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projet STIC Tunisie Brick

Sujet : Vérification de type pour un standard de mises à jour de documents XML.
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Lieu : équipe-projet DAHU du centre INRIA Saclay - Île-de-France,
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Context : The XML query language XQuery has been extended to the XQuery Update Facility [1] in order to provide convenient means of modifying XML documents or data. The language is a candidate recommendation from the World Wide Web Consortium (W3C) and adds imperative operations that permit one e.g. to update some parts of a document while leaving the rest unchanged. This includes rename, insert, replace and delete primitive operations at the node level. Compared to other transformation languages (such a XSLT), XQuery Update Facility is considered to offer concise, readable solutions.

A central problem in XML document processing is static typechecking. This problem amounts to verifying at compile time that every output XML document which is the result of a specified query or transformation applied to an input document with a valid input type, has a valid output type. However for transformation languages such as the one provided by XQuery Update Facility, the output types are not easy to predict.

Another important issue for XML data processing is the specification and enforcement of access control policies. A large amount of work has been devoted to secure XML querying. But most of the work focus on read-only rights, and very few have considered update (read/write) rights for a model based on XQuery Update Facility operations [2,3].
In a preliminary work [4], motivated by the problem of static analysis of XML updates under access control, we consider the problem of typechecking arbitrary sequences of operations taken in a given set of atomic update primitives. This work relies on a formal model based on the theories of term rewriting and tree automata.

**Objectives**: The subject of this internship is to refine the approach for the type checking of XQuery Updates, using a model closer to the real specification [1]. For this purpose, we intend to adopt the abstract model proposed in [5] for the study of the query-update independence problem, and to adapt our automata based methods for solving the type checking problem in this model.

We are planning to identify the right regularities in the model, or at default relevant regular approximations, and to develop type checking algorithms with a tractable complexity, based on tree automata constructions, like in [4].

If time permits, an implementation of the method and experiments will be conducted on some real updates functions.

**References**:


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