

CURRENCY VALIDATION

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a method and system for devising a template for validating currency. The invention also relates to a method and system, in particular a self-service system such as an automated teller machine, for automatically validating or authenticating currency.

[0002] Banks and financial institutions have an increasing need to provide their customers with an expanding range of high standard financial self-services. The most popular and well-established service currently available is the Automatic Teller Machine (ATM). At present, ATMs are primarily used to allow customers to access personal financial information and to dispense cash. However, there is an increasing requirement to provide secure deposit transaction capabilities to complement these traditional ATM services.

[0003] Although some ATMs that can accept cheque and banknote deposits are available, only a limited number of these allow the validation and confirmation of the authenticity of the enclosed currency or cheques to be completed by the ATM. Instead, more generally, bank personnel have to manually confirm the validity of the deposit before completing the transaction and, in the case of a cash deposit, authorizing the re-circulation of the banknotes. For cash deposits, this is a problem, because it means that there is often a significant delay between receipt of the banknotes at the ATM and re-circulation of these notes.

[0004] Automated currency verification and validation systems for incorporation in ATMs have been proposed, and indeed some are currently available. The aim of these is to allow deposited banknotes to be verified and validated within an ATM and then re-circulated as part of the withdrawal service of that same ATM. However, a fundamental danger of automated currency validation is the possibility of utilizing a currency recycling facility within ATMs as a means of circulating counterfeit currency.

[0005] At present, in order to validate currency classical pattern recognition techniques are used. For these to be effective, a representative sample of both genuine and counterfeit currency has to be available to devise discriminator templates. All other notes are compared with these discriminator templates. Notes that are identified as genuine are accepted. All other notes, such as counterfeits or defaced genuine notes or unknown notes, are rejected. In current systems, the templates are prepared manually by the observation of collected data and by putting more emphasis on some of the data than others. However, this handcrafted template approach is very time consuming and costly, and prevents rapid reaction to new counterfeits. Manufacture of the templates is done centrally, which requires the movement of data or notes and the use of an expert craftsman to carry out the work. This means that the templates can take several weeks to prepare, which in turn means that there is a delay between issuance of new currency, and the inevitable new counterfeits, and a validation mechanism for banks.

SUMMARY OF THE INVENTION

[0006] An object of the invention is to provide method for devising a template for a document such as a cheque or banknote that has to be validated.

[0007] Another object of the invention is to provide an improved method for verifying and validating such documents, and in particular banknotes.

[0008] According to a first aspect of the present invention, there is provided a method for creating a template for a document, such as a banknote, that has to be validated, the method comprising using a scanner or imager to capture images of a plurality of reference documents, such as banknotes, and using the captured images to define a reference template. By template it is meant a representation of the reference images, which typically is a numerical or statistical representation of those images.

[0009] By using a plurality of scanned images of genuine documents to define a template, there is provided a very simple and effective method for dynamically creating a reference template that can be used in later validation processes. Because the template is built up merely by scanning images of genuine notes, there is no need for expert intervention in the manufacture of the template. This means that reference templates can be generated quickly and cheaply when new currency is introduced.

[0010] The imager or scanner may be an optical or thermal or magnetic imager or scanner. As one example, the imager may comprise a plurality of light sensors, preferably each being sensitive to a different color. In this case, the image may be represented by color differences. Here, the template would be a representation of the distribution of optically measured color differences within the inks that cover the document. This is particularly useful for banknotes. In a preferred embodiment, four different sensors are provided and the image is represented by a six dimensional vector, each dimension of the vector being indicative of differences in intensity between signals received at two of the four sensors. The imager or scanner could be included in a self-service terminal so that the template can be determined locally as and when desired. Alternatively, the imager or scanner could be provided in a secure area of a bank for use by bank personnel.

[0011] The method may further involve segmenting each image in a like manner into a plurality of segments, and using like segments of the images to determine a reference segment or reference segment parameter for each segment. By using or comparing like segments of each of a plurality of images of genuine documents, it is possible to build up a segmented reference image that can be used in a subsequent validation technique.

[0012] Preferably, the step of using the segments of the images involves determining a reference classification parameter for each segment; and defining a threshold for the reference classification parameter. By defining a threshold value for the reference classification parameter or range of such parameters for each segment of the genuine note, it is possible to determine whether other test notes of unknown status are genuine by determining classification parameters for segments of the test note and comparing these with the threshold for the reference classification parameters. An advantage of doing this is that by varying the threshold value for the classification parameter, there is provided a very simple way for changing the acceptable margin of error. In the banking environment, this is useful, because it allows banks flexibility in setting how many counterfeit notes they would be prepared to accept and likewise how many valid notes they would be prepared to reject.