# Chapter 1
# Medical Diagnosis

## ABSTRACT

*Medical diagnosis has some difficulties that cause the physician mistakes during the process. Many of the difficulties are related to the vast amount of medical data, similarity of the symptoms for many of the diseases and physician skills and experiences. This chapter briefly explains the medical diagnosis definition and the useful techniques that help to improve the performance of the existing medical diagnosis systems. The reasons for importance and difficulties of medical diagnosis and web based medical diagnosis system components are explained and WISER as an example is provided.*

## 1 INTRODUCTION

For many years, medical diagnosis was an art among human society. There are famous physicians as well as famous painters or composers throughout the history. Again, what is the main job of an artist? A person who can carry out something that others cannot, and that is exactly what a professional physician does during a medical diagnosis procedure. Experts of medical science employ their educations, experiences, and talent, to diagnose a disease. A patient complaint is start of any diagnosis procedure and the expert learns more about the patient situation interactively during an interview, as well as by measuring some metrics such as blood pressure or the body temperature.

Whereas you need around five years to get your MSc or MA in other courses, you have to spend almost twice in a medical school to get your diploma. That simply suggests the complexity of the medical diagnosis. In each case, diverse symptoms generated by diverse causes should be considered and added to the patient background. Epidemics also should be considered and the genetic factors too, and then a diagnosis can be materialized. After a while, a physician would be more experienced, but just gradually and in one branch of diseases. However, there are still some problems.

Human is going to apply various methods in order to increase the quality of medical diagnosis. Especially computer-based approaches have important role in the area of medical services. There are two main categories for these computerized methods: first conventional techniques, such as database management systems (DBMSs), and second artificial intelligence (AI) techniques, such as knowledge-based systems (KBSs) or expert systems (ESs).

A part of medical diagnosis is related to diagnostic test that has seen an exponential increase in the accuracy and sensitivity in new decades. Diagnostic tests include observing external symptoms and using sophisticated laboratory tests and complex imaging methods that permit detailed non-invasive internal examinations. The improved methods for diagnostic tests cause providing accurate patient data to physician. A process of medical diagnosis is established when evidence to distinguish a probable cause of the patient's key symptoms from all other possible causes of the symptom is found. Various ranges of diseases such as cancer research, gastroenterology, heart diseases etc, use computer technology for medical decision support. Generically Decision Support Systems (DSS) are any type of application that support the decision making process. A generic DSS receives a certain amount of data as input, processes it using a specific methodology and offers as a result some output that can help decision-makers (Caruana, 1996).

AI methods are applicable for medical data mining. Therefore, it provides a tremendous opportunity for data mining methods to assist the physician to collect the medical data of each patients and scientific knowledge. Physicians can use medical data mining in a variety of ways, by using interpret complex diagnostic tests, by combining information from multiple sources (sample movies, images, clinical data, proteomics, scientific knowledge), by providing support for differential diagnosis and providing patient-specific prognosis. Therefore, it is logical to claim that AI can be very helpful for solving the problems of real world. In other words, data mining can be considered as a branch of AI to be applied for information extraction from patients' data. Essentially, Data mining gives information that would not be available otherwise. When the data collected involves individual people, there are many questions concerning privacy, legality and ethics.

The major problem in medical field is to diagnose disease. Human being always make mistake and because of their limitation, diagnosis would give the major issue

8 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/medical-diagnosis/110995

## Related Content

Machine Learning in Python: Diabetes Prediction Using Machine Learning
Astha Baranwal, Bhagyashree R. Bagweand Vanitha M (2020). *Handbook of Research on Applications and Implementations of Machine Learning Techniques (pp. 128-154).*
www.irma-international.org/chapter/machine-learning-in-python/234122

Complex-Valued Neural Networks for Equalization of Communication Channels
Rajoo Pandey (2009). *Complex-Valued Neural Networks: Utilizing High-Dimensional Parameters (pp. 168-193).*
www.irma-international.org/chapter/complex-valued-neural-networks-equalization/6769

Kolmogorovs Spline Complex Network and Adaptive Dynamic Modeling of Data
Boris Igelnik (2009). *Complex-Valued Neural Networks: Utilizing High-Dimensional Parameters (pp. 56-78).*
www.irma-international.org/chapter/kolmogorovs-spline-complex-network-adaptive/6764

Generative Adversarial Neural Networking of Agents: Avatars as Tools for Financial Modelling
Vladimir Soloviev, Vsevolod Chernyshenko, Vadim Feklin, Ekaterina Zolotarevaand Nikita Titov (2020). *Avatar-Based Control, Estimation, Communications, and Development of Neuron Multi-Functional Technology Platforms (pp. 107-120).*
www.irma-international.org/chapter/generative-adversarial-neural-networking-of-agents/244788

A Novel Moth-Flame Algorithm for PID-Controlled Processes With Time Delay
Shamik Chatterjeeand Vivekananda Mukherjee (2020). *AI Techniques for Reliability Prediction for Electronic Components (pp. 191-223).*
www.irma-international.org/chapter/a-novel-moth-flame-algorithm-for-pid-controlled-processes-with-time-delay/240498