University of Huddersfield Repository

Buhafa, Adel M and Sibley, Martin J.N.

Performance of Di-code Pulse Position Modulation Technique in Diffuse Indoor Wireless Optical Communication Systems

Original Citation


This version is available at http://eprints.hud.ac.uk/9342/

The University Repository is a digital collection of the research output of the University, available on Open Access. Copyright and Moral Rights for the items on this site are retained by the individual author and/or other copyright owners. Users may access full items free of charge; copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational or not-for-profit purposes without prior permission or charge, provided:

- The authors, title and full bibliographic details is credited in any copy;
- A hyperlink and/or URL is included for the original metadata page; and
- The content is not changed in any way.

For more information, including our policy and submission procedure, please contact the Repository Team at: E.mailbox@hud.ac.uk.

http://eprints.hud.ac.uk/
In order to evaluate the error probabilities, the output voltage, \( V_o(t) \), and the mean square receiver output noise \( <n(t)^2> \) are required, and these, in turn, depend upon the received pulse shape, the type of preamplifier employed, the associated noise power spectral density, and the type of equalisation filter employed.

DiPPM is a very attractive simple coding scheme for coding and implementation. There are four slots used to transmit one bit of PCM. In diode technique, when the data transitions from logic zero to logic one are coded by positive (+V) and transitions from logic one to logic zero are coded by (±V) and if there is no change in the PCM signal zero pulse is present. However, in DiPPM, as shown in Fig.3.1, two signals SET and RESET are converted into two pulse positions in data frames. If no data transition is present, there is no pulse, while if transitions occur from zero to one or one to zero, there are SET(S) and RESET(R), respectively. If the PCM data is constant, no signal transmitted.

As with digital PPM, DiPPM system suffers from three types of errors, wrong-slot, erasure and false-alarm:

- **Wrong-Slot Errors:** These types of errors occur while the noise presents on the rising edge of a detected pulse, the pulse appears in adjacent time slots, before or after the rent slot.
- **Erasure Errors:** An erasure error occurs when the noise level is larger than the pulse signal and reduces the peak signal voltage below the threshold level, thus giving incorrect detection.
- **False-Alarm Errors:** The false-alarm error occurs when the noise causes a threshold-crossing event in an unoccupied data slot.

DiPPM system over dispersive optical channel using ceiling bounce model. Developed a system mathematical model for this investigation. Analyse a DiPPM system through the use of mathematical models. Illustrate received pulse shape and its slope using MathCAD.