Using Visible Light Communication in the Smart City context

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Context and goals

➔ Evaluate the performance of VLC in different smart city applicative use cases such as smart objects
➔ Propose a series of smart city services based on VLC
➔ Propose an efficient communication protocol at the MAC layer to take into account the integration of VLC objects

LEDs as Emitter

➔ IM/DD Modulations
  • On-Off Keying
  • Frequency Shift Keying
➔ Driven by cheap MCU

Smartphone as receiver

➔ Camera: CMOS Sensor
➔ Rolling Shutter Effect

Evaluation

➔ LED type & color impact

➔ Illumination impact

➔ Achieved throughput

➔ Angle impact

➔ Packet Loss

➔ PHY Bitrate

➔ Use Cases

➔ Low cost wireless & smart device
➔ Accurate Indoor Localization
➔ Secured Near Field Communication
➔ Contextual Information broadcasting