Camera-Based Reader for Blurry and Low-Resolution 1D Barcodes

Tech ID: 25466 / UC Case 2009-658-0

BACKGROUND

Virtually every item on the market today is labeled with at least one form of barcode, generally a flavor of either the EAN or the UPC standards. The success of barcode technology for identification, tracking, and inventory derives from its ability to encode information in a compact fashion with very low costs associated.

Barcode reading via dedicated scanners is a mature technology. Commercial laser-based hand-held barcode scanners achieve robust readings. Recently, however, there has been growing interest in accessing barcodes with a regular cellphone, rather than with a dedicated device. Since cellphones are of universal use, this would enable a multitude of mobile applications. For example, several cellphone apps have appeared recently that provide access via barcode reading to the full characteristics of and user reviews for a product found at a store.

Unfortunately, cellphone camera images are generated by low-grade lenses which produce blurred barcode images. Also, motion blur and noise can be expected with low ambient light. These factors, possibly combined with low image resolution, make barcode reading challenging in some situations.

TECHNOLOGY DESCRIPTION

Researchers at the University of California, Santa Cruz, have created a new algorithm for barcode reading. The algorithm produces excellent results, even for images that are blurred with low resolution, and from pictures taken with a weak phone camera. A unique characteristic of the algorithm is that it doesn't require binarization of the image or perform edge extraction operations. Thus, it circumvents a critical and often error-prone early-commitment procedure. Existing algorithms for barcode reading perform some sort of binarization of the input brightness data. This early-commitment operation translates into unrecoverable information loss, making the reader susceptible to noise, blur, and low resolution.

Experimental results show improved performance with respect to other state-of-the-art software and algorithms, especially under the most challenging of conditions. The enhancements offered by this algorithm would be particularly useful for low resolution imagery, where even a small amount of blur may completely wash out the narrower bars.

APPLICATIONS

- Barcode reading using cellphone camera images

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INVENTORS

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OTHER INFORMATION

KEYWORDS

Cell phone camera, camera reader, barcode, EAN, UPC, Cat4

CATEGORIZED AS

- **Imaging**
  - Other
  - Software

RELATED CASES

2009-658-0

ADVANTAGES

- Significantly enhanced performance and accuracy

INTELLECTUAL PROPERTY INFORMATION

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,098,764	08/04/2015	2009-658

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Using Virtual Tile Routing For Navigating Complex Transit Hubs
- Methods and Systems for Annotating Floorplans
- Inertial Odometry System and Methods

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