Abstract

Intelligent computing methods and knowledge based systems are well known techniques used for the detection of various medical disorders. This paper is based on the review of various intelligent computing methods that are used to detect sleep disorders. The main concern is based on the detection of sleep disorders such as sleep apnea, insomnia, parasomnia and snoring. The most common diagnostic methods used by many researchers are based on knowledge-based system (KBS), rule based reasoning (RBR), case based reasoning (CBR), fuzzy logic (FL), artificial neural network (ANN), support vector machine (SVM), multi-layer perceptron (MLP) neural network, genetic algorithm (GA), k-nearest neighbor (k-NN), hybrid neural network, bayesian network (BN), data mining (DM) and many other integrated approaches. In traditional approach questionnaire was used for the detection of various disorders that is now overcome with all above mentioned techniques to enhance the accuracy, sensitivity and specificity.


- Becq G. et al. (2005) Comparison Between Five Classifiers for Automatic Scoring of Human Sleep Recording; Studies in Computational Intelligence (SCI), vol. 4, pp. 113-127.
- Bellos Christos et al. (August 30 - September 3, 2011) Heterogeneous Data Fusion and Intelligent Techniques Embedded in a Mobile Application for Real-Time Chronic Disease Management; in: Proceedings of 33rd Annual International Conference of the IEEE, EMBS.
Intelligent Computing Techniques for the Detection of Sleep Disorders: A Review


- Donald L. Bliwise et al. (1999) &apos;Correlates of the &quot;don&apos;t know&quot; response to questions about snoring&apos; am j respir crit care med., vol. 160, pp. 1812–1815.


- Emoto T. et al. (August 23-26,2007) &apos;Feature Extraction for Snore Sound via Neural Network Processing&apos; in: Proceedings of the 29th Annual International Conference of the IEEE EMBS.


- Gabran S. R. I. et al. (September 2-6,2009) &apos;Portable Real-time Support-Vector-Machine-Based Automated Diagnosis and Detection Device of Narcolepsy Episodes&apos; in: Proceedings of 31st Annual International Conference of the IEEE EMBS.

- Golz et al. (2001) &apos;Application of Vector-Based Neural Networks for the Recognition of Beginning Microsleep Episodes with an Eyetracking System&apos; in: Proceedings on the Computational Intelligence: Methods and Applications (CIMA), pp. 130-134.

- Gorur Dilan et al. (2002) &apos;Sleep Spindles Detecton using Short Time Fourier
- Han G. Jo et al. (July 2010) Genetic fuzzy classifier for sleep stage identification; Computers in Biology and Medicine, vol. 40, Issue 7, pp. 629-634.
- Herscovici Sarah et al. (2007) Detecting REM sleep from the finger: an automatic REM sleep algorithm based on peripheral arterial tone (PAT) and actigraphy; Physiological Measurement., vol. 28, Issue 2.
- Ho Viet Lam and Nguyen Thi My Ding; data mining; available at http://www.ustudy.in/node/6653 (accessed on 7 March 2013).


- Maali Yashar et al. (Dec 4, 2012) Self-Advising SVM for Sleep Apnea Classification in: Proceedings of the Workshop on New Trends of Computational Intelligence in
Health Applications; In conjunction with the 25th Australasian Joint Conference on Artificial Intelligence, Sydney, Australia, , pp. 24-33.
- Montani S. et al. (2003) Integrating model-based decision support in a multi-modal reasoning system for managing type 1 diabetic patients; Artificial Intelligence in Medicine, Vol. 29, pp. 131-151.
- Park Hae Jeong et al. (July 23-28,2000) Hybrid Neural-network and Rule-based Expert System for Automatic Sleep Stage Scoring; in: Proceedings of the 22nd Annual EMBS international Conference, Chicago IL.
- Romero Oscar Fontenla et al. (2005) &apos;A new method for sleep apnea classification using wavelets and feedforward neural networks&apos; Elsevier: Artificial Intelligence in Medicine, vol. 34, pp. 65-76.
- Roth Thomas et al. (March 2002) &apos;A new questionnaire to detect sleep disorders&apos; Elsevier: Sleep Medicine, vol. 3, Issue 2, pp. 99–108.
- Shmie Oren et al. (15 May 2009) &apos;Data mining techniques for detection of sleep arousals&apos; Journal of Neuroscience Methods, vol. 179, Issue 2, pp. 331-337.
- Sorensena Gertrud Laura et al. (August 30 - September 3, 2011), &apos;Detection of arousals in Parkinson&apos;s disease patients&apos; in: Proceedings of 33rd Annual International Conference of the IEEE, EMBS Boston, USA.
- Souza José Carlos et al. (Sept. 2002 &apos;Insomnia And Hypnotic Use In Campo Grande General Population&apos; Arq. Neuro-Psiquiatr, Brazil, vol. 60, Issue. 3-B, 702-707.
Intelligent Computing Techniques for the Detection of Sleep Disorders: A Review

- Srinivasa Gopal &apos;Case Based reasoning&apos; available at http://ezinearticles.com/?Case-Based-Reasoning&amp;id= 3405015 (accessed on 7 March 2013).
- Sun Lei Ming et al. (September 2011), &apos;A prediction model based on an artificial intelligence system for moderate to severe obstructive sleep apnea&apos; Sleep and Breathing, vol. 15, Issue 3, pp. 317-323.
- Vijaylaxmi et al. (2-7 Jan,2012) &apos;Sleep Stages Classification Using WaveletTransform & Neural Network&apos; in: Proceedings of the IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI 2012) Hong Kong and Shenzhen, China.
- Wikipedia &apos;Fuzzy Logic&apos; available at http://wiki.answers.com/Q/What__are__the__advantages__and__disadvantages__of__fuzzy_logic (accessed on 7 March 2013).
- Yadollahi Azadeh, Moussavi Zahra (September 2-6,2009) &apos;Acoustic Obstructive sleep apnea detection&apos; in: Proceedings of 31st Annual International Conference of the IEEE EMBS, Minneapolis, Minnesota, USA.
- Yldiz Abdulsasir et al. (2011) &apos;An expert system for automated recognition of patients with obstructive sleep apnea using electrocardiogram recordings&apos; Elsevier:

Index Terms

Computer Science
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Keywords
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