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Automated identification system for student assignment cover pages

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Student assignments are a major part of the teaching and learning process in most universities and higher educational institutes. Similar to the other universities, many assignments are carried out by students attached to the Open University of Sri Lanka (OUSL). However, difficulties are sometimes experienced by the students in submitting the assignments for assessment due to restrictions related to handing over during the specified period for submission.

Therefore, a study was conducted with the objective of minimizing the difficulties that occur due to the existing assignment submission and sorting processes at OUSL. The Faculty of Humanities and Social Sciences (HSS) was selected to conduct the study. At the Faculty of HSS, the students assignments are (manually) collected, student details are recorded and receipts are issued to students, which is a time consuming process that can usually be conducted during regular working hours. It has become evident that an automated cover page identification system could be effectively used to expedite the assignment submission process.

In order to introduce an automated identification system, a unique cover page is an essential requirement. The study on the automated system was focused mainly on identification of the documents which are assignment cover pages as it provided a facility for the sorting process. This process included an image processing based Optical Mark Recognition (OMR) system. In OMR technology, the sheet design is one of the most important parts of the system as the performance depends on the characteristics of the OMR sheet type. In the design process of the cover page, a standard OMR sheet design technique was used. The designed cover page consisted of cages to mark the relevant details of the assignment cover page such as student registration number and course code. In the identification process, the image extraction was done to obtain information easily using image processing techniques. For the image processing feature extraction, an open CV software was used. Before the feature extraction, the noise of the image was removed, dilated and filtered. After the feature extraction of the captured image, the algorithm to identify information included in the cover page was processed. For this purpose, blob detection was used. After detecting the boundaries of the marked positions, the proposed system detects centroids of each mark. The centroids can vary on some specific range as they are marked by users within a cage provided and the marks within such cases are to be identified.

The identified values, such as student registration number and course code are sent to a database to compare with pre-entered details of the students. If identified values match the database values, then the system will identify it as a valid assignment cover page and, if not, an error message will be displayed. For assignments identified as valid, the student will get the feedback on a receipt which is generated with the information provided by the database. It is expected that with the introduction of the automated system, many of the difficulties related to assignment submissions experienced by students will be eliminated.

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