

Abstract

Closed-Loop Pseudo-Noise Acquisition Schemes for Direct-Sequence Spread-Spectrum Systems Using Auxiliary Sequences

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This thesis proposes two closed-loop Pseudo-Noise (PN) acquisition schemes for direct-sequence spread-spectrum (DS/SS) systems.

The first scheme is a noncoherent system using an auxiliary signal previously used for coherent acquisition. The proposed scheme consists of a phase alignment detector and a voltage controlled clock (VCC) loop, which is for updating the phase of the local PN signal and the direction of update. Performance of the proposed scheme is evaluated by simulation and compared with that of a conventional noncoherent fixed-dwell serial scheme. Results show that the proposed scheme acquires approximately three to four times faster than the conventional scheme. In addition, the variance of the acquisition time of the proposed scheme is 20 to 40 times smaller than that of the conventional scheme.

The second scheme is a coherent using a new auxiliary signal. It also consists of Phase Alignment Detector and Voltage Controlled Clock (VCC) Loop. The VCC loop uses a new auxiliary signal that provides the loop with two stable locking points. The performance of the proposed scheme is evaluated by simulation which shows that the proposed scheme acquires the phase three and a half to four and a half times faster than the conventional coherent serial scheme.