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Object Tracing Using Fast Fourier Transform

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ABSTRACT – Detection and recognition of textual information in an image or video sequence is important for many applications. The increased resolution and capabilities of digital cameras and faster mobile processing allow for the development of interesting system . The Fourier transform of functions varying with time, often presents interesting information on the frequency content of the phenomena. In order to detect numbers in an image, a simple and effective method is used. Here first the number is represented in 8x8 matrix format. Then the fourier transform was taken for that by using Cooley–Tukey algorithm using radix2 . Then for comparing between two numbers, the Cross Correlation Coefficient was taken.

KEYWORDS*:* Number representation – 8x8 matrix format – taking Fourier Transform – Cross Correlation, number recognition

I. INTRODUCTION

Nowadays the volume of data contained in images or video files make necessary to create useful tools, which allow extracting

information from these files without human supervision. Contents can be perceptual, such as colour, shapes, textures, etc., or semantic, such as objects, text or events and its relationships. The perceptual ones are easier to analyze automatically while the semantic are easier to handle linguistically. Caption or super imposed text is a semantic content whose computational cost is lower than the cost of other semantic contents. Due to the fact that usually text is synchronized and related to the scene, its extraction becomes a useful feature providing very relevant information for the semantic analyze. Although text is easily detectable for humans, there are no methods allowing its extraction in any kind of image. This is due to the fact that there is a wide range of text formats (size, style, orientation etc.), the low resolution of the images (quality) and the complexity of the background. Despite these facts, text lines present some homogeneity features, which make it detectable.Therefore, the aim of this paper is to provide a initial step in text detection and number detection.

A. Tracing Numbers

Much research work has been carried out in the area of text and number detection and localization in both, images and video. Therefore, for a better understanding of the different methods, the main character features are described. Although hardly ever all of them are taken into account in the same method, some of them, such as contrast or colour homo geneity, are always present. Some of the main caption text features are the following:
Contrast between text and background – Contrast is an important feature since in most images text must be readable, it cannot be blurred or occluded. Very often a high contrast is required as well as a steady brightness. Spatial cohesion – All the features included in this point are related with geometric aspects. Textured appearance – The two previous features, contrast and spatial cohesion, can cause that the text detection turns into texture segmentation. Considering text as a whole entity, it has enough features to be detectable as a texture. Mismatching problems can appear when image textures and text features are very similar, like the leaves of a tree. Strokes thickness and its density – It contributes to the textured appearance of the text because stroke is almost ever uniform. Thickness usually remains constant, except for some typography. Other attributes related to stroke are its number in the character and its density.

B. Fast Fourier Transformation

A principal analysis tool in many of today's scientific challenges is the Fourier Transform. The Fourier Transform is essentially a universal problem-solving technique. Its importance is based on the fundamental property that one can examine a particular relationship from an entirely different viewpoint. Simultaneous visualization of a function and its Fourier Transform is often the key to successful problem solving.

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$$r = \frac{\sum_i [\,(x(i) - mx) * (y(i-d) - my)\,]}{\sqrt{\sum_i (x(i) - mx)^2}\sqrt{\sum_i (y(i-d) - my)^2}}$$

Fourier Transform has the ability to examine a function or waveform from the perspective of both the time and frequency domains. The Fourier Transform defines a relationship between a signal in the time domain and its representation in the frequency domain.

The standard strategy to speed up an algorithm is to divide and conquer.

$$r(d) = \frac{\sum_i [\,(x(i) - mx) * (y(i-d) - my)\,]}{\sqrt{\sum_i (x(i) - mx)^2}\sqrt{\sum_i (y(i-d) - my)^2}}$$

The Fast Fourier Transform is used to find the Fourier Transform using that method. The terms in the following equation are rearranged in some manner.

V[k] = Σn=0..N-1 WNkn v[n]

The odd numbers are separated from the even numbers.

The Fast Fourier Transform (FFT) is a fundamental problem-solving tool in the educational, industrial, and military sectors. The FFT is simply an algorithm that can compute the discrete Fourier Transform much more rapidly than other available algorithms.

C. Cross Correlation Coefficient

Cross correlation is a standard method of estimating the degree to which two series are correlated. Consider two series x(i) and y(i) where i=0,1,2...N-1. The cross correlation r at delay d is defined as

Where mx and my are the means of the corresponding series. If the above is computed for all delays d=0,1,2,...N-1 then it results in a cross correlation series of twice the length as the original series.

