1st European Workshop on Testbed Based Wireless Research

Demo Proposal

Title: "libLTE – A Library Facilitating Wireless Research, Experimentation and Prototyping of 3GPP LTE Systems"

Author: Dr Ismael Gomez

Institution: CTVR, The Telecommunications Research Center, Trinity College Dublin.

Abstract:

libLTE is a highly modular, free and open-source library of building blocks for the 3GPP Long Term Evolution (LTE) Release 8 standard (PHY to IP). These building blocks allow anyone to quickly implement a low-cost software-defined mobile terminal (UE) or base station (eNodeB). A UE implementation is currently provided as an example. The library can be downloaded from http://github.com/libLTE.

Typical use-cases include:

- ✓ Low-cost research, experimentation and prototyping of new LTE-based applications, e.g. Video QoE-driven scheduling, LTE on radar bands, LTE in unlicensed bands, etc.
- ✓ Experimentation and performance evaluation in a standard-compliant system of modem parts or features, including new detectors, equalizers or decoder implementations, novel interference cancellation techniques, CoMP transmission/reception algorithms, etc.
- ✓ Development of hands-on tutorials or graduate/under-graduate courses on LTE.
- ✓ LTE network scanner or sensing. Assessment of network deployment quality and performance.

The library is not tailored to any specific platform, making it ideal to be deployed to general-purpose processors (GPP) or embedded systems. To this aim, the code is written in ANSI C and dependencies are minimal, requiring *no framework* to run it. Currently libLTE uses the NI USRP family of devices to transmit and receive real signals. While any UHD-compatible hardware can be used with libLTE, our recommendation is to use B2x0 frontends.

In this **demo**, we will show a real-time over-the-air transmission from an eNodeB to a UE using the PHY layer only. We will view how simple it is to create new applications and the kind of modularity and flexibility that the tool offers. In a parallel demo, we will demonstrate the scanning/sensing capabilities of libLTE. We will try to capture an LTE signal transmitted from a nearby commercial network and view some measurements and parameters in real-time.