Project: Object recognition for coins calculation

Description:

The coin calculation system can identify coins inside images captured using a phone camera, differentiate each coin and calculate the total value of money. This system consists of: some new coins, white background paper, phone camera, phone/PC connection cable and PC.
Figure 1 shows an example of calculation system which discovers one piece of 2 Euros, one piece of 1 Euros, one piece of 50 cents, 2 pieces of 20 cents, 1 piece of 10 cents, and 1 piece of 5 cents (total money value: 4.05 Euros).

Figure 1: Coins Example (total: 4.05 Euros)

Objectives:

- Understand and experience the image processing methods (filters, segmentation, etc...) provided in course syllabus.
- Improve your programming skills and GUI designing capabilities in MATLAB.
- Test the algorithm with different cases of coin images.
- Study image problems (noise, blurring, brightness, etc...) and introduce possible improvements.

Output:

The work involved the design and development of recognition and calculation for euro coins. The development must be done in MATLAB. You will need to make a report (in French or English) in PDF format.

The report (at most eight pages) should include:

- Maximum one page: introduction of the project and dataset description.
- Maximum two pages: explaining in details your final methodology and discussing the reasons of choosing it (diagrams should be provided for clarification).
- Maximum two pages: showing the experimental results (quantitative and qualitative outputs), the status of completion of the application, functions that have been completed, those that are not finalized, and the remaining bugs.

- Maximum two pages: list of all your MATLAB processing functions (not GUI ones). For each one, give the short description of the function and its input and output parameters (it can be the comment part of the .m file containing the function declaration).
- Maximum one page: references of publications, technical reports and web-pages representing the related project work.

Project Delivery:

The project (report + source codes + dataset) is submitted no later than 20th January 2018 - 23:59:59 (local time). It will be placed on the portal based on your group of TP. The name of the attached file containing the names of your group and the group name of TP (Name1-Name2-TPA.zip)

Organization:

The project should be mandatory in pairs. When the number students from a group of TP is odd, a student must work alone (you can have one student working alone).

Four TP sessions are provided for assistance in developing the project, but it is also necessary to work outside of these sessions. The sessions are as follows:

- 3 hours session of project introduction, dataset acquisition and image calibration.
- 3 hours session of maintaining of pre-processing and segmentation steps.
- 3 hours session of developing post-processing and classification steps.
- 3 hours session of finalizing application with GUI.

All technical questions should be asked during TP sessions.

Evaluation:

- Evaluation of the report (30%)
- Application functionality (25% during sessions and 25% final stage)
- Evaluating source codes and executable files (20%)

Penalties:

If the project is delivered late or missing documents, a penalty (10% of score) will be applied per day of delay.