Using Genetic Process Mining Technology to Construct a Time-interval Process Model

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ABSTRACT

Nowadays, some process information is represented by a process model. To understand process executed in many activities, process mining technologies are now extensively studied to understand the relations and sequences between events (tasks). However, three major problems in the current process mining techniques are identified. First, the problems such as invisible tasks, noisy and non-free choice constructs and so on are difficult to be handled and current process mining techniques mainly based on the local search strategy which is to build the process model with information step by step. Second, time stamp are not considered so that the patterns with different time-intervals are regarded as the same behaviors. Third, there is no precision evaluation measure to evaluate the quality of process models in existing process mining techniques. To solve these difficulties, this research proposes a time-interval process mining method which considers time-interval between tasks. Furthermore, to solve the process mining techniques mainly based on the local search strategy to discover the process model and the discovered process model may contains the problems such as invisible tasks, noisy and non-free choice constructs, a genetic

process mining method with global search strategy is applied. However, to evaluate the quality of the process models constructed by different combinations of parameters such as the population size, the number of generation, crossover rate and mutation rate in the genetic process mining method, a precision evaluation measure is proposed. Finally, a best process model with highest quality is selected to manage the real events (tasks).

Keyword: Process Mining, Genetic Algorithm, Time-interval