

{tag}

{/tag}

International Journal of Computer Applications  
© 2014 by IJCA Journal

Volume 96 - Number 25

Year of Publication: 2014

Authors:

Morteza Kolali Khormuji

Mehrnoosh Bazrafkan

Maryam Sharifian

Seyed Javad Mirabedini

Ali Harounabadi

10.5120/16947-6736

{bibtex}pxc3896736.bib{/bibtex}

## Abstract

Credit Card Fraud is one of the biggest threats to business establishments today. This paper presents a cascade artificial neural network for the recognition of credit card fraud detection. This system aims at attaining a very high recognition rate and a very high reliability. In other words, excellent recognition performance of credit card fraud detection was obtained. Then, One solution was proposed: utilizing a cascade artificial neural networks for enhancing recognition rate and reducing rejection rate. The gating networks (GNs) are used to congregate the confidence values of three parallel artificial neural networks (ANNs) classifiers. The Imperialist Competitive Algorithm (ICA) is a new evolutionary algorithm which was recently

introduced and has a good performance in some optimization problems. The weights of the GNs are trained by the Imperialist Competitive Algorithm (ICA) to achieve the overall optimal performance. The experiments conducted on the database from a large Brazilian bank produced encouraging results: high accuracy of 98.56% with minimal rejection in the last cascade layer.

## References

### ences

- Venkata Ganji, Siva Naga Prasad Mannem, Vol. 4 No. 06 June (2012), Credit card fraud detection using anti-k nearest neighbor algorithm, International Journal on Computer Science and Engineering (IJCSE).
- Raghavendra Patidar, Lokesh Sharma, Volume-1 Issue- NCAI2011, June (2011), Credit Card Fraud Detection Using Neural Network, International Journal of Soft Computing and Engineering (IJSCE).
- Manoel Fernando Alonso Gadi, Xidi Wang and Alair Pereira do Lago, (2008), Credit Card Fraud Detection with Artificial Immune System, Springer-Verlag Berlin Heidelberg.
- Kundu, A. ; Sch. of Inf. Technol. , Indian Inst. of Technol. , Kharagpur, India ; Panigrahi, S. ; Sural, S. ; Majumdar, A. K. , (27 February 2009), BLAST-SSAHA Hybridization for Credit Card Fraud Detection Dependable and Secure Computing, IEEE Transactions on (Volume:6 , Issue: 4 )
- Bhattacharyya, S, S Jha, K Tharakunnel, and Westland J. C. , (2011), Data mining for credit card fraud: A comparative study. , Decision Support Systems pp. 602-613.
- C. Y. Suen, J. Tan, (2005), Analysis of errors of handwritten digits made by a multitude of classifiers, Pattern Recognition Lett. 26 (1) pp. 369-379.
- Alahakoon, L. D. and Halgamuge, S. K. , (1998), Knowledge Discovery with Supervised and Unsupervised Self Evolving Neural Networks, Proc. Inter. Conf. Information-Intelligent Systems, pp. 907-910.
- C. Frelicot, L. Mascarilla, (2002), Reject strategies driven combination of pattern classifiers, Pattern Anal. Appl. 5 (2) pp 234- 243.
- C. K. Chow, (1970), On optimum recognition error and reject tradeoff, IEEE Trans. Inf. Theory 16 (1) pp 40-46.
- Robert N. Ascher, George M. Koppelman, Martha J. Miller, G. Nagy, Glenmore L. Shelton Jr. , (1971), An interactive system for reading unformatted printed text, IEEE Trans. Computer. C- 20 (12) pp 1527-1543.
- Suvasini Panigrahi, Amlan Kundu, Shamik Sural, A. K. Majumdar, October (2009) Credit card fraud detection: A fusion approach using Dempster-Shafer theory and Bayesian learning Special Issue on Information Fusion in Computer Security science direct Pages 354-363.
- O. D. Trier, A. K. Jain, T. Taxt, (1996), Feature extraction methods for character recognition a survey, Pattern Recognition 29 (4) pp 641-662.
- White H. (1989), Learning in Artificial Neural Networks: A Statistical Perspective, Neural Computat. , Vol. 1, No. 4, pp. 425- 469.
- Asari, V. K. , (2001), Training of a Feedforward Multiple- Valued Neural Network by Error Backpropagation with a Multilevel Threshold Function, IEEE Trans. on Neural Networks,

Vol. 12, No. 6, pp. 1519-1520, Nov.

- R. O. Duda, P. E. Hart, and D. G. Stork, (2000), Pattern Classification, John Wiley and Sons, Inc. , Wiley-Interscience, Second Edition.
- Il-Seok Oh, J. S. Lee, and C. Y. Suen, (1999), Analysis of Class Separation and Combination of Class-Dependent Features for Handwriting Recognition, IEEE Transaction on PAMI, Vol. 21, No. 10, Oct. , pp. 1089-1094.
- M. Bressan and J. Vitria, October (2003), On the Selection and Classification of Independent Features, IEEE Transactions on PAMI, Vol. 25, No. 10, pp. 1312-1317.
- Peter J. Bentley, Jungwon Kim, Gil-Ho Jung and Jong-Uk Choi (2000). Fuzzy Darwinian Detection of Credit Card Fraud. In the 14th Annual Fall Symposium of the Korean Information Processing Society. 13th-14th October.
- E. Atashpaz Gargari, C. Lucas, (2007), Imperialist competitive algorithm: An algorithm for optimization inspired by imperialistic competition , in: IEEE Congress on Evolutionary Computation, Singapore, pp 4661 - 4667.
- A. M. Jasour, E. Atashpaz, C. Lucas, (2008), Vehicle fuzzy controller design using imperialist competitive algorithm, in: Second First Iranian Joint Congress on Fuzzy and Intelligent Systems, Tehran, Iran.

Computer Science

### Index Terms

Security

### Keywords

Credit Card Fraud Detection Cascade Neural Networks Imperialist Competitive Algorithm