

**Project: IEEE P802.15.7a OCC TG**

**Submission Title:** Optical Non-orthogonal Multiple Access (O-NOMA) Scheme for OCC System

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**Abstract:** We develop an optical non-orthogonal multiple access (O-NOMA) scheme for OCC system where each LED can transmit two separate signal of two different power levels. An image sensor based receiver system have been designed to capture both the transmitted signal.

**Purpose:** The main goal of this contribution is to overcome the limitation of low range modulation BW in OCC and increase the achievable sumrate.

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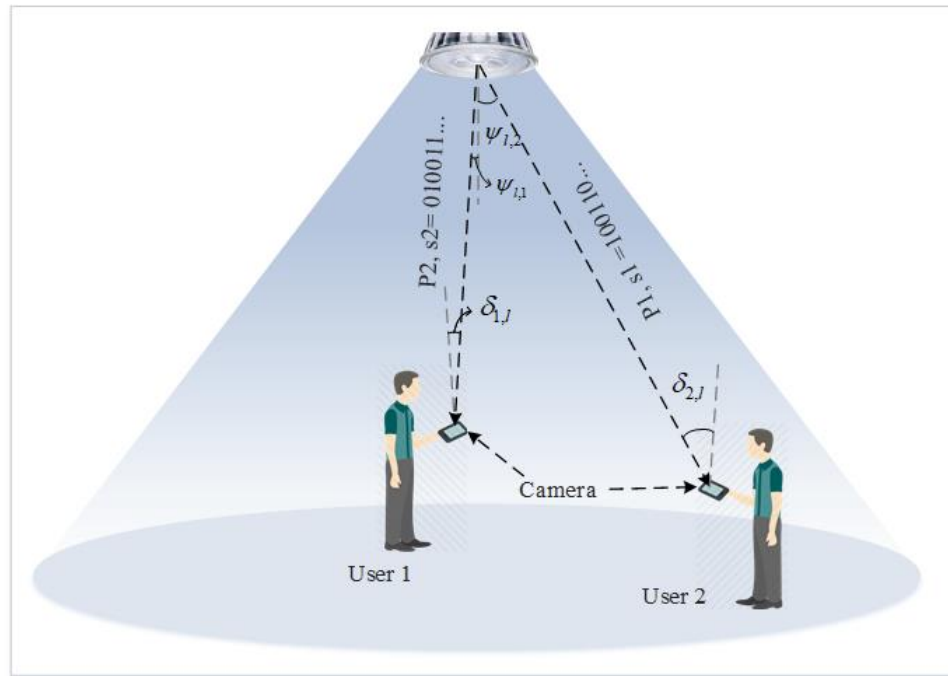
# Introduction

- Optical wireless communication (OWC) is an emerging technology which can provide ubiquitous connectivity by complementing radio frequency communication for the fifth generation wireless communication and beyond [1].
- However, low range modulation bandwidth of light emitting diodes (LED) limits the achievable data rate for camera and LED based OWC. Hence, densely deployed OCC networks, multiple access control is an important issue while supporting massive users. Several MA schemes have been proposed VLC systems to improve maximum throughput and an increasing number of connected channels [2].

# 1. O-NOMA concept

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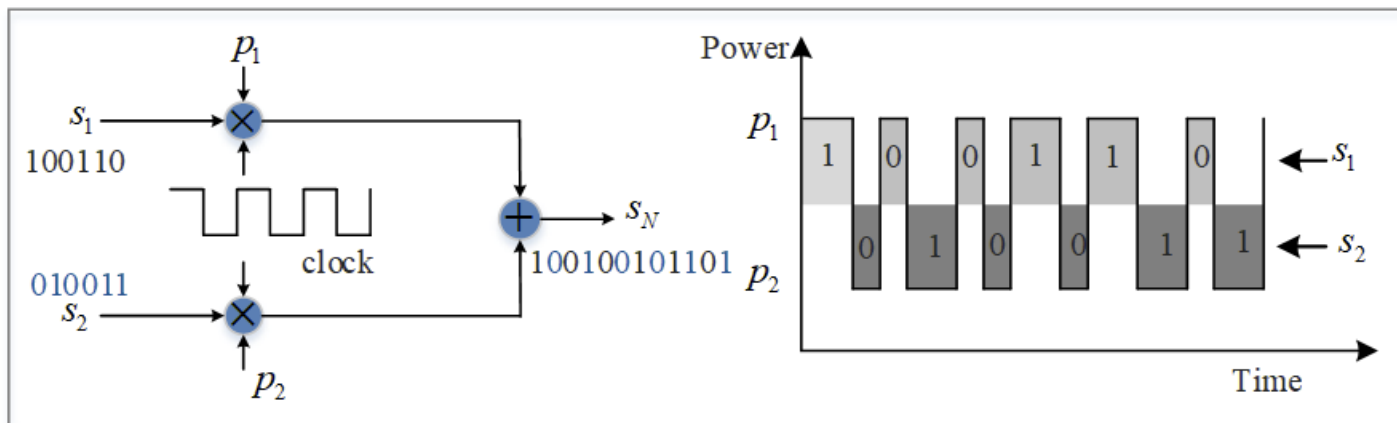
## 1.1 Proposed Idea



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# 1. O-NOMA Concept

## 1.1 LED Data encoding scheme



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# 1. O-NOMA Concept

## 1.1 SIC principle at the receiver



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# References

- [1] M. Z. Chowdhury, M. T. Hossan, A. Islam, and Y. M. Jang, "A comparative survey of optical wireless technologies: architectures and applications," IEEE Access, vol. 6, pp. 9819-9840, January 2018.
- [2] M. Shahjalal, M. M. Islam, M. K. Hasan, M. Z. Chowdhury and Y. M. Jang, "Multiple Access Schemes for Visible Light Communication," 2019 Eleventh International Conference on Ubiquitous and Future Networks (ICUFN), 2019, pp. 115-117.