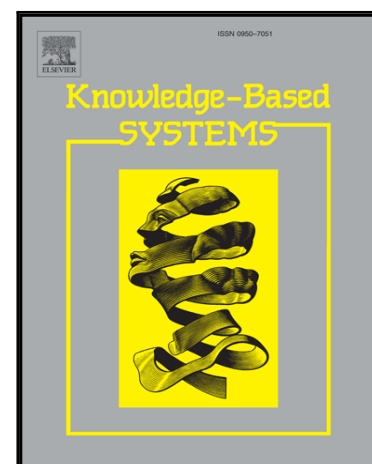


Three-way Decision Support for Diagnosis on Focal Liver Lesions

Yufei Chen, Xiaodong Yue, Hamido Fujita, Siyuan Fu

PII: S0950-7051(17)30184-3
DOI: [10.1016/j.knosys.2017.04.008](https://doi.org/10.1016/j.knosys.2017.04.008)
Reference: KNOSYS 3888



To appear in: *Knowledge-Based Systems*

Received date: 24 January 2017
Revised date: 26 March 2017
Accepted date: 22 April 2017

Please cite this article as: Yufei Chen, Xiaodong Yue, Hamido Fujita, Siyuan Fu, Three-way Decision Support for Diagnosis on Focal Liver Lesions, *Knowledge-Based Systems* (2017), doi: [10.1016/j.knosys.2017.04.008](https://doi.org/10.1016/j.knosys.2017.04.008)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Three-way Decision Support for Diagnosis on Focal Liver Lesions

Yufei Chen^{a,*}, Xiaodong Yue^{b,*}, Hamido Fujita^c, Siyuan Fu^d

^a*College of Electronics and Information Engineering, Tongji University, Shanghai 200092, China*

^b*School of Computer Engineering and Science, Shanghai University, Shanghai 200444, China*

^c*Iwate Prefectural University, Faculty of Software and Information Science, Iwate, Japan*

^d*Eastern Hepatobiliary Surgery Hospital, Shanghai, China*

Abstract

Malignant Focal Liver Lesion (FLL) is a main cause of primary liver cancer. In most existing Computer-Aided Diagnosis (CAD) systems of FLLs, machine learning and data mining methods have been widely applied to classify liver CT images for diagnostic decision making. However, these strategies of automatic decision support depend on data-driven classification methods and may lead to risky diagnosis on uncertain medical cases. To tackle the drawback, we expect to integrate the objective judgments from classification algorithms and the subjective judgments from human expert experiences, and propose a data-human-driven Three-way Decision Support for FLL diagnosis. The methodology of three-way decision support is motivated by Three-way Decision (3WD) theory. It tri-partitions the FLL medical records into certain benign, certain malignant and uncertain cases. The certain cases are automatically classified by decision rules and the challenging uncertain cases will be carefully diagnosed by human experts. Therefore, the method of three-way decision support can balance well the risk and efficiency of decision making. The workflow of three-way decision support for FLL diagnosis includes the stages of semantic feature extraction, three-way rule mining and decision cost optimization. Abundant experiments demonstrate that the proposed three-way decision support method is effective to handle the uncertain

*Corresponding author.

Email addresses: april337@163.com (Yufei Chen), ywantfly@gmail.com (Xiaodong Yue)

Download English Version:

<https://daneshyari.com/en/article/4946205>

Download Persian Version:

<https://daneshyari.com/article/4946205>

[Daneshyari.com](https://daneshyari.com)