Demo: A Robust Barcode System for Data Transmissions over Screen-Camera Links

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Abstract:

With the rapid proliferation of camera-equipped smart devices, visible light communication (VLC) over screen-camera links emerges as a novel form of near-field communication, and it offers a user-friendly, infrastructure-less and secure communication. However, the limitations of smart devices and the uncertainty of user behaviors seriously hinder its applicability. Hence, we designed RDCode, a novel barcode system proposed to boost the throughput over screen-camera links, by making use of a novel layered barcode design and several effective coding techniques to enhance the transmission reliability. We implemented a file transmission app on Android platform based on our work. The transmission rate can be up to 20KB/s.

![Data transmission over screen-camera links](image)

### A layered barcode layout

We designed a novel packet-frame-block barcode layout, such that a packet comprises a sequence of frames, each of which further consists of a set of independent blocks.

![Barcode layout](image)

### Adaptive symbol extraction

Our adaptive symbol extraction methods can locate available distributed locators even if a portion of the barcode is unavailable. Moreover, many practical problems in screen-camera links such as distortions and color inaccuracies can be alleviated.

### Data protection techniques

Based on the observation of the error distribution, we apply three different error correction codes on blocks, frames and packets respectively. We also add a short sequence number in each block to guarantee the data ordering.

**References**