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Action rule discovery from incomplete data

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Abstract Action rule is an implication rule that shows the expected change in a decision value of an object as a result of changes made to some of its conditional values. An example of an action rule is 'credit card holders of young age are expected to keep their cards for an extended period of time if they receive a movie ticket once a year'. In this case, the decision value is the account status, and the condition value is whether the movie ticket is sent to the customer. The type of action that can be taken by the company is to send out movie tickets to young customers. The conventional action rule discovery algorithms build action rules from existing classification rules. This paper discusses an agglomerative strategy that generates the shortest action rules directly from a decision system. In particular, the algorithm can be used to discover rules from an incomplete decision system where attribute values are partially incomplete. As one of the testing domains for our research we take HEPAR system that was built through a collaboration between the Institute of Biocybernetics and Biomedical Engineering of the Polish Academy of Sciences and physicians at the Medical Center of Postgraduate Education in Warsaw, Poland. HEPAR was designed for gathering and processing clinical data on patients with liver disorders. Action rules will be used to construct the decision-support module for HEPAR.

Keywords Action rule · Rule discovery · Incomplete information system · HEPAR

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