IRIS Recognition using Conventional Approach

Essam-Eldean F. Elfakhrany[1], *Ben Bella S. Tawfik*[2]

[1]Business Information Systems department
Arab Academy for Since & Technology
Cairo, Egypt
essam.elfakharany@aast.edu
[2]College of Computers & Informatics
Suez Canal University
Ismailia, Egypt
benbellat@gmail.com

Abstract

The proper functioning of many of our social, financial, and political structures nowadays relies on the correct identification of people. Reliable and unique identification of people is a difficult problem; people typically use identification cards, usernames, or passwords to prove their identities, however passwords can be forgotten, and identification cards can be lost or stolen. Biometric methods, which identify people based on physical or behavioural characteristics, are of interest because people cannot forget or lose their physical characteristics in the way that they can lose passwords or identity cards. Biometric systems have been developed based on fingerprints, facial features, voice, hand geometry, handwriting, the retina, and the one presented in this work, the iris. Iris is difficult issue because of pre-processing and segmentation phases. In other word, preparing the iris in a rectangular image format is a complicated issue. This work concentrates on segmentation issue. A good segmentation reflects on perfect recognition with minimum number of features. With only three features, 100% recognition can be achieved. A comparative study between different methodologies is introduced. This study shows the efficiency of the proposed model.

***Keywords*— Wavelet transform, IRIS, Segmentation, Biometric systems, moments**

Published In:
2013 IEEE 9th International Colloquium on Signal Processing and its Applications, 8 - 10 Mac. 2013, Kuala Lumpur, Malaysia

REFERENCES

1. S. M. Metev and V. P. Veiko, *Laser Assisted Microtechnology*, 2nd ed., R. M. Osgood, Jr., Ed. Berlin, Germany: Springer-Verlag, 1998.
2. J. Breckling, Ed., *The Analysis of Directional Time Series: Applications to Wind Speed and Direction*, ser. Lecture Notes in Statistics. Berlin, Germany: Springer, 1989, vol. 61.
3. S. Zhang, C. Zhu, J. K. O. Sin, and P. K. T. Mok, "A novel ultrathin elevated channel low-temperature poly-Si TFT," *IEEE Electron Device Lett.*, vol. 20, pp. 569–571, Nov. 1999.

4. M. Wegmuller, J. P. von der Weid, P. Oberson, and N. Gisin, “High resolution fiber distributed measurements with coherent OFDR,” in *Proc. ECOC’00*, 2000, paper 11.3.4, p. 109.
5. R. E. Sorace, V. S. Reinhardt, and S. A. Vaughn, “High-speed digital to- RF converter,” U.S. Patent 5 668 842, Sept. 16, 1997.
6. M. Shell. (2002) IEEEtran homepage on CTAN. [Online]. Available: http://www.ctan.org/texarchive/macros/latex/contrib/supported/IEEEtran/
7. J. Padhye, V. Firoiu, and D. Towsley, “A stochastic model of TCP Reno congestion avoidance and control,” Univ. of Massachusetts, Amherst, MA, CMPSCI Tech. Rep. 99-02, 1999.

BUSINESS INTELLIGENT MODEL FOR MANAGING AND CONTROLLING POLICE PATROLS ENERGY

BEN BELLA S. TAWFIK1, ABDEL-FATAH A. HEGAZY2 & HANY M. FAWZY IBRAHIM3

1Doctor of Engineering, Faculty of Computers & Informatics, Suez Canal University, Egypt
2 Prof. Doctor, Arab Academy for Science and Technology & Maritime Transport, Egypt
3Police Lt. Colonel, Ministry of Interior, Egypt

ABSTRACT

The task of planning patrol routes for crime prevention is an important challenge. This work concentrates on the context of routes for police patrols on a road network; the presented methods are applicable to many other environments that call for the selection of surveillance and situation response routes to maximize the profit. In other words, planning patrol routes to maximize coverage of important locations (hot spots) at minimum cost (length of patrol route) subject to some constraints. We model a road network using an edge-weighted graph in which edges represent streets, vertices represent intersections, and weights represent importance of the corresponding streets. In addition to the importance of streets (edge weights), important routes are affected by the topology of the road network. This paper is considered the integrated optimization of strategic patrol routing problems while designing an efficient operating plan for the police troopers. Its formulation is a methodological contribution to the current literature. In this work, a new methodology is introduced for energy saving control problem in police patrols networks. The objective function is minimizing the variance of the power vector for the topology troopers, this means that distributing the power of the police patrols and maintaining the crime prevention with minimum effort. Inputs are given as a set of nodes in a plane, end-to-end traffic demands and delay bounds between hot spot pairs, the problem is to find an optimized routing that can meet the requirements and the variance of the power vector for the nodes is minimized. The problem is formulated as an Integer Linear Programming problem. An optimal algorithm has been proposed to solve the problem. The proposed model can be adopted for different topology with different emergency request demands.

KEYWORDS: Integer Linear Programming, Energy Saving, Police Patrols Network, Geographical Information System (GIS)

Published In:

International Journal of Computer Science Engineering and Information Technology Research (IJCSEITR), ISSN 2249-6831Vol. 3, Issue 1, Mar 2013, 285-292 © TJPRC Pvt. Lt

REFERENCES

1. A. John Rajan, K. Ganesh, and K.V. Narayanan, Application of Integer Linear Programming Model for Vendor Selection in a Two Stage Supply Chain, Proceedings of the 2010 International Conference on Industrial Engineering and Operations Management Dhaka, Bangladesh, January 9 – 10, 2010.
2. Burcu Keskin, Optimal Traffic Resource Allocation and Management, Department of Information Systems, Statistics, and Management Science, University of Alabama, May 2010.
3. Dana Andrew Steil, Creation of Crash-Counter Measure Police Patrol Routes Targeting Hotspot Road Segments, dissertation, Department of Computer Science in the Graduate School of The University of Alabama, 2010.
4. E. L. Lloyd, R. Liu, M. V. Marathe, R. Ramanathan and S. S. Ravi, "Algorithmic aspects of topology control problems for ad hoc networks", *ACM MobiHoc'02*.

