On The Role of The Cases in Case-Based Planning

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Abstract. One of the first CBR systems was CHEF, a case-based planner that reuses cooking recipes for creating new ones. Since then, a wide variety of applications of case-based planning (CBP) have been proposed including manufacturing, military planning and emergency prediction. In this talk, the speaker will discuss the evolution of the role of the cases in CBP. In early CBP systems like CHEF, cases provide domain knowledge. Later, cases provided control knowledge to guide first-principles planners. More recently, the speaker has developed a theory explaining how cases can play both roles. This theory facilitates the use of CBP for a number of new applications including project planning and plan discovery.

1 Introduction

Planning, generating a sequence of actions meeting pre-defined specifications, was one of the earliest problems targeted by case-based reasoning (CBR) (Hammond, 1989). Since then, case-based planning (CBP) has been a recurrent research topic covering a wide range of application areas including manufacturing (Kambhampati, 1994; Bergmann & Wilke, 1995; Muñoz-Avila & Weberskirch, 1996), military planning (Mitchell, 1997; Muñoz-Avila et. al. 1999), route planning (Haig & Veloso, 1995; Branting & Aha; 1995) and emergency prediction (Avesani et. al., 1993).

Cases in early CBP systems such as CHEF contain domain knowledge; in such systems, cases provide instances of successful problem-solving episodes that can be used to cope with the absence of a domain theory. Later, research on CBP has concentrated on guiding first-principles planners. Cases in these systems provide meta-knowledge on how to use the domain theory to solve new problems efficiently (e.g., (Veloso, 1995)). More recently, we developed a theory that explains how cases can play both roles (Muñoz-Avila et. al., 2001). This theory facilitates the use of CBP for a number of new applications including project planning ((Muñoz-Avila et. al., 2002) and Plan Discovery.

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