

FREQUENCY DECISION THEORETICAL APPROACH TO AUTOMATED MEDICAL DIAGNOSIS

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1. Introduction

The recent availability of relatively large memory capabilities associated with high speed computers has given hope to the possibility of combating some of the obvious deleterious results of disparate growth rates of medical knowledge, numbers of physicians, and numbers of patients. The purpose of this investigation is to establish a method for arriving at a preliminary medical diagnosis by the use of computer techniques before the patient is seen by the physician. It appears, however, that the serendipitous result of discovering more insight into the diagnostic process may be of greater medical significance than the proposed reason for the study.

2. Logic of diagnosis

In the past few years many investigators, employing a variety of approaches, have directed their efforts towards establishing a model for computer assisted medical diagnosis [1] to [7]. A frequent attempt at automating the medical diagnosis process consists of analyzing and then simulating the physician's diagnostic procedure. One problem with the attempt at simulation is apparent when one considers that whatever method the physician uses (heuristic, intuitive, probabilistic, deterministic, and so forth) it has the fault that if a disease is not considered at any stage of the process, that disease cannot be diagnosed. It is not likely that any physician ever considers *all* diseases in making a diagnosis. A series of two decision determinations encompassing all the diseases one wishes to consider obviates this problem.

Analyses of the currently employed physician diagnostic procedures reveals some interesting findings. There are inconsistencies in the current concepts of the diagnostic procedure. However, before these can be discussed it would be

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