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EE368 Image Analysis Final Project Proposal

Image-based retrieval of chemical safety and ordering information

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Proposal

(This project will require a DROID camera phone)

In this project, we will implement an Android application that aims to automate retrieval of material safety data sheets (MSDS) and product ordering information in a laboratory environment. The information will be retrieved from the photograph of a product label that the user will take using his or her phone's camera.

The primary target users of our application are scientists who wish to look up reagent safety and product ordering information in a quick and convenient manner. Access to reagent safety information, however, is important to other users as well. For instance, a farmer may wish to look up safety information on an unfamiliar pesticide.

The project will include the following modules:

1. User interface: display of photograph, product safety and ordering information
2. Image correction: orientation, illumination, and flattening
3. Information extraction: text recognition and classification
4. Information retrieval and delivery: web search search and e-mail delivery

We will apply the following image processing techniques to implement the functions of our application:

1. Perspective and Curvature Correction [3]
2. Uneven Illumination Correction via local thresholding using Otsu's method
3. Optical Character Recognition using Tesseract Engine [1]

Related work

Our project shares similarities with a 2010 EE368 project where Bhaskar, Lavassar, and Green [2] implemented a business card reader. There are at least two key differences in the image and information processing methods we will attempt to implement. Firstly, in addition to rectifying perspective distortion, our algorithm will need to rectify curved text. Second, we will have to develop an algorithm that selects only meaningful key words from the extracted text (Fig. 1). This is not necessary in a business card reader because the type of information found in a card does not vary much across samples.

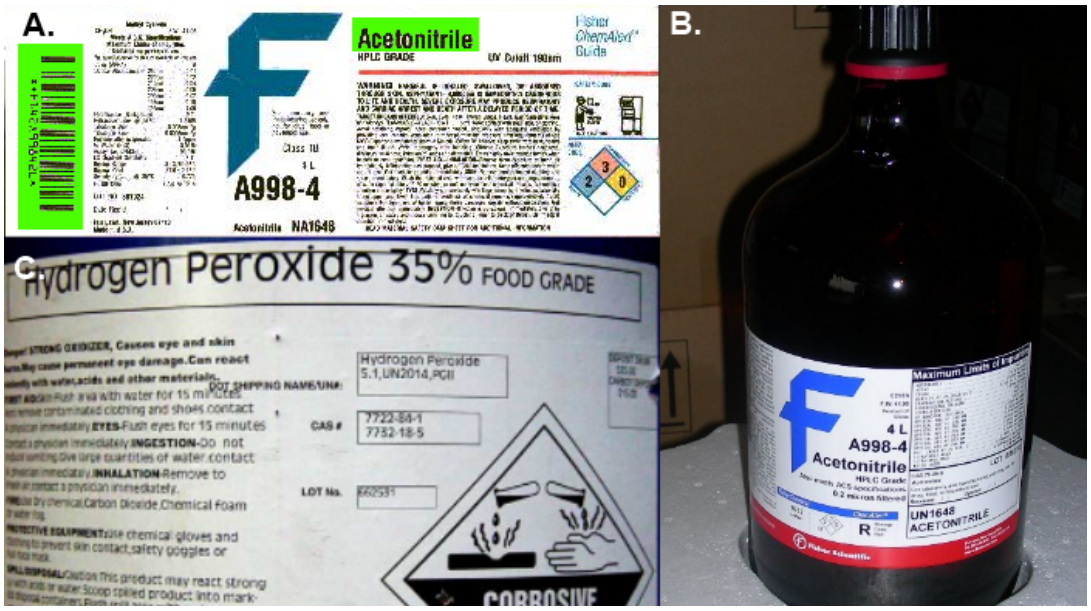

Figure 1: **A.**:Generic label, without distortion or uneven illumination. Possible sources of chemical identification information are highlighted in green. **B. & C.** Examples of low quality photographs of chemicals that have uneven illumination, distorted text and interfering lines.

References

1. In ICDAR '07: Proceedings of the Ninth International Conference on Document Analysis and Recognition (ICDAR 2007) Vol 2 (2007), pp. 629-633
2. Bhaskar, Sonia, Nicholas Lavassar, and Scott Green. Implementing Optical Character Recognition on the Android Operating System for Business Cards. EE368: Digital Image Processing. Stanford University. Web. 1 May 2012.
3. J. Liang, et. al. “Geometric Rectification of Camera-captured Document Images,” IEEE Transactions on Pattern Analysis and Machine Intelligence, pp. 591-605, July 2006