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A NEW AUTONOMOUS RADIO ARCHITECTURE FOR DEEP-SPACE TELEMETRY

Abstract

In deep-space telemetry, aircrafts have to communicate with many different transmitters and receivers, so we have to develop new Radio architecture which can receive signals with much less a priori knowledge about its defining parameters; autonomous radio is a proper method to deal with this condition. This article proposes a new autonomous radio architecture that can be used in deep-space telemetry region. This new autonomous radio architecture is designed to communicate with transmitters with different modulations(such as PCM/FMQPSKSOQPSK), symbol rates and carrier frequencies. This new autonomous radio architecture follows three design ideas, firstly, parameter estimators and classifiers have to be independent from the radio receiver architecture, and a mixture judgment method is used in the estimators; secondly, a compatible radio receiver architecture is designed to demodulate different signals; furthermore, a new signal processing schedule is explored to combine the radio receiver and the parameter estimators to lead to an efficient architecture.