KNOWLEDGE MODELING IN TRADITIONAL CHINESE MEDICINE WITH FUZZY INFLUENCE DIAGRAMS

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ABSTRACT. *Traditional Chinese medicine (TCM) has been developed for more than four thousand years. It is a complete medical system embracing diagnosis, treatment and prevention. However, the knowledge of TCM is linguistically vague and usually involves subjective judgments, which makes automated inference challenging. This study proposes a novel approach for knowledge modeling in TCM, fuzzy influence diagrams (FID). Considering the subjective knowledge as well as linguistic fuzziness in TCM, possibility distributions are used to model the uncertainty and causal relationships in influence diagrams, which extend the conventional influence diagrams into fuzzy influence diagrams. The FID provides a general platform for answering various queries in TCM, such as prognosis, diagnosis, and optimal treatment. The FID can bridge the qualitative fuzziness and quantitative numerical models in knowledge bases for TCM.*
Keywords: Traditional Chinese medicine, Knowledge models, Fuzzy influence diagrams, Possibility distributions

1. **Introduction.** Traditional Chinese medicine (TCM) originated from China and has been developed for more than four thousand years. It is a complete medical system embracing diagnosis, treatment and prevention. The domain of TCM is accumulated from (1) the ancient philosophy of China, such as *Yin-Yang* Theory, the theory of *Five-Phase* or *Five-Element*, and so on; (2) the phenomena and interaction of the Nature, such as astronomy, agriculture, meteorology, mathematics, and so on; and (3) long term experiences and dialectical approaches [4, 7].

However, the knowledge of TCM is linguistically vague and usually involves subjective judgments, which makes automated inference challenging. This study proposes a novel approach for expressing the knowledge in TCM, fuzzy influence diagrams. An influence