0 from the picture**2** For measurement event prediction for temporal domain case A, company focus on option 2 or option 3. **Option 2:** network transmit handover command purely based on actual measurement event regardless whether an actual measurement result(@t2) is earlier or later than predicted measurement event((@t1)) **Option 3**: For AI mobility, HO preparation starts when an event is predicted to happen (i.e., t0), and HO command is sent when A3 entering conditions are met based on actual/real measurement and an event is predicted to be met for the duration of TTT.**3** Handover Preparation time is 40ms and handover execution time: 40ms**4** RAN2 focus on indirect prediction methodology.  |

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| **Agreements on direct prediction for RLF and event predictions****1** The time window for direct prediction goes for interpretation 2**2** For direct prediction, following values are agreed and company can report probability threshold for corresponding case (other values are allowed)

|  |  |  |
| --- | --- | --- |
|  | Measurement event prediction | RLF prediction |
| Time window length (Interpretation 2) | PW length as indirect case(FR1:200ms; FR2:400ms) | PW length as indirect caseFR1/FR2: 400ms |

 |

#### 2.2.2 Remaining Open issues

For RRM measurement use case:

1, To collect simulation results based on updated template and conclude further statistics observation based on collected simulation result

For Measurement event use case:

1, Evaluation based on Simulation result

For RLF use case:

1, Evaluation based on simulation result.

Generalization study:

1, Evaluation based on simulation result

SLS evaluation:

1, Evaluation based on simulation result

HOF prediction is down prioritized

Issues covered by following objectives in the SID:

* Potential specification impacts of AI/ML aided mobility [RAN2]

## 2.3 RAN3

#### 2.3.1 Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

RAN4#113 meeting agreements:

Issue 2-1-9a: L3 RSRP prediction accuracy definition

Agreement:

* For testing, Absolute L3 Predicted RSRP Accuracy = reported predicted L3-RSRP – ground truth of L3-RSRP
	+ FFS Ground truth definition of L3-RSRP for FR1 and FR2

Issue 3-1-1: Testing setup

Agreement

* + RAN4 to further discuss:
		- Whether and how legacy testing setup for L3 measurements can be reused for FR1 and FR2

Issue 3-2-1: Testing goal

Agreement

* + As baseline, the testing goal is to verify whether the minimum performance of AI/ML functionality/feature can be achieved.

#### 2.4.2 Remaining Open issues

For General Aspects: Assessments of sub-use-case priorities.

For RAN4 requirements: Analyses on performance metrics and factors that potentially impact performance requirements.

For Testability aspects: Evaluations on the testing setup, further study new testability aspects, e.g., FR1/FR2, consistency in time domain, and the influence of inter-carrier scenarios.

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

NOTE: This section only needs to be filled in for WI/SIs where there is a corresponding relevant WI/SI in SA/CT.

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

NOTE: This section should also flag any critical dependencies that need TSG attention.

## 4. References

NOTE: This can be e.g. a list of all related Tdocs in the affected WGs since last TSG, references to LSs, produced TRs/TSs, the work/study item description or status reports of previous TSGs.

**Contributions submitted to RAN2#127bis meeting:**

R2-2407980 Discussion on measurement event prediction vivo

R2-2408073 Simulation results for RRM measurement prediction CMCC

R2-2408174 Simulation results and other aspects on RRM measurement prediction Spreadtrum Communications, BUPT

R2-2408206 Simulation results of RRM Measurement Prediction CATT, Turkcell

R2-2408265 Discussion on RRM prediction Xiaomi

R2-2408298 Other Aspects for AI based Measurement Event Prediction Continental Automotive

R2-2408318 Discussion on measurement event prediction Lenovo

R2-2408326 Discussions and evaluations on RRM measurement prediction NTT DOCOMO, INC.

R2-2408358 Discussion on other aspects related to RRM measurement prediction ASUSTeK

R2-2408359 Discussion on measurement event prediction ASUSTeK

R2-2408393 Simulation results for RRM measurement prediction Qualcomm Incorporated

R2-2408394 Measurement Event prediction Qualcomm Incorporated

R2-2408419 Discussion on some clarification for RRM measurement prediction NEC

R2-2408431 Evaluation methodology, scenario and simulation assumption for measurement event prediction MediaTek (Chengdu) Inc.