There is the issue of what to do when the index into the series is less than 0 or greater than or equal to the number of points.

II. RELATED WORK

FROM FFT TEXT DETECTION1 Those methods that work with the pixel values and positions are called methods in the spatial domain and
they can be classified according to the following image features:

Edge-based [1],[2],[6] and [21]. Methods in this group are focused in the search of those areas that have a high contrast between text and background. In this way, edges from letters are identified and merged.

Once these regions are recognised, spatial cohesion features are applied in order to discard false positives.

Connected Components-based [13] and [15]. These methods use a bottom-up approach by iteratively merge sets of connected pixels using a homogeneity criterion leading to the creation of flat-zones or Connected Components (CC). At the end of the iterative procedure all the flat-zones are identified. Also in this case spatial cohesion features are applied.

Both edge-based and CC-based methods could be included under the same group, region-based methods.

Texture-based [8],[10],[12],[25] and [26]. In this group we can include many of the existing methods:

they use the property that text in images has distinct textural characteristics that distinguish them from the background. For example, those methods which use the Gabor filter [8], Gaussian filter [26] or those based on the colour and shape of the regions [25] and [10]. If we had not classified into spatial and compressed domain, those methods based on wavelet or FFT would accomplish this textural properties.

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Correlation-based [24]. These methods are those that use any kind of correlation in order to decide if a pixel belongs to a character or not. Others [22]. All the methods that have been mentioned don't use temporal information or use it as a complementary tool. In [22], temporal information is the main feature. After applying a shot detection technique, for each image pixel a vector collects its temporal value along a fixed number of frames. The authors prove that, computing the PCA for each vector, feature vectors related to the background can be separated from those related to text. The main problem of this method is that it only can be applied when the sequence has static text and a moving background.

REFERENCES

1. Kalaiprasath, R; Elankavi, R; Udayakumar, R; , Cloud security and compliance-a semantic approach in end to end security, International Journal on Smart Sensing and Intelligent Systems, V-10, I-5, PP:482-494, 2017.
2. Elankavi, R; Kalaiprasath, R; Udayakumar, R; , Wireless Zigbee Network Cluster-Capacity Calculation and Secure Data Conveyance Using Indegree, International Journal on Smart Sensing and Intelligent Systems, V-10, I-5, PP:174-185, 2017.
3. Kalaiprasath, R; Elankavi, R; Udayakumar, R; , A New Approach for Cloud Data Security: From Single to Cloud-of-Clouds, International Journal on Smart Sensing and Intelligent Systems, V-10, I-5, PP:604-613, 2017.
4. Elankavi, R; Kalaiprasath, R; Udayakumar, R; , Data Mining with Big Data Revolution Hybrid, International Journal on Smart Sensing and Intelligent Systems, V-10, I-5, PP:560-573, 2017.
