与场景亲密接触
做方案创新专家

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RP-233042

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Agenda Item: 9.1.1.1

Considerations on Rel-19 AI/ML for Air Interface

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Potential objectives for Rel-19 AI/ML for air interface

According to 3GPP RAN chair's summary in RP-232745, the following potential objectives for Rel-19 AI/ML for air interface are summarized for further discussion in 3GPP RAN#102 meeting:

AI/ML – Air Interface WI

- References: RWS-230488, RP-231540, RP-232611
- Potential objectives:
  - Consider support single sided models for,
    - Positioning, further discuss whether to support all 5 sub use cases.
    - Beam management for DL Tx prediction in both UE-sided and NW sided model,
    - Consider support of single sided model for CSI prediction, if it is recommended to proceed with normative work taken all WG's outcome in Q4-23 into account
  - Consider support two-sided model for CSI compression, if it is recommended to proceed with normative work taken all WG's outcome in Q4-23 into account
  - Consider support the necessary/recommended LCM components for selected sub use cases
  - RAN4 requirements and test cases for AI/ML enabled features
- Taking into account the progress in RAN WGs in 4Q'2023

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Proposed scopes for Rel-19 AI/ML for air interface

The Rel-18 AI/ML for NR air interface SI result has been well documented in 3GPP TR 38.843, including general AI/ML framework, use cases, evaluations and potential spec impact assessment. According to 3GPP RAN chair's summary in RP-232745, ~4 TUs are estimated for AI/ML for air interface in Rel-19. Based on TR 38.843 and taking into account the latest progress in RAN1#115, from 3GPP RAN1's perspective, the following scope for Rel-19 AI/ML for air interface is proposed that may fit the estimated TUs:

- **Proposed scope for Rel-19 WI (~2 TU)**
  - Normative work for single-sided models for AI/ML-based positioning (including both direct AI/ML positioning and AI/ML assisted positioning) and beam management (including both BM-Case1 and BM-Case2), including necessary signaling/mechanism(s) at least for the following procedures:
    - Functionality-based LCM, model inference, model/performance monitoring, data collection for inference and monitoring, as well as functionality selection, activation, deactivation, switching and fallback operation and UE capability enhancements.
    - Other aspects: CSI resource configuration/measurement/reporting/processing procedures enhancement.

    Note: model-ID based LCM needs more discussion and justification in Rel-19.
- **Proposed scope for continuation of Rel-18 SI (~1 TU)**
  - Two-sided model for AI/ML-based CSI compression
    - E.g., further study trade-off between performance and complexity/overhead, issues related to inter-vendor collaboration, paring procedure between UE and gNB.
  - Single-sided model for AI/ML-based CSI prediction
    - E.g., further study the performance gain over non-AI/ML based approach and associated complexity.
- **Proposed scope for new Rel-19 SI (~1 TU)**
  - Limited new AI/ML-based use cases (≤2 new cases), e.g., AI/ML-based L1/L2-triggered or L3 mobility enhancement and possibly new two-sided model other than CSI compression.
  - Performance gains/benefits should be significant compared to non-AI/ML baselines to justify SI efforts. Based on Rel-18 experiences, trade-off between performance and complexity/overhead is key to whether or not there would be a possible follow-up WI phase. Therefore, the selection of new use case(s) for Rel-19 SI, if any, should be very careful.

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Thanks

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