ARIA
APPLIED RESEARCH IN ACTION

Project Li-Tooth: Scalable, High-Bandwidth Optical Information Broadcast for Spatial Computing

Space aware, line-of-sight data broadcast using VLC/OCC hybrid

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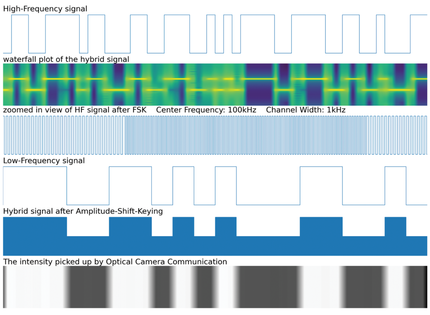

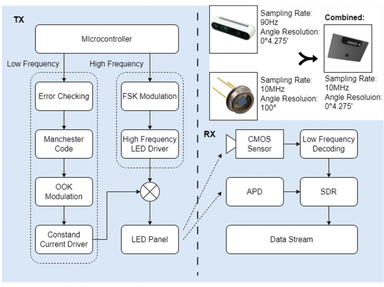

PROJECT SUMMARY

In a future dominated by mixed reality systems and intelligent agents, there's a crucial need for seamless information exchange across multiple devices. Traditional wireless protocols like Bluetooth, WIFI, LoRa, etc fall short of providing smooth pairing, unpairing, and zoning capabilities due to signal bleed and complex network infrastructures.

Visible Light Communication (VLC)has been suggested as a promising alternative to radio-frequency (RF) communication, offering solutions for indoor positioning and data broadcasting challenges. However, VLC faces issues like the need for a secondary communication modality, limited device count, and spatial awareness limitations.

Our innovative approach pairs two optical sensor modalities: high-speed photodiodes for temporal resolution and traditional cameras for spatial resolution. Transmitters use common LEDs with hybrid modulation to target different modalities, resulting in a system with key benefits:

- Decoding information from multiple transmitters simultaneously.
- Secure and zoning-friendly optical communication.
- No need for pairing.
- Cost-effective transmitter with minimal resources.
- Built with readily available components.

The VLC/OCC hybrid model from Project Li-Tooth can potentially transform spatial computing and communication systems at large, addressing VLC's limitations and enabling intricate spatial computing applications. Explore our live demo to see it in action.

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