Color Barcodes for Mobile and Other Applications

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Printed documents continue to play an important role in our day to day lives despite our ever increasing electronic interactions. Techniques that allow data to be embedded and automatically extracted from printed documents enable effective interfaces with the electronic world and facilitate applications in mobile computing, document security, and workflow automation. In recent years, barcodes for mobile phone applications have emerged as a key application in this domain. In this talk, we present our recent work, which, within a common framework, extends several barcode technologies to color, thereby enhancing their capabilities. Specifically, our framework intelligently exploiting the “spectral diversity” inherent in color printing and color image capture along with model based estimation and cancelation of cross-channel interference to provide an almost three-fold increase in data capacity without compromising robustness against common degradations including tonal variations in printing and scanning and geometric distortions in mobile image phone capture. For mobile applications, we demonstrate our methodology by using the ubiquitous Quick Response (QR) codes and Aztec codes common in ticketing applications. We outline new applications that these higher rates facilitate and describe continuing directions for this work.

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