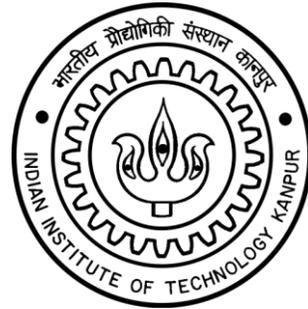


Views on Release-19 Positioning



IIT KANPUR

Indian Institute of Technology, Kanpur

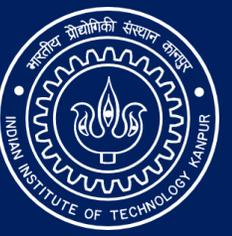
Co-Sourced by: CEWiT, Locaila, Indian Institute of Technology Madras

Candidate Positioning Features for Rel-19



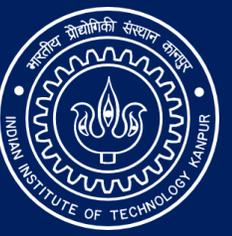
- Enhancement on Release-18 features
 - Carrier phase-based positioning (CPP)
 - Sidelink positioning
- New possible features for Rel. 19
 - Ambient IOT Positioning
 - XR Positioning

Rel-19 Positioning: Overall View



- Release 19 is not expected to be as heavily loaded with new features as Release 18. Keeping Release 19 requirements in mind most critical positioning features should be focused upon in Rel-19.
- The primary focus should be on taking up the Rel-18 leftover topics and enhancing them.

Why 5G Carrier Phase Positioning? (Over GNSS and Legacy Time Methods)



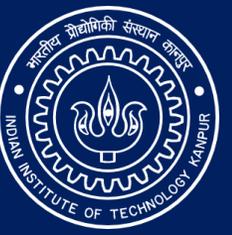
- Higher Accuracy in Relatively Narrow Bandwidth.
- Simpler solution to Integer Ambiguity
- Market Competitiveness than Legacy Positioning

Progress in Rel-18 Carrier Phase Positioning



- Significant work was done on defining phase measurement and the PRU function for post-correcting inter-station phase errors.
- Rel-18 only supports basic CPP without any integer ambiguity resolution. The current Rel-18 CPP is expected to work in non-standalone mode.
- However, the critical issue of Integer Ambiguity remains unresolved.
- **Observation:** In our understanding, the existing CPP feature may not be able to meet the target requirement of centimeter-level accuracy without proper integer ambiguity resolution.

Sidelink Market Perspective



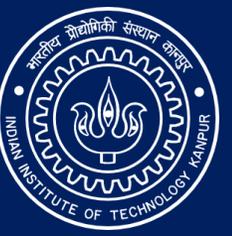
- Improved Safety for Autonomous Vehicles
- Early Commercialization of 5G V2X Service
- V2X products are ready for launch, and better localization will boost further the activity.



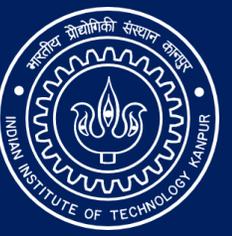
SL Positioning Enhancement in Rel. 19

- Rel. 18 is defining the initial framework for SL positioning.
- Some of the methods, like SL-TDOA, will remain non-optimization for submeter-level accuracy.
- Therefore, the leftover items from Rel 18 should be considered in the Rel 19 work.
- Further, the power optimization of the SL positioning feature should be considered in the Rel 19 work.

Proposals



- In Rel 19 RAT based positioning enhancement should consider further enhancement for the following methods,
 - Carrier phase Positioning
 - Solution for Integer Ambiguity Resolution
 - Carrier Phase-based Sidelink Positioning
 - Sidelink positioning
 - Left over like optimization of SL-TDOA, partial coverage use case, etc.
 - The power optimization of the SL positioning feature.



Thank You!