Accepted Manuscript

Title: Evolutionary radial basis function network for gestational diabetes data analytics

Author: Mário W.L. Moreira Joel J.P.C. Rodrigues Neeraj Kumar Jalal Al-Muhtadi Valeriy Korotaev

PII: S1877-7503(17)30472-6
DOI: http://dx.doi.org/doi:10.1016/j.jocs.2017.07.015
Reference: JOCS 730

To appear in:

Received date: 1-5-2017
Revised date: 23-6-2017
Accepted date: 21-7-2017

Please cite this article as: Mário W.L. Moreira, Joel J.P.C. Rodrigues, Neeraj Kumar, Jalal Al-Muhtadi, Valeriy Korotaev, Evolutionary radial basis function network for gestational diabetes data analytics, *<![CDATA[Journal of Computational Science]]>* (2017), http://dx.doi.org/10.1016/j.jocs.2017.07.015

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Evolutionary Radial Basis Function Network for Gestational Diabetes Data Analytics

Mário W. L. Moreira[a,b], Joel J. P. C. Rodrigues[a,c,d,e,*], Neeraj Kumar[f], Jalal Al-Muhtadi[g], Valeriy Korotaev[d]

[a] *Instituto de Telecomunicações, Universidade da Beira Interior, Covilhã, Portugal*
[b] *Instituto Federal de Educação, Ciência e Tecnologia do Ceará (IFCE), Aracati, Brazil*
[c] *National Institute of Telecommunications (Inatel), Santa Rita do Sapucaí, MG, Brazil*
[d] *ITMO University, Saint Petersburg, Russia*
[e] *University of Fortaleza (UNIFOR), Fortaleza, CE, Brazil*
[f] *Thapar University, Patiala (Punjab), India*
[g] *King Saud University, Riyadh 12372, Saudi Arabia*

Abstract

The development of smart decision support systems (DSSs) that seek to simulate human behavioral aspects is a major challenge for computational intelligence (CI). Artificial neural network (ANN) approaches have the ability to solve complex decision-making problems that involve uncertainty and a large amount of information in a fast and reliable way. The application of this evolutionary CI technique to analyze a large amount of data is an important strategy to solve several problems in healthcare management. This paper proposes the modeling, performance evaluation, and comparison analysis of an ANN technique known as the radial basis function network (RBFNetwork) to identify possible cases of gestational diabetes that can lead to multiple risks for both the pregnant women and the fetus. This method achieved promising results with a precision of 0.785, F-Measure of 0.786, ROC area of 0.839, and Kappa statistic of 0.5092. These indicators show that this ANN-based approach is an excellent predictor for gestational diabetes mellitus. This research provides a comprehensive decision-making model capable of improving the care provided to women who are at a risk of developing gestational diabetes, which is the most

*National Institute of Telecommunications (Inatel), Av. Joo de Camargo, 510 - Centro, 37540-000 Santa Rita do Sapucaí, MG, Brazil. Tel. +55 35 3471-9281
Email address: joeljr@ieee.org (Joel J. P. C. Rodrigues)

Accepted Manuscript

Download English Version:

https://daneshyari.com/en/article/6874311

Download Persian Version:

https://daneshyari.com/article/6874311

Daneshyari.com