

Canon Kabushiki Kaisha

"Information Processing Apparatus, Control Method for Information Processing Apparatus and Storage Medium" in Patent Application Approval Process

2013 APR 4 (VerticalNews) -- By a News Reporter-Staff News Editor at Politics & Government Week -- A patent application by the inventors Yamanaka, Masao (Tokyo, JP); Matsugu, Masakazu (Yokohama-shi, JP), filed on March 15, 2012, was cleared for further review on March 21, 2013, according to news reporting originating from Washington, D.C., by VerticalNews correspondents. Patent serial number 421278 is assigned to Canon Kabushiki Kaisha. The following quote was obtained by the news editors from the background information supplied by the inventors: "The present invention relates to an information processing apparatus, a control method for the information processing apparatus, and a storage medium and, more particularly, to an information processing apparatus which executes region segmentation of an image, a control method for the information processing apparatus, and a storage medium. "An image is divided into regions, and the region segmentation result is applied to various image processing applications. For this purpose, a technique for appropriately dividing an image is demanded. As an appropriate region segmentation method of an input image, a method described in X. Ren, J. Malik, 'Learning a classification model for segmentation', Proc. IEEE International Conference on Computer Vision, pp. 10-17, 2003. has been proposed. X. Ren, J. Malik, 'Learning a classification model for segmentation', Proc. IEEE International Conference on Computer Vision, pp. 10-17, 2003. discloses a technique of attaining region segmentation of an image by expressing an image by a data structure called a graph and reducing that structure to an energy minimization problem. "Also, as another appropriate region segmentation method of an input image, a method described in L. Chen, 'The lambda-connected segmentation and the optimal algorithm for split-and-merge segmentation', Chinese J. Computers, 14 (1991), pp. 321-331 has been proposed. L. Chen, 'The lambda-connected segmentation and the optimal algorithm for split-and-merge segmentation', Chinese J. Computers, 14 (1991), pp. 321-331 discloses a technique for attaining region segmentation by combining segmentation and integration of an image. With this technique, an image is recursively divided into small partial regions until low-order feature amounts in a predetermined region have uniform properties during a division process, and these partial regions are integrated to be grown to polygons in an integration process, thus attaining region segmentation of an image. "However, in case of the region segmentation method based on the graph theory like in X. Ren, J. Malik, 'Learning a classification model for segmentation', Proc. IEEE International Conference on Computer Vision, pp. 10-17, 2003, a problem of an increase in computation volume is posed. Also, in case of the region segmentation method based on the split & merge method like in L. Chen, 'The lambda-connected segmentation and the optimal algorithm for split-and-merge segmentation', Chinese J. Computers, 14 (1991), pp. 321-331, a method of stably judging whether or not low-order feature amounts in a predetermined region have uniform properties during the division process has not been established yet, and precise region segmentation cannot be attained. Also, as in X. Ren, J. Malik, 'Learning a classification model for segmentation', Proc. IEEE International Conference on Computer Vision, pp. 10-17, 2003, a problem of an increase in computation volume is posed." In addition to the background information obtained for this patent application, VerticalNews journalists also obtained the inventors' summary information for this patent: "In consideration of the aforementioned problems, the present invention provides a technique for shortening a processing time required for region segmentation of an image. "According to one aspect of the present invention, there is provided an information processing apparatus comprising: a setting unit configured to set a plurality of local regions on an image; an extraction unit

configured to extract feature amounts from the respective local regions; a calculation unit configured to calculate dissimilarities between the local regions based on probability densities for the respective feature amounts; and an integration unit configured to integrate the plurality of local regions as region groups based on the dissimilarities. "According to one aspect of the present invention, there is provided a control method for an information processing apparatus, comprising: setting a plurality of local regions on an image; extracting feature amounts from the respective local regions; calculating dissimilarities between the local regions based on probability densities for the respective feature amounts; and integrating the plurality of local regions as region groups based on the dissimilarities.

"Further features of the present invention will be apparent from the following description of exemplary embodiments with reference to the attached drawings. BRIEF DESCRIPTION OF THE DRAWINGS "FIG. 1 is a block diagram showing the functional arrangement of an information processing apparatus according to the first embodiment; "FIG. 2 is a view for explaining the function of a local region setting unit 11 of the information processing apparatus according to the first embodiment; "FIG. 3 is a view for explaining the function of a dissimilarity calculation unit 13 of the information processing apparatus according to the first embodiment; "FIG. 4 is a view for explaining the function of a local region integration unit 14 of the information processing apparatus according to the first embodiment; "FIG. 5 is a view for explaining the function of the local region setting unit 11 of the information processing apparatus according to the second embodiment; "FIG. 6 is a view for explaining the function of the dissimilarity calculation unit 13 of the information processing apparatus according to the second embodiment; "FIG. 7 is a view for explaining the function of the dissimilarity calculation unit 13 of the information processing apparatus according to the second embodiment; "FIG. 8 is a view for explaining the function of the dissimilarity calculation unit 13 of the information processing apparatus according to the second embodiment; and "FIG. 9 is a view for explaining the function of the dissimilarity calculation unit 13 of the information processing apparatus according to the second embodiment." URL and more information on this patent application, see: Yamanaka, Masao; Matsugu, Masakazu. Information Processing Apparatus, Control Method for Information Processing Apparatus and Storage Medium. U.S. Patent Serial Number 421278, filed March 15, 2012, and posted March 21, 2013. Patent URL: <http://appft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&u=%2Fnetacgi%2FPTO%2Fsearch-adv.html&r=3171&p=64&f=G&l=50&d=PG01&S1=20130314.PD.&OS=PD/20130314&RS=PD/20130314> Keywords for this news article include: Algorithms, Canon Kabushiki Kaisha. Our reports deliver fact-based news of research and discoveries from around the world. Copyright 2013, NewsRx LLC

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dissimilarities. "Further features of the present invention will be apparent from the following description of exemplary embodiments with reference to the attached drawings.

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