

A Framework for Early Differential Diagnosis of Tropical Confusable Diseases Using the Fuzzy Cognitive Map Engine

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Abstract : The overarching aim of this study is to develop a soft-computing system for the differential diagnosis of tropical diseases. These conditions are of concern to health bodies, physicians, and the community at large because of their mortality rates, and difficulties in early diagnosis due to the fact that they present with symptoms that overlap, and thus become 'confusable'. We report on the first phase of our study, which focuses on the development of a fuzzy cognitive map model for early differential diagnosis of tropical diseases. We used malaria as a case disease to show the effectiveness of the FCM technology as an aid to the medical practitioner in the diagnosis of tropical diseases. Our model takes cognizance of manifested symptoms and other non-clinical factors that could contribute to symptoms manifestations. Our model showed 85% accuracy in diagnosis, as against the physicians' initial hypothesis, which stood at 55% accuracy. It is expected that the next stage of our study will provide a multi-disease, multi-symptom model that also improves efficiency by utilizing a decision support filter that works on an algorithm, which mimics the physician's diagnosis process.

Keywords : medical diagnosis, tropical diseases, fuzzy cognitive map, decision support filters, malaria differential diagnosis

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