Neural Networks for Chemists: An Introduction

Quick and reliable diagnosis of stomach cancer by artificial neural network

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Abstract: - Approximately 90% of stomach cancers are adenocarcinoma that directly distribute from stomach wall to the neighbor tissue of stomach .this kind of cancer is more common in persons who are more than 40 and its spread in men is twice as much as women. Unfortunately, this cancer doesn't have any sign until it develops to its advanced level.
Generally biopsy, endoscopy, laparoscopy, ultra sonography, CT scan, x-ray radiography and proper clinical test are applied for cancer detection.

By advancing artificial neural network technique and due to the difficulty in detection of stomach cancer with clinical and medicinal parameters, we decided to apply ANN for quick detection of stomach cancer. To do so, we use 50 clinical and medicinal parameters taken from 126 person (90 had cancer and 36 was normal as a testifier).

We carried out independent sample T-Test with SPSS software for 50 parameters. Regard to the results of this analysis we selected 8 parameters that had lowest sig for ANN analysis (among parameters whose sig was less than 0.05).These parameters are age, anorexia, weight reduction, MCH ,MCHC, Na^+ reduction, Ca^{2+} reduction and X-ray radiography.

Selected parameters of 126 persons split to three groups with Matlab software: training group (80%), validation group (10%), and test group (10%).

Artificial neural network that we designed has three layers, 8 neurons as input, 8 neurons as hidden and 1 neuron as output. Split data are applied for training network with Levenberg-Marquardt learning algorithm. Finally, Performance of learning was 0.056, Regression coefficient between the output of trained network for test data and real results of test data was 0.927 and the area under ROC curve was 0.883. With these results we can conclude that training process was done successfully and accurately.

Key words: Cancer, stomach, ANN, Artificial Neural Network, Training, SPSS, Matlab

1 Introduction

Although the gastric cancer incidence rates have been declining in many countries, the most recent estimates show that it is the fourth most common cancer; Gastric cancer is the second commonest malignancy in the world and after lung cancer kills more people than any other malignant tumors. [1, 2, 3]

The prognosis for gastric cancer once a diagnosis has been made is poor. [2]
Physicians usually diagnose gastric cancer with clinical symptoms and laboratory technique as follow:
Gastric cancer when superficial and surgically curable, usually produce no symptoms. As the tumor

Neural Networks for Chemists; An Introduction. Authors: Jure Zupan J. Gasteiger . Publication: Book. Neural Networks for Chemists; An Introduction.Neural Networks for Chemists: An Introduction The authors pinpoint the five most widely used neural networks and learning strategies, illustrating them with.Title, Neural networks for chemists: an introduction. Authors, Jure Zupan, Johann Gasteiger. Edition, illustrated. Publisher, VCH, ISBN, From reviews of the first edition: i?1?2This book offers a sound introduction to artificial neuronal networks, with insights into their architecture, functioning, and.International journal of research in physical chemistry and chemical physics Neural Networks for Chemists (An Introduction). K. Fiedler.tions on the use of neural networks in chemistry. What In this introductory article we shall first introduce the of neural nets in the field of chemistry., 2]. 2.Because. Selling in the social media marketplace Conventional thinking several years ago suggested that social Neural Networks for Chemists An Introduction.Book Review: Neural Networks for Chemists: An Introduction. Show all authors. Tony Davies Tony Davies See all articles by this author. Search Google.Neural networks for chemists: an introduction. J Zupan, J Neural networks: A new method for solving chemical problems or just a passing phase? J Zupan, J.I. Introduction. Neural networks [13] are computer or algorithmic systems derived from a simplified concept of brain in which a number of nodes, called the .Introduction to Artificial Neural Network (ANN) Methods: What They Are intensive use among chemists are the artificial neural networks (or.Applications of Neural Computing for Process Chemists: I. Introduction to Neural Network. D. Mukesh. Alchemie Research Center, Thane Belapur Rd.function approximation tasks in physics, chemistry or other fields. INTRODUCTION. Neural networks are powerful function approximators that hold great promise.discovery second edition in medicinal chemistry neural networks a tool for drug based drug design introduction to computational chemistry 2nd edition by f.Artificial neural network implementation of chemistry with pdf simulation of H2/CO 2 flames? A novel approach using artificial neural networks for representing chemical reactions . Neural Computing: An Introduction, IOP Publishing ().Chemistry permeates all aspects of our life, from the development of new drugs to the In contrast, deep neural networks are able to infer the underlying .. For large molecules it is reasonable to introduce a distance cutoff.Kop Neural Networks in Chemistry and Drug Design av Jure Zupan, Johann first edition: 'This book offers a sound introduction to artificial neuronal networks, .FP4,An innovative method could be developed to model technical combustion processes and to design combustion chambers. The method should be based on .Buy Neural Networks for Chemists: An Introduction by Jure Zupan, Johann Gasteiger (ISBN:) from Amazon's Book Store. Everyday low prices.

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