Project: IEEE P802.15 Interest Group for Wireless Personal Area Networks (WPANs)

Submission Title: Hybrid Rolling Shutter Signal for Optical Camera Communication

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Re:

Abstract: Design of hybrid Rolling Shutter signal for Optical Camera Communication

Purpose: To introduce the feasibility of Hybrid Rolling Shutter signal for Optical Camera Communication

Hybrid Rolling Shutter signal for Optical Camera Communication

Introduction

❑ C-OOK stands for Camera- On Off Keying, a communication mode within the IEEE 802.15.7-2018 Optical Wireless Communication standard. Particularly, C-OOK is within the PHY V layer of IEEE 802.15.7-2018 standard.

❑ Rolling Shutter OFDM scheme was proposed to take advantage of OFDM waveform for high rate OCC system

❑ Hybrid waveform will be proposed by combining two waveforms: C-OOK and OFDM for Vehicular applications. With this scheme, two waveforms will be decoded with just one rolling shutter camera.

Yeong Min Jang

Architecture of Hybrid Rolling Shutter signal for Optical Camera Communication

Transmitter

Slow data stream → FEC Encoder → Insert SN → OOK mapping → Mixer → LED

High data stream → S/P → QAM → Hermitian mapping → DFT → Add Cyclic-Prefix → Mixer

Receiver

Slow data rate ← Remove SN ← OOK decoder ← Preamble detection ← LED detection ← High resolution camera

High data rate ← QAM ← Equalization ← Hermitian mapping ← IDFT ← LED detection
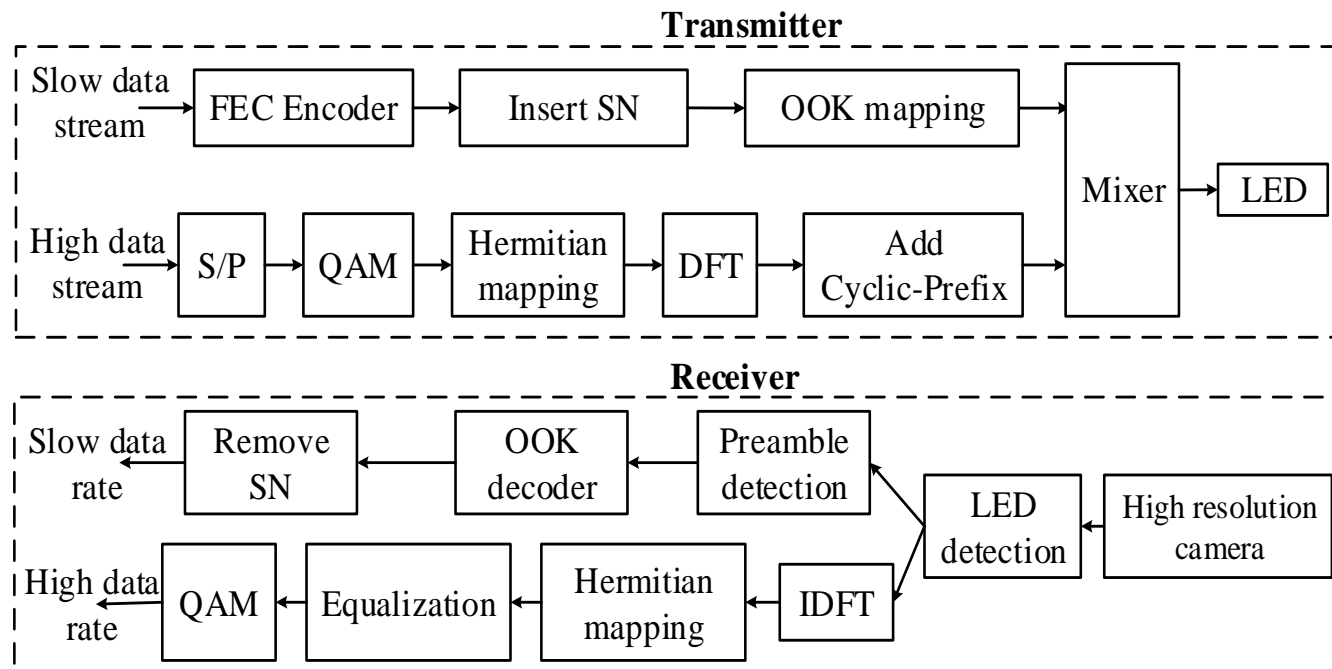
Reference architecture of Hybrid Rolling Shutter signal for Optical Camera Communication