R2-2408438 AI/ML RRM measurement prediction TCL

R2-2408442 Discussion on cluster based RRM measurement prediction for high speed railway communications BJTU

R2-2408487 RRM measurement prediction Lenovo

R2-2408493 Discussion on measurement event prediction Jio

R2-2408521 Discussion on measurement event prediction ZTE Corporation

R2-2408551 Target scenarios for measurement event prediction NEC

R2-2408679 Discussion on measurement event predictions III

R2-2408740 AI/ML RRM measurement prediction Fraunhofer HHI, Fraunhofer IIS

R2-2408825 AI based measurement events prediction: Use cases, and simulations Ericsson

R2-2408872 AI-ML based Inter-frequency measurement prediction Rakuten Mobile, Inc

R2-2408874 AI-ML based RLF/HO failure prediction Rakuten Mobile, Inc

R2-2408925 Simulation results for RRM measurement predictions Interdigital Inc.

R2-2408926 Measurement event prediction Interdigital Inc.

R2-2408930 Discussion on Measurement Event Prediction Nokia

R2-2408967 Discussion on RRM Measurement Prediction Framework Meta

R2-2408968 Evaluation Assumptions for RLF/HO Failure Prediction Meta

R2-2408974 Discussion on RRM measurement prediction ETRI

R2-2408978 Discussion on measurement event predictions ETRI

R2-2409011 Text proposal on TR 38.744 OPPO

R2-2409066 Event prediction use cases and KPI LG Electronics Inc.

R2-2409095 Discussion on Measurement Event Predictions SHARP Corporation

R2-2409126 Discussion on simulation assumption for RLF prediction KDDI Corporation

R2-2409188 Simulation results for RRM Measurement Prediction CEWiT

R2-2409203 Simulation results and discussion on RRM measurement prediction Huawei, HiSilicon

R2-2409207 Evaluation on RRM measurement prediction ZTE Corporation

R2-2409413 [POST127bis][016][AI Mob] Simulation results (Mediatek) MediaTek Inc.

**Contributions submitted to RAN2#128 meeting:**

R2-2409651 Simulation results of RRM Measurement Prediction CATT, Turkcell

R2-2409652 Discussion on generalization for RRM prediction CATT, Turkcell

R2-2409667 Updated simulation results for RRM measurement prediction vivo

R2-2409668 Discussion on generalization study for RRM prediction vivo

R2-2409795 Simulation assumption for Measurement event prediction NEC

R2-2409823 Discussion on the simulation results for RRM measurement prediction Samsung

R2-2409829 Discussion on Generalization Issues for AI/ML Mobility Samsung

R2-2409866 Discussion on RRM prediction simulation result Xiaomi

R2-2409867 Simulation assumptions on event/RLF/SLS and model generalization Xiaomi

R2-2409868 Simulation Results for AIML RRM Prediction and Remaining Issues MediaTek Inc.

R2-2409869 Simulation Assumptions of SLS, measurement event prediction, RLF prediction and generalzatiion study MediaTek Inc.

R2-2409971 Cluster-based approach, UE-sided vs. network-sided models, etc. Apple

R2-2409972 Model generalization, RLF evaluation assumptions, etc. Apple

R2-2409991 Simulation assumptions and methodology for Measurement Event prediction, RLF prediction, and SLS Qualcomm Incorporated

R2-2410020 Simulation results on the RRM measurement prediction and discussions NTT DOCOMO, INC.

R2-2410023 Discussions on evaluation methodology of AI/ML for mobility NTT DOCOMO, INC.

R2-2410037 Discussion on cluster based RRM measurement prediction BJTU

R2-2410084 Other aspects for RRM measurement prediction Lenovo

R2-2410144 Simulation results on RRM measurement prediction Spreadtrum, UNISOC, BUPT

R2-2410186 Text proposal of 38.744 OPPO

R2-2410187 Discussion on simulation result of RRM measurement prediction OPPO

R2-2410188 Discussion on generalization study of AI mobility OPPO

R2-2410190 Summary of [POST127bis][022][AI mobility] Simulation Assumptions (OPPO) Hangzhou Mengyuxiang

R2-2410263 Discussion on generalization aspects Ericsson

R2-2410339 Simulation results for RRM measurement prediction CMCC

R2-2410345 Discussion on other aspects of simulation assumption CMCC

R2-2410474 Simulation results for temporal, inter-frequency and spatial domain RRM measurement predictions Ericsson

R2-2410507 Simulation results for RRM measurement predictions Interdigital Inc.

