

DEVICE FOR HYPOTHERMIC THERAPY BASED ON FUZZY LOGIC RULES

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Hypothermia for therapeutic purposes is used for its cooling effect on some areas of patient's body, in order to reduce the risk of ischemic tissue trauma after a period of insufficient blood supply [1]. Period of insufficient supply with blood may be caused by heart failure or blockage of arteries when an embolism occurs, as it is usually happens after a stroke. Studies have shown that patients under risk for ischemic brain injury present better results using hypothermic methods of treatment [2]. This studies where focused on researching ischemic accidents that unlike usual strokes reduces coagulation threshold. This researches shown that hypothermia used in therapeutical purposes has a neuroprotective effect [3]. Studies showed as well that use of therapeutic hypothermia in order to control intracranial pressure (ICP) after an ischemic stroke is a safe and feasible procedure [4]. Medical therapeutic hypothermia may be implemented using invasive techniques, where heat transportation is directed by a catheter inserted into femoral vein, or through noninvasive methods when usually is used water/ice. To achieve the required temperature, patient's torsos are covered with specific applications or with sheets soaked with water which are in direct contact with patient's skin. For primary experiments are used 4 cooling elements and further their number increase to 20 which should be enough to cool the blood flow. For control of temperature we will use sensors placed near ears, neck and nose fig.1 (a). Routing algorithms will be based on Fuzzy logic rules [3] which in present are developed in collaboration with medical officers from their specific domain. Fuzzy logic rules will allow smart routing of temperature reducing inertia of reaction system fig.1 (b) [4].

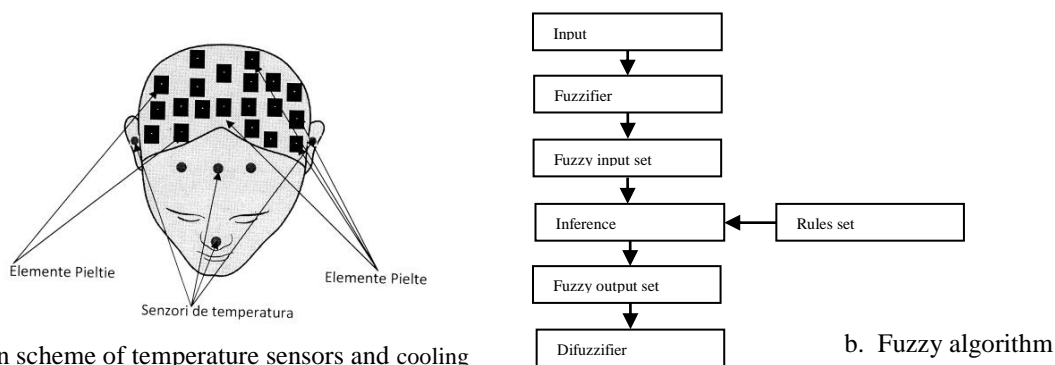


Figure 1.

Fuzzy set theory, basic ideas that were suggested by American mathematician Lotfi Zadeh allows us to describe the inexact concepts in our knowledge of the word, as well as offers opportunities in order to gain new information. The methods based on this theory allow to obtain information models, greatly extend the feels of traditional computers and applied research, which received a special name- „fuzzy modeling” [5].

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