

Enabling Ambient Backscatter Using Low-cost Software-defined-radio

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Abstract—Backscatter communication is attractive for energy-constrained devices due to its very low power requirements. Ambient backscatter takes this aspect to the limit by leveraging existing radio frequency signals for the purpose of communication without the need for generating energy expensive carrier signal. In this paper we investigate the use of ambient television broadcast signals for communication. As opposed to state-of-the-art restricted to operations under conditions of strong signal strength, we demonstrate a low cost software defined radio as receiver enables operations even in conditions when ambient signals are weak in strength. We build the system using low-cost off-the-shelf microcontroller, and RTLSDR software-defined radio receiver. We also conduct survey of signal strength of TV broadcast in a mid-sized swedish city, and observe that our system can operate in most parts of the city.

I. INTRODUCTION

This demo file is intended to serve as a “starter file” for IEEE conference papers produced under L^AT_EX using IEEE-tran.cls version 1.8b and later. I wish you the best of success.

mds

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II. BACKGROUND

A. RTL2832U

III. DESIGN

A. Sender

B. Receiver

IV. EVALUATION

A. Signal Strength Variation within the City

B. Signal Strength Variation over Time

C. Communication Performance

V. DISCUSSION

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REFERENCES

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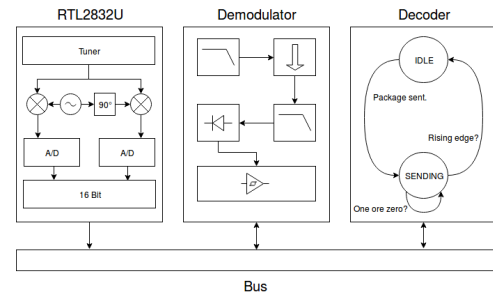


Fig. 1. This figure shows the receiver architecture from an abstract point of view.