

Research on Computational Intelligence Methods for Building Reasoning Models and Application in Eight-Principle Diagnosis

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Abstract: This study proposes a computational intelligence framework for constructing reasoning models based on the principles of Bát Cương (Eight Principles) in Traditional Vietnamese Medicine and evaluates its application in automated diagnosis. Traditional diagnostic methods rely heavily on expert intuition and qualitative pattern recognition, which limits scalability and consistency. To address this, we integrate fuzzy logic and neural network architectures to formalize the dialectical reasoning process inherent in Bát Cương. The model captures the complex, non-linear relationships among clinical symptoms and the eight principal diagnostic categories (e.g., exterior/interior, cold/heat, deficiency/excess, yin/yang). Experimental validation using a curated clinical dataset demonstrates that the proposed approach achieves high diagnostic accuracy and interpretability, outperforming conventional machine learning baselines. Furthermore, the model provides transparent reasoning pathways that align with expert clinical logic. These findings suggest that computational intelligence can effectively bridge traditional medical theory and modern AI, offering a robust tool for clinical decision support in Vietnamese Medicine.

Keywords: Computational Intelligence, Argumentation Model, Diagnosis, Eight Principles