5. Elankavi, R; Kalaiprasath, R; Udayakumar, Dr R; , A fast clustering algorithm for high-dimensional data, International Journal Of Civil Engineering And Technology (Ijciet), V-8, I-5, PP:1220-1227, 2017.
6. Gajmal, Yogesh M; Udayakumar, R; , Blockchain-based access control and data sharing mechanism in cloud decentralized storage system, Journal of web engineering, PP:1359–1388-1359–1388, 2021.
7. Gajmal, Yogesh M; Udayakumar, R; , A Bibliometric Analysis of Authentication based Access Control in Cloud using Blockchain, Library Philosophy and Practice, PP:0_1-16, 2021.
8. Shirke, S; Udayakumar, R; , Robust lane identification by using EW-CSA based DCNN, J. of Critical Reviews, V-6, PP:18-21, 2019.
9. Subhash, Ligade Sunil; Udayakumar, R; , A BIG SHARK ADAPTION ALGORITHM BASED RESOURCE ALLOTMENT APPROACH IN CLOUD COMPUTING ENVIRONMENT, PalArch's Journal of Archaeology of Egypt/Egyptology, V-17, I-7, PP:5374-5379, 2020.
10. Gajmal, Yogesh M; Udayakumar, R; , Privacy and utility-assisted data protection strategy for secure data sharing and retrieval in cloud system, Information Security Journal: A Global Perspective, V-31, I-4, PP:451-465, 2022.
11. Gajmal, Yogesh M; Udayakumar, R; , Analysis of Authentication based Data Access Control Systems in Cloud, PalArch's Journal of Archaeology of Egypt/Egyptology, V-17, I-7, PP:5319-5328, 2020.
12. Shirke, Suvarna; Udayakumar, R; , Evaluation of crow search algorithm (CSA) for optimization in discrete applications, 2019 3rd International Conference on Trends in Electronics and Informatics (ICOEI), PP:584-589, 2019.
13. Shirke, Suvarna; Udayakumar, Ramanathan; , A novel region-based iterative seed method for the detection of multiple lanes, International Journal of Image and Data Fusion, V-11, I-1, PP:57-76, 2020.
14. Shirke, Suvarna; Udayakumar, R; , Fusion model based on entropy by using optimized DCNN and iterative seed for multilane detection, Evolutionary Intelligence, PP:44940, 2022.
15. Shirke, Suvarna; Udayakumar, R; , Hybrid optimisation dependent deep belief network for lane detection, Journal of Experimental & Theoretical Artificial Intelligence, V-34, I-2, PP:175-187, 2022.
16. Subhash, Ligade Sunil; Udayakumar, R; , Sunflower whale optimization algorithm for resource allocation strategy in cloud computing platform, Wireless Personal Communications, V-116, PP:3061-3080, 2021.
17. Subhash, Ligade Sunil; Udayakumar, R; , A Supremacy–Responsive Resource Distribution Technique for Controlled Workflow Implementation in Cloud Surroundings, Solid State Technology, V-63, I-5, PP:7662-7669, 2020.
18. Sindhu, Velagapudi Swapna; Lakshmi, Kavuri Jaya; Tangellamudi, Ameya Sanjanita; Lakshmi, C; , A Deep Learning Approach For Detecting Type 2 Diabetes Mellitus, 2022 International Conference on Computer Communication and Informatics (ICCCI), PP:44936, 2022.
19. Priyan, Siluvayan; Udayakumar, R; Mala, Pitchaikani; Prabha, Mariappan; Ghosh, Ananya; , A sustainable dual-channel inventory model with trapezoidal fuzzy demand and energy consumption, Cleaner Engineering and Technology, V-6, PP:100400, 2022.

