

Automatic Planning System for Activity Management to Help People with Special Needs

Abstract

This thesis presents a system that helps elderly and people with special needs to manage their daily activities in term of time. The thesis also presents algorithms that receive the activities of the user and manage them to introduce them again to the user as a well-managed plan, There are four planning algorithms: planning daily activities using genetic algorithms, one in which there are temporal constraints and one in which there is no temporal constraints and depends only on the relationship between the activities. Planning using constraints satisfaction problem is the second presented algorithm, the thesis is introducing the CSP algorithm in a modified way in order to consider the temporal constraints. The third and fourth algorithms are built by combining GA and TCSP, thus we got TCSP-GA and TCSGS, the headmost, apply GA on a population created using TCSP, while the latter uses GA to solve a problem described as TCSP instead of using classical techniques.

All the genetic algorithms deal with the plans as candidates and with the activities as genes, such that each valid candidate is a possible solution for the algorithm. The algorithms that use GA has two ways of crossover, the standalone GA the crossover is done between two candidates without referring to the domain, while when using GA to solve TCSP the crossover is done between each candidate and the domain of each variable in the candidate. The function that is used to check the fitness of the candidates relays on the how well the algorithm succeed to build a valid plan and how are the activities in this plan are distributed to hold the user's requirement.

In addition, the thesis presents a multimodal interface that facilitates the presentation of the plan to the user, and let him add or delete activities, besides a communication agent that send and receive emails from the caregivers which we called them here as external agents, the email service will let the external agent to send their orders, and the communication agent will extract this orders to be planed

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