Abstract

Artificial Neural Network is a branch of Artificial intelligence, has been accepted as a new technology in computer science. Neural Networks are currently a 'hot' research area in medicine, particularly in the fields of radiology, urology, cardiology, oncology and etc. It has a huge application in many areas such as education, business; medical, engineering and manufacturing. Neural Network plays an important role in a decision support system. In this paper, an attempt has been made to make use of neural networks in the medical field (carcinogenesis (pre-clinical study)). In carcinogenesis, artificial neural networks have been successfully applied to the problems in both pre-clinical and post-clinical diagnosis. The main aim of research in medical diagnostics is to develop more cost-effective and easy-to-use systems, procedures and methods for supporting clinicians. It has been used to analyze demographic data from lung cancer patients with a view to developing diagnostic algorithms
that might improve triage practices in the emergency department. For the lung cancer diagnosis problem, the concise rules extracted from the network achieve an high accuracy rate of on the training data set and on the test data set.

Reference

5. Bartfay, E. Ph.D; Mackillop, W. J. MBCHB; Pater, J. L(2006). MDMSC- “Comparing the predictive value of neural network models to logistic regression models on the risk of death for small-cell lung cancer patients”, ASSOCIATE PROFESSOR, University of Ontario Institute of Technology, Oshawa, Ontario, Canada (BARTFAY),DIVISION DIRECTOR, Queen's Cancer Research Institute, and professor and head, Department of Community Health & Epidemiology, Queen's University, Kingston, Ontario, Canada (MACKILLOP) (PATER):- Emma Bartfay, Faculty of Health Sciences, University of Ontario Institute of Technology, Oshawa, ON L1H 7K4, Canada (e-mail: emma.bartfay@uoit.ca), European Journal of Cancer Care:Volume 15(2)May 2006p
22. E. BARTFAY, PHD , ASSOCIATE PROFESSOR 1 , W.J. MACKILLOP, MB , CHB , DIVISION DIRECTOR 2 & J.L. PATER, MD , MSC , DIVISION DIRECTOR 3(2006) – ”Comparing the predictive value of neural network models to logistic regression models on the risk of death for small-cell lung cancer patients”, 1 University of Ontario Institute of Technology, Oshawa, Ontario, 2 Queen’s Cancer Research Institute, and professor and head, Department of Community Health & Epidemiology, Queen's University, Kingston, Ontario, 3 Queen’s Cancer Research Institute, Department of Oncology, Queen’s University, Kingston, Ontario, Canada.
30. Gutte, Henrika; Jakobsson, Davidb; Olofsson, Fredrikb; Ohlsson, Mattiasb c; Valind, Svenb; Loft, Annikaa; Edenbrandt, Larsb d; Kjær, Andreasa e(2007) – “Automated interpretation of PET/CT images in patients with lung cancer”- Departments of aClinical Physiology, Nuclear Medicine and PET, Rigshospitalet, Copenhagen University Hospital,
Denmark bClinical Physiology, Malmö University Hospital, Sweden cTheoretical Physics, Lund University, Sweden dClinical Physiology, Sahlgrenska University Hospital, Göteborg, Sweden eCluster for Molecular Imaging, University of Copenhagen, Denmark ,Correspondence to Dr Henrik Gutte, Department of Clinical Physiology, Nuclear Medicine and PET, Rigshospitalet, Copenhagen University Hospital, Denmark-Nuclear Medicine Communications:Volume 28(2)February 2007.


