521 E1

A new theory for conflict resolution in expert systems

Expert systems possess a unique feature that they can decide on the firing order of rules. In natural human reaction, choice of rules depends on the emotional status of the people in interaction. In this sense, research into incorporation of emotional aspects with expert system technology is of great importance. This paper presents an approach to represent emotional factors in expert systems.

According to Buddhism mind is considered as a flow of thoughts that deals with a set of consciousness say *C*, which is characterized by a set of mental factors or emotions *M*. With regard to average human being, there exists a set of consciousness Cs.C, for some *s*. The operation on consciousness *Csk* ,...,*Csl*.*C*s, leads to form a new consciousness, *Csm*.*C*s with some mental features. In our research we have identified a set of emotions *E* = {*E*i=(*e*1,*e*2,….,*e*j,...,*e*15)|*e*j=0 or 1} that characterize *C*s. Further, the modeled emotion vector (*e*1,*e*2,….,*e*j,...,*e*15) has three distinct partitions, i.e.((*e*1,..,*e*5),(*e*6….,*e*12),(*e*13...,*e*15)) and some *e*i…*e*j have mutual dependencies. The rule base of the system developed is initialized with such emotion vectors. Once a user chooses an answer the system assigns an emotional value *E*a for it. The emotion vectors *Eri*,…,*Ern* of conflict set mute with *E*a. The resultants are diverted in to a pool of emotion vectors. The dominating vector (*E*d) in the pool of emotions is compared with *Eri*,…,*Ern* such that for any *k*. (*i*,...,*n*), |*Erk*-*E*d| is a minimum. The rule with such a minimum emotional distance with *E*d fires. Also, *E*d will be the next candidate for *E*a at the next cycle.

In the evaluation of the system the expert knowledge of an academic counselor, guiding students in course selection at their degree level, is embedded in the knowledge base. The system is evaluated using a group of students and two student counselors. Each student is allowed to interact with the system and a human counselor alternatively, followed by a questionnaire. The system was capable of convincing the effect of emotions in the conflict resolution technique with a human to system proportion of fifty-seven to forty three, which is seven percent away from the equality condition of fifty to fifty percent.