

SEMANTIC WEB

GIAN (MHRD, Govt. of India) Supported Advance Level Course @ NITK Surathkal

Overview

The current World-Wide Web enables an easy, instant access to a vast amount of online information. However, the content in the Web is typically for human consumption, and is not tailored for machine processing. The Semantic Web is hence intended to establish a machine-understandable Web, and is currently also used in many other domains and not only in the Web. The World Wide Web Consortium (W3C) has developed a number of standards around this vision. Among them is the Resource Description Framework (RDF), which is used as the data model of the Semantic Web. The W3C has also defined SPARQL as RDF query language, RIF as rule language, and the ontology languages RDFS and OWL to describe schemas of RDF. The usage of common ontologies increases interoperability between heterogeneous data sets, and the proprietary ontologies with the additional abstraction layer facilitate the integration of these data sets. Therefore, we can argue that the Semantic Web is ideally designed to work in heterogeneous Big Data environments.

There are masses of Semantic Web data freely available to the public - thanks to the efforts of the linked data initiative. According to <http://stats.lod2.eu/> the current freely available Semantic Web data is approximately 90 billion triples in over 3,300 datasets, many of which are accessible via SPARQL query servers called SPARQL endpoints. Everyone can submit SPARQL queries to SPARQL endpoints via a standardized protocol, where the queries are processed on the datasets of the SPARQL endpoints and the query results are sent back in a standardized format. Hence not only Semantic Web data is freely available, but also distributed execution environments for Semantic Big Data are freely accessible. This makes the Semantic Web an ideal playground for Big Data research.

In this lecture the students first learn the basics of the Semantic Web and especially the core of the family of Semantic Web languages. Afterwards the lecturer introduces the technologies and approaches for efficient data handling, query processing and rule evaluation specialized to the Semantic Web world.

Schedule	April 11, 2016 to April 15, 2016
Course Contents	1. Introduction to and Motivation of the Semantic Web 2. Data Format RDF and Ontology Language RDF Schema 3. Query Language SPARQL 4. Rule Interchange Format (RIF) 5. Web Ontology Language (OWL) 6. Web Ontology Language (OWL) - OWL2RL inference rules in RIF 7. Query Processing Strategies for Semantic Web 8. Evaluation Strategies for Semantic Web Rules and Tableau-Approach 9. Parallelization of Semantic Web Databases 10. Processing Strategies for Semantic Web Data in the Cloud
Host Institute	NITK Surathkal, Mangalore (http://nitk.ac.in/)
Max. No.of Participants	Limited to 50
You Should Attend if...	• Engineers and professionals from industries, service and government organizations including R&D laboratories. • Student students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.
Course Registration Fee	• Participants from abroad: US \$500 • Industry/ Research Organizations: Rs. 10,000/- • Academic Institutions: Rs. 5,000/- The above fee includes all instructional materials, computer use and internet facility. The participants <u>will not be given</u> any TA/DA and boarding / lodging support. Participant can bring their laptop for effective utilization of course delivery.

Teaching Faculty



Sven Groppe is currently an Privatdozent Dr. rer. nat. habil. of Institute of Information Systems (IFIS) at University of Lübeck, Germany. His research interests are in the broad area of Semantic Web Databases. Sven Groppe currently serves or has served on the program committees of IEEE CloudCom, ICEIS, XANTEC, ICAART, DEXA, KEOD, IDEAS, . He is the Workshop Chair of Semantic Big data at SIGMOD 2016. He also serves as a reviewer for various journals including ACM Transactions on Internet Technology (TOIT), IEEE Transactions on Knowledge and Data Engineering (IEEE TKDE), IEEE Transactions on Services Computing, Journal of Systems and Software (JSS). He was the exmember of W3C working groups: Rule Interchange Format Working Group and RDF Data Access Working Group. For more information: <http://www.ifis.uni-luebeck.de/~groppe>.

Teaching Faculty

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Course Co-ordinator

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