32. Hatzilygerodudis , P.J.Vassilakos, A.tsakalidis (1997)-XBONE: “A Hybrid Expert System Supporting Diagnosis of Bone Diseases"- University of patras, school of engineering, dept of computer engine.& informatics, Greece and computer technology institute, Greece. Regional university hospital of patras, dept of nuclear medicine patras Greece.Published in the proceedings of the medical informatics europe'97

33. Heine H. Hansen, MD(1990)- Lung Cancer—“A Changing Picture",National University Hospital, The Finsen Center 5072,9 Blegdamsvej, Copenhagen DK-2100, 1990


37. Jan Baumbach1,2, Alexander Bunkowski1, Sita Lange1,3, Timm Oberwahrenbrock1, Nils Kleinv ” olting1,3, Sven Rahmann1, J org Ingo Baumbach4 IMS2 (2007)— “An integrated medical software system for early lung cancer detection using ion mobility spectrometry data of human breath “1 Computational Methods for Emerging Technologies, Genome Informatics, Technische Fakult ” at, Bielefeld University, 33594 Bielefeld, Germany 2 International NRW Graduate School in Bioinformatics and Genome Research, Bielefeld University 3 Bioinformatics Resource Facility, Bielefeld University 4 Department of Metabolomics, ISAS - Institute for Analytical Sciences, Bunsen-Kirchhoff-Str. 11, 44139 Dortmund, Germany - Journal of Integrative Bioinformatics 2007

38. Jari J. Forssstrm a; Kevin J. Dalton b (1995) –“Artificial Neural Networks for Decision Support in Clinical Medicine” - Department of Medicine, University of Turku, Finland-(a)Obstetrics and Gynaecology, Division of Materno-Fetal Medicine, (b)University of Cambridge, Rosie Maternity Hospital, Cambridge, UK,Annals of Medicine Vol 27,I 5,1995.

39. Javed Khan1,2, Jun S. Wei1, Markus Ringner1,3, Lao H. Saal1, Marc Ladani4, Frankwestermann 5, Frank Berthold 6, Manfred Schwab 5, Cristina R. Antoescu 4, Carsten Peterson 3 & Paul S. Meltzer 1 (2001)-Classification and diagnostic prediction of cancers using gene expression profiling and artificial neural networks ,1Cancer Genetics Branch, National Human Genome Research Institute,National Institutes of Health, Bethesda, Maryland, USA 2Pediatric Oncology Branch, Advanced Technology Center, National Cancer Institute, Gaithersburg, Maryland, USA-2001 ,3Complex Systems Division, Department of Theoretical Physics, Lund University, Lund, Sweden 4Department of Pathology, Memorial Sloan-Kettering Cancer Center, New York, New York, USA 5Department of Cytogenetics, German Cancer
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54. MF Wu, JJ Chiang1,2, YC Yang, IH Chao, SM Shieh2, WC Tzeng, Hsieh(2001)-“Predicting Hyperkalemia by a Two-Staged Artificial Neural Network”. 1Department of Bioinformatics, Chung Hua University, Hsin-Chu, Taiwan,2Wei Gong Memorial Hospital, Miao-Li, Taiwan 45. Poters RS etc. Prediction of hyperkalemia in dogs from electrocardiographic parameters using an artificial neural network. Academic Emergency Medicine. 2001; 8(6):599-603.


58. N.A. Khan, F. Afroz, M.M. Lone, M.A. Teli, M. Muzaffar and N. Jan(2006) –“study by Department of Radiation Oncology”, Sher-i-Kashmir Institute of Medical Sciences, Srinagar, India-2006


recurrence can be predicted by neural network analysis”. Breast Cancer Res Treat, 1992; 21(1): 47-53


76. Wan Hussain , Wan Ishak(2002)-“The Potential of Neural Networks in Medical Applications” - Faculty of Information Technology, Universiti Utara Malaysia, 06010 Sintok, Kedah, MALAYSIA(2002).


82. Xin Yao (1999)–“Evolving Artificial Neural Networks”- Senior member Proceedings of the IEEE, Sep 1999, Vol-87, IEEE

83. Yang TF etc(1994). “Use of artificial neural networks within deterministic logic for the
Application of Neural Networks in Diagnosing Cancer Disease using Demographic Data


Index Terms

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Neural networks  fuzzy logic
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