



5G Tracker Android application for collecting and visualizing 5G performance data (2020-287)

An Android and web application to track 5G network performance.

Applications

- 5G research and development

Overview

5G telecommunication technology has several advantages over its predecessors. However, conducting research in 5G poses several challenges: 1) no mature tool for smartphones (i.e. user equipment or UE) to collect UE-side measurements related to 5G and its performance; 2) the 5G-NR (New Radio) related APIs in Android OS's latest version 10 does not provide meaningful information about 5G network status or signal strength; and, 3) the coverage maps provided by carriers are inaccurate and the performance varies significantly.

To overcome these challenges, researchers at the University of Minnesota have developed 5G Tracker - an Android app to collect 5G performance data. Consisting of popular network performance diagnostic tools such as iPerf3 and Ping, this Android app enables researchers to collect several types of network performance data as well as data associated with the UE. In addition, collected performance data from APIs is processed to achieve useful and reliable interpretation. This app makes it easy to crowdsource data collection as well as collaborate with other researchers using the obtained data. Visualization of 5G coverage maps and performance maps is achieved via <https://5gophers.umn.edu> website.

Website and App are currently unavailable. A new version is under development.

Key Benefits & Differentiators

- Facilitates easy data collection, visualization, and collaboration.
- Works with all major network providers: Verizon, T-Mobile, and Sprint.
- Information collected include 5G-NR signal strength, moving speed, tower IDs, azimuth bearing, etc.
- Interactive web application for data visualization.

Phase of Development

TRL: 8-9

- 5G Tracker Android app available for download.
- 5Gophers website to visualize 5G coverage and performance.
- Backend to store and process data collected by 5G Tracker app and feed the data to 5Gophers
- Backend also allows collaborators to download data.

Technology ID

2020-287

Category

Software & IT/Communications & Networking

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Publications

A First Look at Commercial 5G Performance on Smartphones. Proceedings of The Web Conference 2020. 2020.

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