A Computer Aided Instruction System for the International Law CISG

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A computer aided instruction system for the international law has been developed. This project has been supported by the Japanese Ministry of Education, Science, and Culture since 1992. It aims a basic education in the department of law, where users are supposed to be beginners both in law and computer.

Generally speaking, knowledge representation and similarity measure play an important role in classifying vague legal concepts. In the conventional legal reasoning systems, fuzziness has not been deeply considered, especially in the legal knowledge representation, and the similarity measures are not sufficiently investigated because they cannot give a context-sensitive similarity measure. From such viewpoints a fuzzy legal expert system (FLES) based on similarity measure is constructed, where the target law is the United Nations Convention on Contracts for the International Sale of Goods (CISG). It aims to classify vague legal concepts in the CISG and support the education for the beginners of international law.

The FLES is composed of fuzzy legal case-based reasoning (FLCBR) module and fuzzy legal argument (FLA) module. The former provides a primary study on vague legal concepts. The latter is the extension of the former, and can make an argument between plaintiff and defendant. The fuzziness and context-sensitive effects are taken into account in the knowledge representation and similarity measures in these two modules. In FLCBR, a hierarchical fuzzy frame is introduced to represent the case that is composed of issues, features and case rules. The similarity measure in the case of retrieval and inference is based on the newly introduced Hausdorff distance-based similarity measure. In FLA, a fuzzy factor hierarchy is studied to represent the case that is composed of

issues, abstract factors and atomic factors. The legal argument consisting of claim, objection and rebuttal, that reflect the viewpoints of plaintiff and defendant, is modeled by the factor-based similarity measure that is a structural similarity measure integrated the Hausdorff distance-based similarity, the fuzzy extension of the feature-based similarity and the newly proposed context-based similarity. The context-based similarity is proposed in order to evaluate the significance of the similarity /distinction measured by the distance-based and feature-based similarity measures.

In the proposed system, the fuzzy legal reasoning considering the fuzziness and context-sensitive effects is realized, and is applied to the CISG. This work developed the basic study of the legal reasoning method, and established a foundation of intelligent legal reasoning system for the beginners of the field of international law.

Related works

[1] Kaoru Hirota, Hajime Yoshino, Mingqiang Xu: “An Application of Fuzzy Theory to the Case-Based Reasoning of the CISG”, Journal of Advanced Computational Intelligence, Vol.1, No.2, pp.86-93, 1997

[2] Hajime Yoshino, Mingqiang Xu, Kaoru Hirota:” A Fuzzy Judgement Approach to Inference of Cases in CISG”, The Sixth International Conference on Artificial Intelligence and Law, Australia, pp.60-64, 1997/6

[3] Mingqiang Xu, Kaoru Hirota, Hajime Yoshino: ”Learning Vague Concepts and Making Argument from Examples by Fuzzy Factors in Interpretive Knowledge-Based System”, The Fifth International Conference on Soft Computing and Information/Intelligence Systems, Japan, pp.191-194, 1998/10

[4] Mingqiang Xu, Kaoru Hirota, Hajime Yoshino: ”A Fuzzy Theoretical Approach to Representation and Inference of Case in CISG”, International Journal of Artificial Intelligence and Law, Vol.7, No.2-3, pp.259-272, 1999