R2-2410508 Generalization of AIML models for RRM measurement prediction Interdigital Inc.

R2-2410522 Discussion on RRM measurement predictions and prediction-based mobility events Sharp

R2-2410539 Simulation results for RRM measurement prediction Huawei, HiSilicon

R2-2410540 Discussion on simulation assumptions and generalization Huawei, HiSilicon

R2-2410568 Discussion on measurement event prediction Jio

R2-2410678 Simulation and evaluation of RRM measurement prediction Indian Institute of Tech (M), IIT Kanpur

R2-2410697 Discussion on simulation assumptions for RLF prediction KDDI Corporation

R2-2410744 AI-ML based Inter-frequency measurement prediction Rakuten Mobile, Inc

**Contributions submitted to RAN4#113 meeting:**

R4-2417622 Study of impacts on RAN4 requirements for AI mobility OPPO

R4-2417623 Study of testability and interoperabilityfor AI mobility OPPO

R4-2417698 Discussion on impacts of AIML mobility on RRM requirements CATT

R4-2417699 Discussion on testability and interoperability issues for AIML mobility CATT

R4-2417895 Discussion on RRM requirements of AI mobility MediaTek Inc.

R4-2417896 Discussion on testability and interoperability of AI mobility MediaTek Inc.

R4-2417941 Discussion on study of testability and interoperability for AIML mobility Xiaomi

R4-2417951 Discussion on impacts on RAN4 requirement for AI mobility Xiaomi

R4-2418242 Impact of AI based mobility on RRM requirements Qualcomm Incorporated

R4-2418243 Testability and interoperability for AI based mobility Qualcomm Incorporated

R4-2418278 Topic summary for [113][220] FS\_NR\_AIML\_Mob Moderator (Nokia)

R4-2418296 Discussions on RAN4 requirement impacts of AIML for mobility NTT DOCOMO, INC.

R4-2418460 Discussion on impacts on RAN4 requirements for AI/ML for mobility CMCC

R4-2418461 Discussion on testability and interoperability for AI/ML for mobility CMCC

R4-2418500 Discussion impacts on requirements of AI/ML mobility ZTE Corporation, Sanechips

R4-2418501 Discussion on the Interoperability and testability aspects ZTE Corporation, Sanechips

R4-2418528 Study on AI (Artificial Intelligence)/ML (Machine Learning) for mobility in NR: Study of testability and interoperability Apple

R4-2418529 Study on AI (Artificial Intelligence)/ML (Machine Learning) for mobility in NR: General Aspects and Work Plan Apple

R4-2418530 Study on AI (Artificial Intelligence)/ML (Machine Learning) for mobility in NR: Study of impacts on RAN4 requirements Apple

R4-2418673 Discussion on genereal aspects in AIML mobility Huawei, HiSilicon

R4-2418674 Discussion on impacts of RAN4 requirements in AIML mobility Huawei, HiSilicon

R4-2418675 Discussion on testability and interoperability issues in AIML mobility Huawei, HiSilicon

R4-2418755 Discussion on impacts on RAN4 requirements for AI mobility vivo

R4-2418756 Discussion on testability and interoperability for AI mobility vivo

R4-2419176 On General Aspects of AIML Mobility Nokia

R4-2419186 On RRM Requirement Impacts of AIML Mobility Nokia

R4-2419187 On Testability and Interoperability Issues for AI/ML Mobility Nokia

R4-2419188 Discussion on AI mobility general aspects Samsung

R4-2419190 General discussion on AI mobility regarding testability and interoperability Samsung

R4-2419362 General discussion on AI/ML for mobility Ericsson

R4-2419363 On requirements for AI/ML based mobility Ericsson

R4-2419364 On testability issues related to AI/ML for mobility Ericsson