Architecture of Hybrid Rolling Shutter signal for Optical Camera Communication
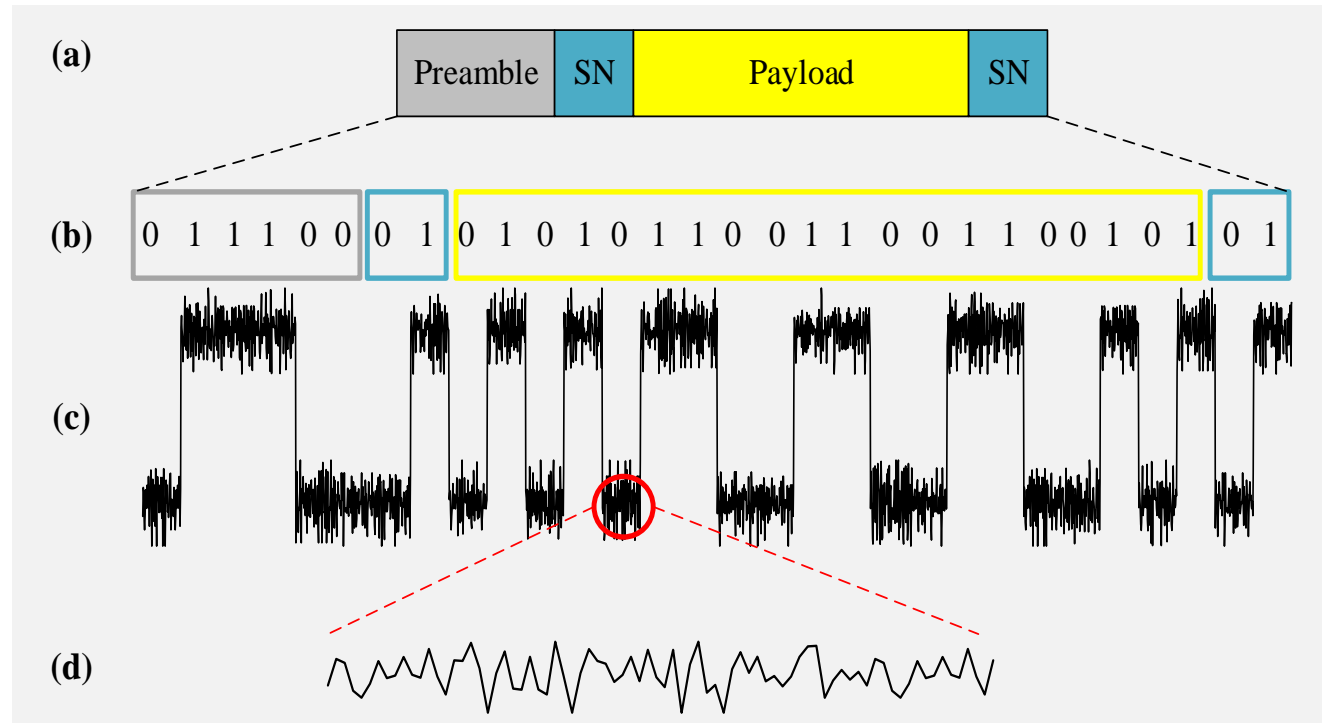
Data frame structure of hybrid OFDM-OOK scheme. (a) OOK packet. (b) OOK data (c) hybrid signal (d) OFDM signal.