Vi-sit Boonchom 2012: Automatic Thai Legal Ontology Building and Supreme Court Sentences Retrieval Using Ant Colony Algorithm. Doctor of Philosophy (Computer Science), Major Field: Computer Science, Department of Computer Science. Thesis Advisor: Associate Professor Nuanwan Soonthornphisaj, Ph.D. 102 pages.

Ontology plays an important role in knowledge representation, especially in the domain of information retrieval. However, building ontology remains a challenging problem because it is a time-consuming task for experts. To overcome this problem, an Automatic Thai legal Ontology Building algorithm is proposed in order to reduce the burden of legal experts and to fulfill the criteria for a complete appreciation for users of legal documents. Moreover, users, especially law students, require a set of updated and diversified sentences from the court sentences retrieval process to ensure a comprehensive legal knowledge related to specific keywords. Unfortunately, some of the outdated and non diversified sentences are still yielded. Therefore, a Combination of the Ant colony algorithm and the Ontology algorithm is proposed in order to address such a predicament.

The Automatic Thai legal Ontology Building algorithm can automatically generate seed ontology and expand the ontology with the application of the Thai legal terminology. The expansion process is terminated automatically by the threshold parameter. Moreover, the *weight ontology* is modified to support both algorithms. The concept of ant colony algorithm is applied with the ontology in order to retrieve the updated and diversified sentences. Both algorithms are tested with the Thai court sentences repository. Empirical results demonstrate that the effective ontology should be an embedded ant colony algorithm. The performance of both algorithms measured in terms of the precision, recall, F-measure and diversity value are 0.95, 0.94, 0.94 and 0.40, respectively.

Student's signature

Thesis Advisor's signature