

University of Macau

Abstract

CASE-BASED ADAPTATION APPLIED TO HYDRAULIC
CIRCUIT DESIGN

by Vong Chi Man

Thesis Supervisor: Professor Otakar Babka
Software Engineering

Case-based reasoning (CBR) is an emerging methodology in *Artificial Intelligence* (AI) whose main purpose is to retrieve and reuse analogical existing experience to solve current problem. In the past, most of the research and development concentrate on stage of retrieval and similarity of problem pairs, but not much attention has been drawn on the subsequent and more important part — adaptation. This thesis addresses the problems of adaptation and briefly reviews the existing adaptation methods. Then a new technique of adaptation, *case-based adaptation* (CBA), is described and an industrial problem domain of *hydraulic circuit design* is selected to illustrate the usefulness of the new adaptation technique (CBA). Hence the objective of the research is set to implement and verify the concept of case-based adaptation. In addition, the implementation of an evolving knowledge representation is also one of the goals of the research.