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Wideband and Tunable Software Controlled Receivers for Emerging Mobile Communication Standards

Title of the dissertation Integrated Radio-Frequency Receivers for RF-to-Digital Converters

Contents of the dissertation The emergence of new mobile communication standards demands a mobile receiver to operate over a wider frequency range with a smaller size and cheaper production costs. This requirement leads to the direction of wideband receivers which are tunable through software-control. This thesis covers the challenges faced towards the implementation of completely integrated software-defined wideband radios. In particular, the thesis covers following research outcomes. First, the thesis details a new technique to implement wideband interferer tolerant on-chip filtering. The technique aims to achieve completely integrated wideband receivers. Second, a novel technique to reduce transmitter signal leakage is implemented for fullduplex reception. Third, blocker rejection and sensitivity issues in a direct delta sigma receiver architecture are analyzed to improve its performance.

Field of the dissertation Micro- and Nanoelectronic circuit design

Doctoral candidate Faizan Ul Haq, MS in Electrical Engineering

Time of the defence 17.10.2019 at 12:00

Place of the defence Aalto University, School of Electrical Engineering, TUAS building, lecture hall TU1 Maarintie 8, Espoo

Opponent Professor Dag T. Wisland, Research group for Nanoelectronic systems, University of Oslo, Norway.

Custos Professor Jussi. Ryynänen, Aalto University, School of Electrical Engineering, Department of Electronics and Nanoengineering.

Electronic dissertation https://aaltodoc.aalto.fi/handle/123456789/53

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A doctoral dissertation is a public document and shall be available at Aalto University, School of Electrical Engineering, Maarintie 8, main hall at the latest 10 days prior to public defense.