5. Kevin M. Curti, Karen Hayslett-McCall, and Fang Qiu, Determining Optimal Police Patrol Areas with Maximal Covering and Backup Covering Location Models, October 2007.
6. Pei-Fen Kuo, Using geographical information systems to effectively organize police patrol routes by grouping hot spots of crash and crime data, Zachry Department of Civil Engineering, Texas A&M University, October, 2012.
7. L. Hu, "Topology control for multihop packet radio networks", *IEEE Trans. On Communications*, vol. 41, no. 10, 1993, pp. 1474-1481.
8. N. Li, J. Hou and Lui Sha, "Design and analysis of an MST-based topology control algorithm", *IEEE INFOCOM'03*.
9. Shuchita Upadhayaya, and Charu Gandhi Networks (IJWMN), Quality of Service routing in mobile ad hoc Network using location and energy parameters, Vol 1, No 2, November 2009
10. T. Hou and Victor O.K. Li, "Transmission range control in multihop packet radio networks", *IEEE Trans on Communications*, vol. 34, no. 1, Jan 1986, pp.38-44.

Applying Data Mining Techniques To Forecast The Natural Gas Consumption Using An Effective Business Intelligence Model.

Ben Bella S. Tawfik, Abdel-Fatah A. Hegazy, and Amro A. Shoeib

Arab Academy for Science and Technology and Maritime Transportation
Misr El-Gadida, Cairo, Egypt
Benbellat@gmail.com, Hegazy@aast.edu, Amro4cs@hotmail.com

Abstract

The key issue for decision making in public utility- Enterprises is obtaining the right information at the right time to the right decision makers. Here we present a model intended to predict mainly the residential, commercial and industrial natural gas consumption by applying BI/DM – a predictive analytics method on a certain predefined attributes using regression algorithm and a multiple nonlinear regression model which mathematically represents the relationship between natural gas consumption and influential variables. Mining the natural gas public utility Enterprise Data Warehouse of an administrative district to assist in management planning for effective decision making. Data Preprocessing includes cluster analysis. Wavelet transform is used to analyze the data with different scale (multi-resolution analysis). In this phase, the selection of the best scale which describe the actual data and ignore the details (or noise). In this work different fitting models are introduced. The first model was polynomial fitting with single independent variable. Then multiple linear regression models are introduced. Finally, non linear regression models are discussed. To measure the goodness of fit, R2 value is calculated. The challenge was to select the best fitting model. The best model is reached with 4th order non-linear regression model with 0.97 R2 value.

Keywords: *BI, DSS, DM, Cluster Analysis, Wavelet Transform, Polynomial fitting, Multiple Regressions, Predictive Analytics.*

Published In: Egyptian Computer Science Journal Vol. 36 No.2 May 2012

References

1. Fayyad, Usama; Gregory Piatetsky-Shapiro, and Padhraic Smyth (1996). "From Data Mining to Knowledge Discovery in Databases". Retrieved 2008-12-17.
2. Spiegel, M. R., 1958 Applied Mathematics for Engineers and Scientists, McGraw Hill, NY
3. Yalcinoz, T. and Eminoglu, U.: Short term and medium term power distribution load forecasting by neural networks, Energy Conversion and Management, Vol. 46, No. 9-10, pp. 1393-1405, 2005.
4. S. Kotsiantis, D. Kanellopoulos, P. Pintelas, "Data Preprocessing for Supervised Leaning", International Journal of Computer Science, 2006, Vol 1 N. 2, pp 111–117.

5. Donald Farmer, *Principal Program Manager, US-SQL Analysis Services, Microsoft Corporation,* Smart Business Intelligence Solutions with Microsoft® SQL Server® 2008
6. Beccali, M., Cellura, M., Lo Brano, V., Marvuglia, A.: Forecasting daily urban electric load profiles using artificial neural networks, Energy Conversion and Management, Vol. 45, No. 18-19, pp. 2879–2900, 2004.
7. J. C. Goswami, A. K. Chan, 1999, "Fundamentals of wavelets: theory, algorithms, and applications," John Wiley & Sons, Inc.
8. I. Daubechies, 1992, "Ten lectures on Wavelets," CBMS-NSF Series in Appl. Math., #61, SIAM, Philadelphia.
9. C.K. Chui, 1992, "An Introduction to Wavelets," Academic Press, Boston.
10. A. Cohen, R. D. Ryan, 1995, " Wavelets and Multiscale Signal Processing," Chapman & Hall.
11. J. J. Benedetto, M.W. Frazier, 1994, "Wavelets-Mathematics and Applications," CRC Press, Inc.
12. Chatterjee, S., and A. S. Hadi. "Influential Observations, High Leverage Points, and Outliers in Linear Regression." *Statistical Science*. Vol. 1, 1986, pp. 379–416.
13. Seber, G. A. F., and C. J. Wild. *Nonlinear Regression*. Hoboken, NJ: Wiley-Interscience, 2003.
14. DuMouchel, W. H., and F. L. O'Brien. "Integrating a Robust Option into a Multiple Regression Computing Environment." *Computer Science and Statistics: Proceedings of the 21st Symposium on the Interface*. Alexandria, VA: American Statistical Association, 1989.
15. Holland, P. W., and R. E. Welsch. "Robust Regression Using Iteratively Reweighted Least-Squares." *Communications in Statistics: Theory and Methods*, *A6*, 1977, pp. 813–827.