MCHA SPAIDA:
A Cooperative Query Editor with Anonymous Helpers using Ontology Mappings

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Abstract. In this paper, we propose our prototype system, named MCHA SPAIDA, that allows us for cooperatively editing SPARQL queries by the help of anonymous helper users without revealing the detailed meaning of the query. This system dynamically generates ontology mappings to translate a modified query by using a query and some data on an endpoint. Ontology matching approaches have been applied to effectively anonymize the query to be cooperatively edited by other users without loss of semantic relations among data and vocabularies. To make ease of cooperative tracing and profiling of a query, our method will not directly modify the queries and given ontology mappings. Rather, our method tries to add a small amount of supplemental ontology mappings to effectively anonymize the meaning of original query.

Keywords: SPARQL, ontology mapping, cooperative query editing, privacy protection, query anonymization

1 MCHA SPAIDA

To overcome the issues, we are implementing a system named MCHA SPAIDA[3], which is an extended version of our previously implemented system SPAIDA for utilizing ontology mappings on SPARQL queries[1–3] which also includes anonymous helper mechanism MCHA for cooperatively editing and sophisticating queries. Our system includes an "on-the-fly" ontology and instance matcher to evaluate the used ontology mappings and instance mappings, suggests which mappings will be used in the query. Furthermore, the on-the-fly matcher can also be used to interactively add one-time mappings that could produce more complete answer in the results of the specified query [1].

We are implementing a prototype system as a web application with SPARQL query editors and anonymous helpers. In order to utilize alignments as mapping data by using ontology matching tools (e.g., Alignment API [4]) and instance

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[3] A demo is available at http://whitebear.cs.inf.shizuoka.ac.jp/spaida-demo/

matching tools (e.g., ScLink [5]), SPAIDA prepares mapping repositories to the outside.
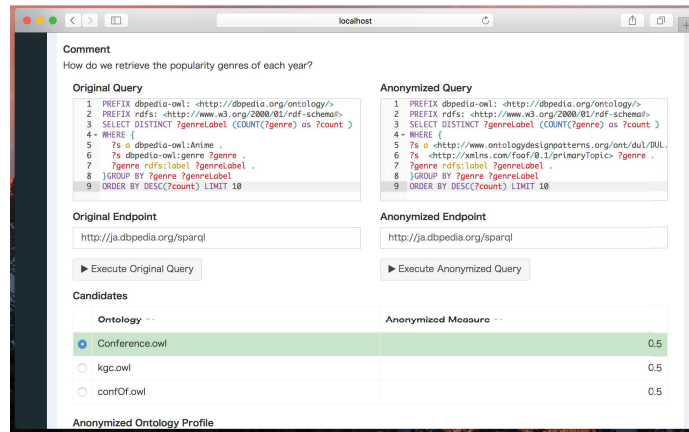
Figure 1 shows an overview of our implementing system.

Fig. 1. An overview of our implementing system

2   Dynamic Mapping Generation

An application of the on-the-fly mapping generation mechanism is MCHA (Mapping-based Conversion for Human-based query writing Assistance), which rather convert a query to another query which targets to completely different things while it tries to keep their attributes in the sense of complexity and structure of the output. This allows anonymous cooperative helper editing of a query while mitigating the targets the original user is trying to access. In this mechanism, some users are asked to help editing and enhancing a query of mapping-based conversion of a query to a "semantically equivalent or very similar" query.

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