

# Do Web Browsers Dream of Software Defined Radios?

Note that this topic does **not** involve WebSDR.

## Motivation

While cellular networks are increasingly performant, e.g., due to radio and architectural improvements, the requirements of applications also increase. Taking the web as an example, the number and size of resources of pages is always increasing [1].

One way to further optimize web performance is to shorten control loops between endpoints. Previous work [2] at the Chair of Connected Mobility explored using physical layer information captured using a software defined radio (SDR) to influence congestion control in a download throughput test. The setup is mainly based on [3,4].

The goal of this work is to improve the existing setup by including uplink information and by performing web performance measurements using an existing web page replay and performance measurement toolchain.

## Your Task

- Improve UE Cell Tracker and other tools to also cover the cellular uplink.
- Integrate and run web performance measurements.
- Evaluate the performance results.

## Requirements

- General knowledge of computer networking
- Basic understanding of cellular networks
- Interest or experience in Rust programming

## References

[1] HTTP archive. Report: Page weight. <https://httparchive.org/reports/page-weight>

[2] Bastian Schmidt. UE Cell Tracker. <https://github.com/bastian-src/UECellTracker>

[3] Xie, Y., Yi, F., & Jamieson, K. (2020). PBE-CC: Congestion Control via Endpoint-Centric, Physical-Layer Bandwidth Measurements.

[4] Xie, Y., & Jamieson, K. (2022). NG-Scope: Fine-Grained Telemetry for NextG Cellular Networks.

## Contact

Justus Fries [fries@in.tum.de](mailto:fries@in.tum.de)

