Linked Data Seminars for Computer Scientists and Software Engineers

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1. Abstract

In 2015, the ADAPT Centre noticed an increasing demand in Linked Data technologies from industry partners. Principal Investigators from various disciplines within the center furthermore saw these technologies being mentioned as suitable data integrators.

As postgraduate students and research engineers were usually not exposed to Linked Data technologies. Our industry partners also recognized the need for their staff to be upskilled, for which ADAPT received both industry- and exchequer funding (https://data.gov.ie/blog/apublishingfordata-gov-ieseminarsmethodsandtools-christophedebruyneanddeclanosullivanadaptcentretcd-) through our industry collaborations. I repurposed the course material I have developed for a module on Semantic Web technologies at the Vrije Universiteit Brussel. The result had to be practical and allow people to use these technologies. In this talk, I present the resulting seminars and their exercises and tutorials.

The seminars are comprised of four parts:

- S1) "Linked Data" comes in two flavors. The first is less technical and aimed at those who want to have a general understanding of the principles and examples from academia and, more importantly, from the industry. In these seminars, this version would be open to managers who would encourage their team to attend the more technical seminars. The second flavor is more technical in which we cover various technicalities (e.g., URIs, content negotiation, and HTTPRange-14), allowing attendees to make informed decisions afterward.
- S2) "Knowledge Representation on the Web" covers RDF and RDFS in depth, and touches upon OWL. The focus is on using ontologies when creating RDF rather than creating ontologies. OWL reasoning, while mentioned, is not key to this seminar. This focus was informed by the needs of research engineers, our projects, and our industry partners.
- S3) The seminar entitles "Querying RDF with SPARQL" focuses on the SPARQL Query Language, though the SPARQL Update language is mentioned. Again, this decision was informed by the need for using RDF rather than maintaining RDF in triplestores. As many datasets have a specific geospatial component, we also cover GeoSPARQL.
- S4) A fairly in-depth seminar on R2RML quickly rendered practical with the tutorial mentioned later on. Participants can avail of the Apache Jena suite to create, populate, and interrogate a triplestore with the RDF they generated.

In short, S1 is shown as the result of applying S2, S3, and S4. In terms of exercises and tutorials, they can be summarized as follows:

- For S2, we have "traditional" exercises of creating RDF using one's favorite text editor (though suggestions are provided). Participants furthermore use existing ontologies in creating their RDF. For

S3, participants query DBpedia.

- For S1 and S4, two tutorials have been developed of which parts are made available online (See [1] and [2]). The (currently) offline version of the R2RML tutorial also included a challenging exercise using the RDF Data Vocabulary and Census data. Participants can follow the Linked Data Frontend tutorial on its own, or avail of a combined tutorial in which they cover the whole creation pipeline.

The material developed for these seminars are currently used for two training networks: FAIRVASC (https://www.era-learn.eu/network-information/networks/sc1-bhc-04-2018/1st-ejp-rd-joint-transnational-call-for-rare-diseases-research-project-jtc-2019/fairvasc-building-registry-interoperability-to-inform-clinical-care) and PROTECT (https://protect-network.eu/).

Acknowledgements

References

1. Debruyne, C. (2019). R2RML: A Step-by-step Tutorial. URL: https://github.com/chrdebru/r2rml-tutorial (https://github.com/chrdebru/r2rml-tutorial)

2. Debruyne, C. (2019). Serving Linked Data: A Step-by-Step Tutorial. URL: https://github.com/chrdebru/linked-data-frontend-tutoriall (https://github.com/chrdebru/linked-data-frontend-tutorial)