

Towards the Individual-centered Re-scheduling of Activities

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Abstract.

Rescheduling is an important part during the simulation of household daily pattern. It mainly used the activity-based model to forecast individuals traveling demand, including activity type, duration, start and end time, participants involved in the activity. Also, lots of researches study how to simulate daily pattern, there are agent-based models to simulate the travel of pedestrians, cars, motorcycles, trains etc. While, there are some impetuses for individuals to change the original plan during executing, when it happens, how to reschedule becomes necessary. This research takes each individual as an agent, agent can make a decision according to the information it received and follow certain rules.

[CD09] put forward that there are mainly four impetuses for individuals to reschedule, they are time conflict, personal choice, personal needs and interpersonal choices. We can conclude it as two, to reschedule for objective reason or subjective reason. When rescheduling, activity type is an important factor, normally only the flexible activities can be rescheduled, mandatory activities like work and school cannot be modified. For the ways to reschedule, there are mainly changing location, changing transport mode, shortening the duration and canceling the activity, sometimes inserting an activity and substitute an activity also happens. Not only the type of activity, but the attributes of participated person affect how to reschedule, like the gender, age, job, they all cause the different preference to choose the rescheduling way. [NA09] elaborate that the choices for rescheduling vary from different activities. For example, compared with daily shopping or social visit, walking green or touring bike have no choice to change mode. Time pressure also affects individuals rescheduling decisions, we will regard it as one individuals characteristic. When defining the weight for each choice, the characteristics of individual and attribute of activity should both be considered. When the an activity involves more than one person, participants need to negotiate with each other to make a decision, this kind

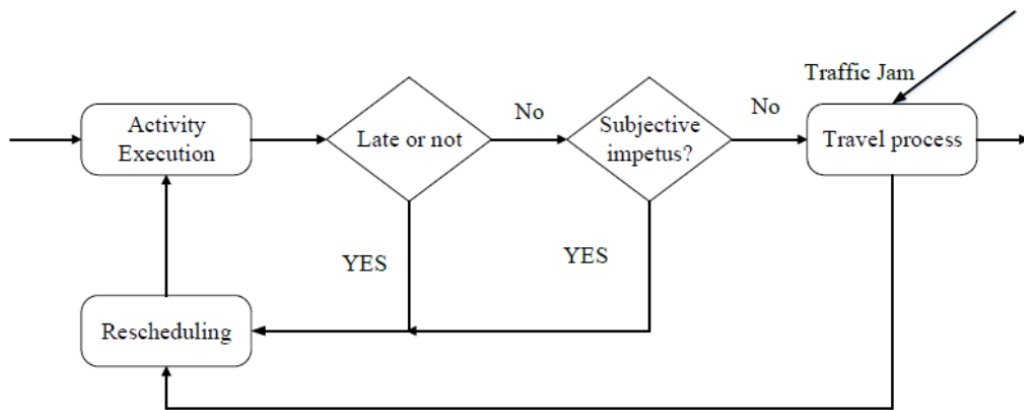


Figure 1: Rescheduling Process

of situation can be regarded as carpooling, and there will be negotiation between these the involved person. There is not too much about this area, how to model this will be discussed in future. Whats more, there must a way to justify the new schedule. Apart from the activity utility, since individual has a willing avoiding tedious modification, keep the similarity to the previous plan is essential. In the model of Household Activity Pattern Problem (HAPP), [GR08] study the household schedule similarity, and they think similarity is more important than utility. In most models, researchers assume individual act independently, while, since this research takes the carpooling into consideration, individual is affected by others, it will consider the household schedule similarity.

As illustrated by Fig. 1, the simulation of schedule consists of two parts: activity execution and travel process. When an activity is finished, agent can tell it ends late or not, it will return to reschedule if yes, if not, agent will tell if there is a subjective reason to reschedule, such as personal needs or interpersonal needs. It will return to reschedule if yes, agent will be on the travel to the next activity location if not. During the travel process, agent have the access to receive the traffic information, if it is aware of traffic jam, it will decide to reschedule. There will be a fussy model to define late, different activity has different late standard. The skeleton of rescheduling is as follows.

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