Threshold detection for visible light communication using parametric distribution fitting

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Abstract
Visible light communication has gained widespread attention in recent times and is expected to complement existing network infrastructure such as wireless local area networks, cellular networks as well as power line communications to provide high speed connectivity. The intensity of the received light depends on the intensity and wavelength of the transmitter, wavelength sensitivity range of the receiver, and also on the ambient light. Depending on the intensity of the received light, a photo-sensor has to detect and decode the received data, with minimum probability of error. For binary transmission, this is achieved by choosing a decision threshold. In this paper, a threshold detection mechanism is presented by fitting parametric probability distributions to the sensed signal levels. It is shown that the threshold value obtained using this method yields error probability close to zero.

KEYWORDS
optical wireless communication, parametric distributions, threshold detection, visible light communication, VLC