

## ABSTRACT

The case-based reasoning (CBR) uses an existing case to solve the new target problem by performing two processes: retrieve the similar case and adapt an existing case to a new one. When the case base is growing, the uncontrolled case-based size can cause serious performance problems such as the duplicate case, inconsistent case and a swamping problem. Therefore, the maintenance process, which can be called as Case-based maintenance (CBM), is required. However, there are several alternatives to maintain the case base, for example, addition policy, deletion policy, and edition policy.

The main problems of CBM are competence, efficiency, and quality. Additionally, there are some constraints (e.g. case-based size, time consumption). This thesis concentrates on how best to handle the case-based size, problem solving time, maintenance time and total time. Furthermore, the techniques in this thesis also focus on the competence preservation and an ability to solve of CBR. They are confidential case filtering (CCF), coverage value algorithm (CVA), confidential coverage (CC), and coverage value case base filtering (CVCBF).

The experimental results in this thesis clearly show that the implemented techniques preserve the competence and reduce the case-based size and time consumption, for instance, the coverage value algorithm is a algorithm that is suitable for any system concerning directly to the time consumption and case-based size. In other words, each implemented techniques is used for each situation.