# Development of Concepts and Methodologies for the Representation of Contextual Information in Knowledge Based Systems

*a master degree thesis by*

Jacob Lech Cybulski

*Royal Melbourne Institute of Technology*
*Department of Computer Science*
*Melbourne, Victoria*
*Australia*

*March 1987*

## Abstract

One of the major problems in Knowledge Based Systems is the ability to selectively acquire, manipulate and subsequently retrieve knowledge. This selectivity has been recognised as an issue related to knowledge representation and inference, and it has frequently been dealt with by a specialised module of a knowledge based system - the context mechanism. This thesis discusses the available tools and methodologies used for capturing and maintaining knowledge structures aiding the operation of context mechanisms. It also proposes new knowledge representation techniques addressing various aspects of context manipulation relevant to Knowledge Based Systems. A working computer program Contextus is described. It is based on the concepts of frame representation systems, message passing and spreading activation. The program also features a multi-hierarchical taxonomy of concepts, points of view, context chains, and concept activation and inhibition. The power and flexibility of the system is illustrated by numerous examples related to robot construction and action planning.