



Kolloquiumsvortrag

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A first-order policy language for history-based transaction monitoring

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Online trading invariably involves dealings between strangers, so it is important for one party to be able to judge objectively the trustworthiness of the other. In such a setting, the decision to trust a user may sensibly be based on that user's past behaviour. We introduce a specification language based on linear temporal logic for expressing a {em policy} for categorising the behaviour patterns of a user depending on its transaction history. We also present an algorithm for checking whether the transaction history obeys the stated policy. To be useful in a real setting, such a language should allow one to express realistic policies which may involve parameter quantification and quantitative or statistical patterns. We introduce several extensions of linear temporal logic to cater for such needs: a restricted form of universal and existential quantification; arbitrary computable functions and relations in the term language; and a ``counting'' quantifier for counting how many times a formula holds in the past. We then show that model checking a transaction history against a policy, which we call the history-based transaction monitoring problem, is PSPACE -complete in the size of the policy formula and the length of the history. The problem becomes decidable in polynomial time when the policies are fixed. We also consider the problem of transaction monitoring in the case where not all the parameters of actions are observable. We formulate two such ``partial observability'' monitoring problems, and show their decidability under certain restrictions.

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Dr Rajeev Gore ist Senior Research Fellow in der School of Computer Sciences der Australian National University und Leiter der Automated Reasoning Group. Er promovierte 1992 am Computer Laboratory der Universität Cambridge, UK. Seine Arbeitsgebiete sind Modal und Temporallogik mit Anwendungen im Informatik.

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