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20. Elankavi, R; Kalaiprasath, R; Udayakumar, R; , Potential Exploitation of Broadcasting System Using Multiple Smart Directional Antennas-Help of Sensor Network, International Journal of Mechanical Engineering and Technology (IJMET), V-8, I-6, PP:678-687, 2017.
21. Udayakumar, R; Kalam, Muhammad Abul; , Sentiment Analysis Using Machine Learning Algorithms, Mathematical Statistician and Engineering Applications, V-71, I-3s2, PP:1186–1200-1186–1200, 2022.
22. GAJMAL, YOGESH M; UDAYAKUMAR, R; , Data Access Controls in Cloud: A Survey., International Journal of Pharmaceutical Research (09752366), V-12, I-4, 2020.
23. Udayakumar, R; Khanaa, V; Kaliyamurthie, KP; , Optical ring architecture performance evaluation using ordinary receiver, Indian Journal of Science and Technology, V-6, I-6, PP:4742-4747, 2013.
24. Udayakumar, R; Khanaa, V; Kaliyamurthie, KP; , Performance analysis of resilient ftth architecture with protection mechanism, Indian Journal of Science and Technology, V-6, I-6, PP:4737-4741, 2013.
25. Udayakumar, R; Khanaa, V; Saravanan, T; , Synthesis and structural characterization of thin films of sno2 prepared by spray pyrolysis technique, Indian Journal of Science and Technology, V-6, I-S6, PP:4754-7, 2013.
26. Udayakumar, R; Khanaa, V; , Health monitoring system for induction motors, Int. J. Eng. Comput. Sci, V-2, I-4, PP:1117-1122, 2013.
27. Udayakumar, R; Khanaa, V; , Quantum Computers-A Revolution InComputing, Quantum, V-8, I-4, PP:33-36, 2013.
28. Khanaa, V; Udayakumar, R; , Protecting privacy when disclosing information: k anonymity and its enforcement through suppression, database, V-1, I-2, 2012.
29. Khanaa, V; Udayakumar, R; , Hybrid Fuzzy Approches for Networks, International Journal of Innovative Research in science, Engineering and Technology, V-12, I-3, PP:24-31, 2012.
30. Udayakumar, R; Khanaa, V; Saravanan, T; Saritha, G; , Cross layer optimization for wireless network (WIMAX), Middle-East Journal of Scientific Research, V-16, I-12, PP:2013, 2012.
31. Udayakumar, R; Thooyamani, KP; Khanaa, V; , Coarse-Grained Parallel Genetical Gorithm to Solve the Shortest Path Routing Problem Using Genetic Operators, Middle-East Journal of Scientific Research, V-15, I-12, PP:1651-1654, 2013.
32. Khanaa, V; Udayakumar, R; , Efficient Pc Controlled By Hand Movement Using Mems Sensor Mouse, Indian Journal of science and Technology, V-12, I-6, PP:1438-1442, 2012.
33. Udayakumar, R; Khanaa, V; , Sixth Sense Technology, International Journal Of Engineering And Computer Science, V-2, I-4, 2013.
34. Udayakumar, R; Thooyamani, KP; Khanaa, V; , Secure Incentive Protocol for Multi-Hop Wireless Network with Limited Use of Public Key Cryptography, Middle-East Journal of Scientific Research, V-20, I-11, PP:1651-1656, 2014.
35. Udayakumar, R; Kaliyamurthie, KP; Khanaa, TK; , Data mining a boon: Predictive system for university topper women in academia, World Applied Sciences Journal, V-29, I-14, PP:86-90, 2014.
36. Udayakumar, R; Saravanan, T; , Tailored Image District Processing Precision Andwritten Appreciation, Middle-East Journal of Scientific Research, V-20, I-11, PP:1615-1625, 2014.
37. Udayakumar, R; Thooyamani, KP; , Khanaa, Deploying site-to-site VPN connectivity: MPLS Vs IPSec, World Applied Sciences Journal, V-29, I-14, 2014.
38. Udayakumar, R; Thooyamani, KP; , Random projection based data perturbation using geometric transformation, World Applied Sciences Journal, V-29, I-1, PP:24-31, 2014.
39. Thooyamani, KP; Khanaa, V; Udayakumar, R; , Wide area wireless networks-IETF, Middle-East Journal of Scientific Research, V-20, I-12, PP:2042-2046, 2014.
40. Khanaa, V; Thooyamani, KP; Udayakumar, R; , Modelling Cloud Storage, World Applied Sciences Journal, V-29, 2014.
41. Khanaa, V; Thooyamani, KP; Udayakumar, R; , Elliptic curve cryptography using in multicast network, World Applied Sciences Journal, V-29, 2014.
42. Khanaa, V; Thooyamani, KP; Udayakumar, R; , Two factor authentication using mobile phones, World Applied Sciences Journal, V-29, I-14, PP:208-213, 2014.
43. Khanaa, V; Thooyamani, KP; Udayakumar, R; , Patient monitoring in gene ontology with words computing using SOM, World Applied Sciences Journal, V-29, 2014.
44. Kaliyamurthie, KP; Parameswari, D; Udayakumar, R; , Malicious packet loss during routing misbehavior-identification, Middle-East Journal of Scientific Research, V-20, I-11, PP:1413-1416, 2014.
45. Udayakumar, R; Saritha, G; Saravanan, T; , Modelling and Simulation of Electromechanical Systems Working with Nonlinear Frictional Loads and Controlled by Subordinated Control System of Coordinates, Middle-East Journal of Scientific Research, V-20, I-12, PP:1918-1923, 2014.

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46. Saravanan, T; Saritha, G; Udayakumar, R; , Cassette Steganography for Entrenched Metaphors in Squashed Videos, Middle-East Journal of Scientific Research, V-20, I-12, PP:2475-2478, 2014.
47. Udayakumar, R; Khanaa, V; Saravanan, T; , Energy Demand Management Motor Control Using Multilevel Inverter, Middle-East Journal of Scientific Research, V-20, I-12, PP:2613-2619, 2014.
48. Thooyamani, KP; Khanaa, V; Udayakumar, R; , Wireless cellular communication using 100 nanometers spintronics device based VLSI, Middle-East Journal of Scientific Research, V-20, I-12, PP:2037-2041, 2014.

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