

A Software Framework to Integrate Vision and Reasoning Components for Cognitive Vision Systems

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Abstract—In this very nice paper the importance of integration for Cognitive Vision Systems (CVS) is highlighted. CVS set out to solve tasks such as interpreting the activities of persons or groups of persons or providing robots with means to act autonomously. What these applications both require is the use of a large number of functionalities, e.g., perception-action mapping, recognition and categorisation, prediction, reaction to actions, symbolic interpretation, and communication to humans or other systems. Within this contribution these cognitive vision functionalities of a CVS are encapsulated in components. To arrive at the level of building a system from these functionalities it is considered essential to provide a framework that coordinates the components. In the course of the ActIPret project, such a framework has been developed and demonstrated. The framework is built on two principles to organise the components: (1) the service principle uses a "yellow pages" directory to announce its capabilities and to select other components, and (2) the hierarchy principle orders components along data abstraction from signal to symbolic levels and ascertains that system response is reactive. ActIPret shows the interpretation of a person handling tools involving functionalities such as tracking, object and gesture recognition, spatial-temporal object relationships and reasoning to extract the symbolic description. To move towards other multi-task CVS we invite the reasearch community to exploit this framework and to exchange components and framework.

I. INTRODUCTION

II. MOTIVATION

III. RELATED WORK

IV. APPROACH

V. EXPERIMENTAL EVALUATION

VI. CONCLUSIONS

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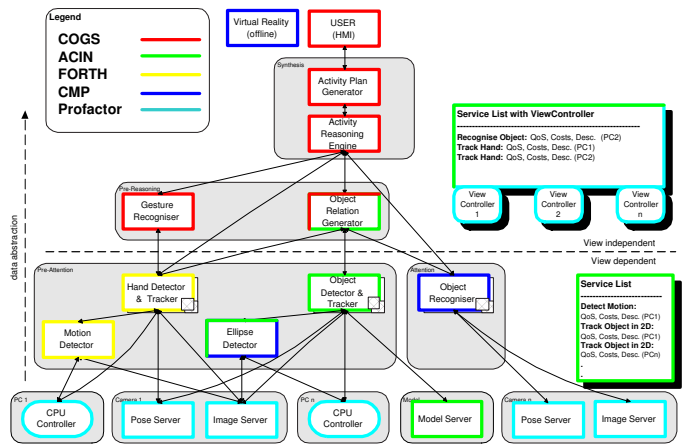
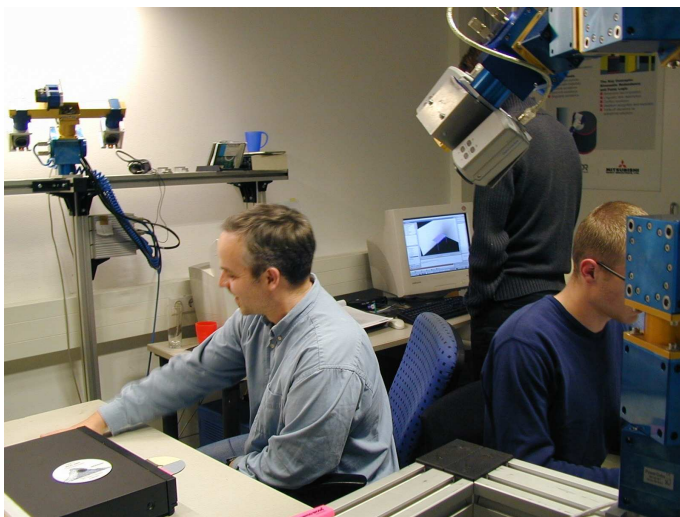


Fig. 1

LEFT: THE ACTIPRET DEMONSTRATOR. TOP LEFT IS THE ACTIVE FIXED STEREO SYSTEM, TOP RIGHT THE STEREO SYSTEM ON THE ROBOT ARM. THE SCREEN IN THE BACKGROUND SHOWS THE GUI OF THE FRAMEWORK WHILE JON HOWELL (FROM THE ACTIPRET PARTNERS FROM THE UNIVERSITY OF SUSSEX) IS PLACING A CD IN THE PLAYER. RIGHT: THE STRUCTURE OF THE ACTIPRET DEMONSTRATOR BUILT UP USING THE SOFTWARE FRAMEWORK DESCRIBED IN THIS PAPER.