DYNAMIC DECISION MODELS FOR CLINICAL DIAGNOSIS

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In this paper a unified approach to clinical decision making is presented. This combines partially observable Markovian decision processes (Markov or semi-Markov) with cause-effect models as a probalistic representation of the diagnostic process. Pattern recognition techniques are used in a first stage of system state identification.

This new class of dynamic models has a direct application to medical diagnosis and treatment and specific physiological examples are emphasised.

The methodology is given for combining the patient state of health, the clinician's state of knowledge of the cause-effect representation from the observation space (measurements), feature selection using pattern recognition techniques and finally the treatment decisions with which to restore the patient to a more desirable state of health. A cost functional for the decision process has then to be optimised according to some pre-assigned objective function (social return from the patient state of health or treatment cost for the patient), when the process has an infinite time horizon.