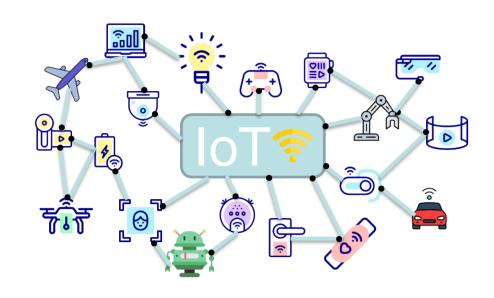
PassiveLiFi Demonstration: Rethinking LiFi for Low-Power and Long-Range RF Backscatter

Dayrene Frometa Fonseca, Muhammad Sarmad Mir, Borja Genoves Guzman, Ambuj Vashney and Domenico Giustiniano

1 - Introduction

- 64 billion internet-of-things (IoT) devices by 2025.
- Most of IoT devices depend on batteries.
- Batteries have a negative environnemental impact.





3 - RF backscatter technology

RF backscatter: Absorb and reflect RF carriers to transmit data with extreme low-power

2 - LiFi Technology

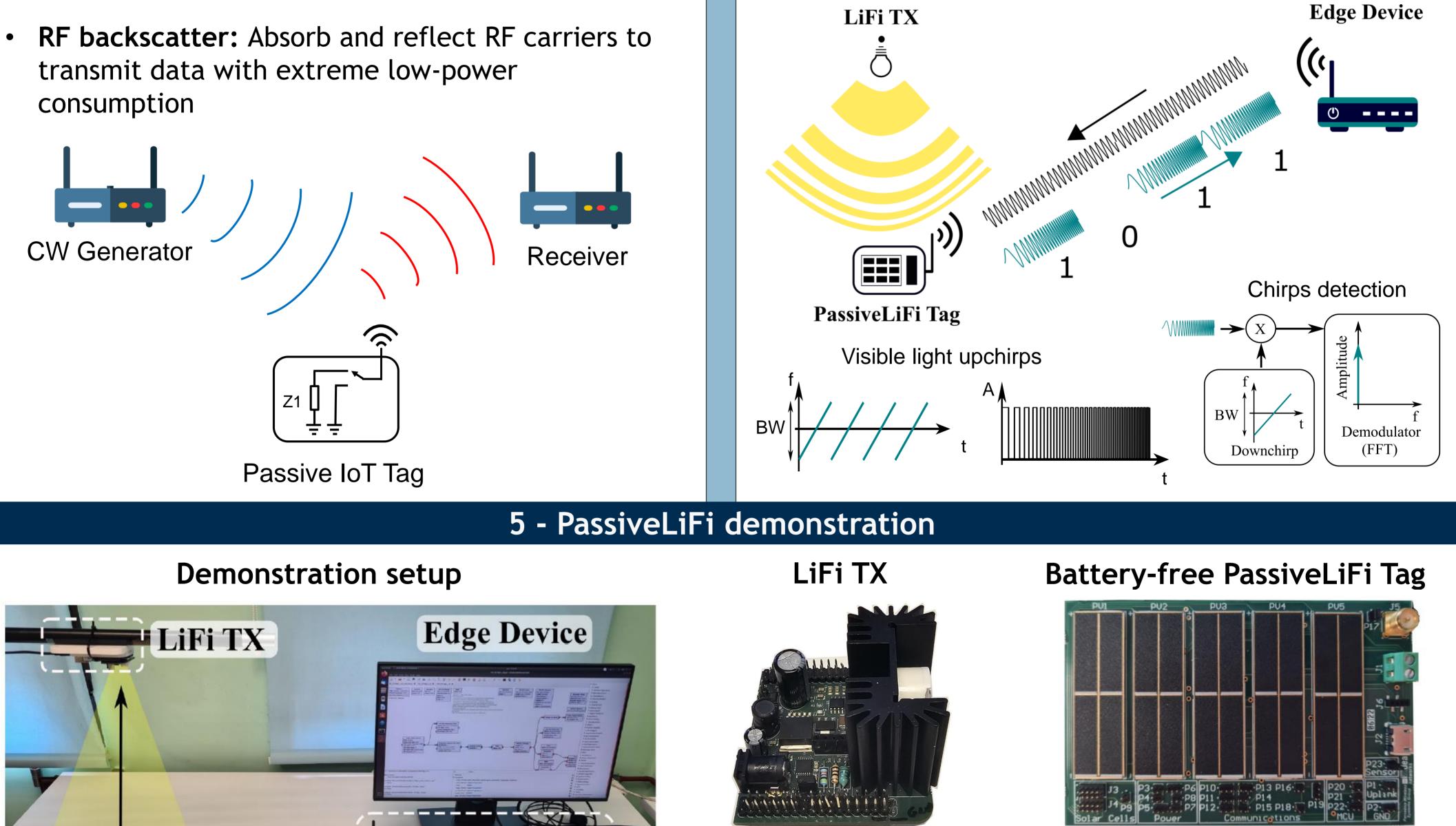
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Simultaneous illumination and communication with LEDs



4 - PassiveLiFi system overview



Upchirp parameters:

- Spreading factor •
- Power consumption: few µW
- Communication range: up to





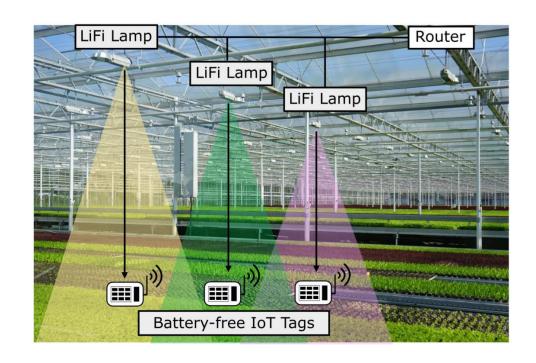
Bandwidth

300 m outdoors

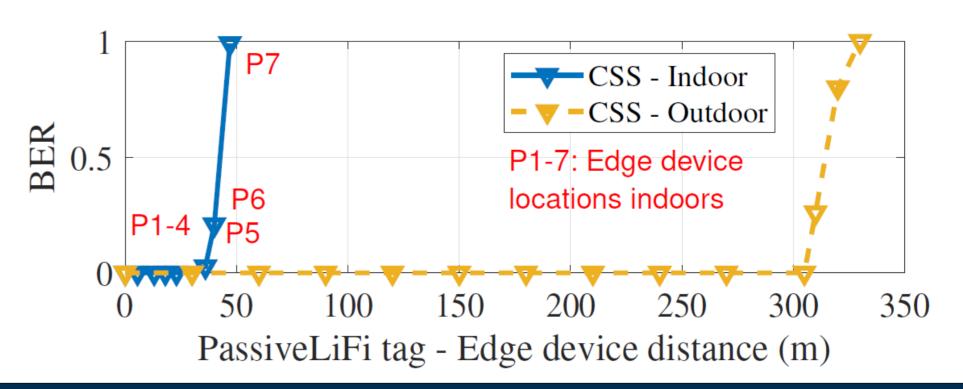
6 - Applications

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7 - Results



- Precision agriculture indoors
- Industry 4.0
- Smart homes



References

M. Mir, B. Genoves, A. Varshney, D. Giustiniano, "PassiveLiFi: Rethinking LiFi for Low-Power and Long Range RF Backscatter", ACM Mobicom 2021. A. Galisteo, D. Varshney, D. Giustiniano, "Two to Tango: Hybrid Light and Backscatter Networks for Next Billion Devices", ACM Mobisys 2020.

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