CSIRS DESIGN AND IMPLEMENTATION FOR THE INDIGENOUS 5G TESTBED

A Project Report

submitted by

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CERTIFICATE

This is to undertake that the Thesis titled **CSIRS DESIGN AND IMPLEMENTATION FOR THE INDIGENOUS 5G TESTBED**, submitted by me to the Indian Institute of Technology Madras, for the award of the degree of **Master of Technology**,is a bona fide record of the research work done by him under my supervision. The contents of this thesis, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma.

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ABSTRACT

KEYWORDS: CSIRS,PMI,RI,CQI

The eventual goal of the forthcoming 5G wireless networking is to have relatively fast data speeds, incredibly low latency, substantial rises in base station's efficiency and major changes in expected Quality of Service (QoS) for customers relative to the existing 4G LTE networks.An integral step in the process of developing 5G systems is performing extensive simulations to verify the efficacy of algorithms before they are implemented on hardware. This work presents the theoretical framework and design parameters associated with the simulation of an end to end communication system adhering to 5G NR specifications.

Pilot-assisted channel estimation is a method in which known signals, called pilots, are transmitted along with data to obtain channel knowledge for proper decoding of received signals. This thesis aims at channel estimation for 5G downlink using CSIRS with Channel estimation algorithms such as Least Squares (LS) for less complexity at hardware. Particular emphasis is laid on the examination of channel estimation at UE using CSIRS and report back the channel quality parameters to the gNB like CQI and PMI and RI also providing adequate performance- measured using bit error with use of CSIRS reported parameters

Regarding thesis details

This work performed at the Indigenous 5G Testbed at IIT Madras is confidential. The original document with complete details is with Prof. Radhakrishna Ganti and can be made available on request.