
European PhD Program in Computational Logic

EPCL Basic Training Camp 2011: Part 2

13-15 December 2011, TU Dresden



Version of 2 December 2011

This is the program of the second part of the 2011 Basic Training Camp, which comprises the research talk and course by Alessandro Artale. The program of the first part of the 2011 EPCL Basic Training Camp in November can be found at http://www.epcl-study.eu/fileadmin/downloads/program_btc_2011.pdf. Up-to-date information about EPCL is provided at <http://www.epcl-study.eu/>.

The annual EPCL Basic Training Camp provides a set of research talks and courses in specialized topics, covering the main areas within Computational Logic. The courses are especially tailored for young researchers.

In 2011, the EPCL Basic Training camp takes place at TU Dresden. Lecturers are Alessandro Artale from Free University of Bozen-Bolzano, Italy, Pedro Barahona from Universidade Nova de Lisboa, Portugal, James Delgrande from Simon Fraser University, Canada, as well as Franz Baader, Bernhard Ganter and Steffen Hölldobler from TU Dresden, Germany.

Research Talks

Tailoring Temporal Description Logics for Reasoning over Temporal Conceptual Models

Alessandro Artale
Free University of Bozen-Bolzano, Italy
<http://www.inf.unibz.it/~artale/>

Temporal data models describe how data can evolve in the context of temporal databases. Both the Extended Entity-Relationship (EER) model and the Unified Modelling Language (UML) have been extended to be used in temporal database design. On the one hand, conceptual schemas can be encoded in Description Logics (DLs), which enables automated checking of their quality properties. On the other hand, reasoning in temporal DLs turns out to be too complex, with satisfiability problems ranging from 2ExpTime-complete to undecidable.

In this talk we propose to temporalize the 'light-weight' DL-Lite logics obtaining nice computational results while still being able to represent various types of constraints in temporal conceptual models.

Lectures

Lecture 1 – DL-Lite: A First-Order-Logic Account

Lecture 2 – DL-Lite for Conceptual Modelling

Alessandro Artale
Free University of Bozen-Bolzano, Italy
<http://www.inf.unibz.it/~artale/>

The recently introduced series of description logics under the common moniker DL-Lite has attracted attention of the description logic and semantic web communities due to the low computational complexity of inference, on the one hand, and the ability to represent conceptual modeling formalisms, on the other. The main aim of this series of lectures is to present various extensions of DL-Lite logics along different axes: by (i) adding the Boolean connectives and (ii) number restrictions to concept constructs, (iii) allowing attributes to associate concrete values to objects. The main technique is based on embedding DL-Lite logics in suitable fragments of the one-variable first-order logic, which provides useful insights into their properties and, in particular, computational behavior.

In the Lecture 1, we analyze the combined complexity of satisfiability for the resulting logics, as well as the data complexity of answering positive existential queries. Many results will be obtained starting from the FOL embeddings.

In the Lecture 2, we show how variants of DL-Lite can be put into correspondence with formalisms used for conceptual modeling in various contexts (e.g., the Entity-Relationship Model and UML Class Diagrams). The possibility to rely on such a conceptual layer is of importance in several application contexts that rely on huge amounts of data with complex interrelationships, e.g., in Data Integration, Data Exchange, the Semantic Web, Ontology-Based Data Access. In these contexts, the fundamental inference task is querying the data with expressive database inspired query languages, while fully taking into account the semantics of the ontology.

Location

The Basic Training Camp takes place in of the building of the *Fakultät Informatik* of TU Dresden, Nöthnitzer Straße 46, 01187 Dresden.

The research talk on Tuesday is in

Room E005

The lectures on Wednesday and Thursday take place in

Room 2026

The site is close to the tramway stop *Münchner Platz* (Tramway 3) and bus stop *Helmholtzstraße* (Bus 85). Its Google Maps link is: <http://maps.google.de/maps?q=noethnitzer+str+46+google+map&hl=de&ie=UTF8&hnear=N%C3%B6thnitzer+Stra%C3%9Fe+46,+Plauen+01187+Dresden,+Sachsen&gl=de&t=m&z=16&vpsrc=0>

Tuesday, 13 December

13.15 – 14.45 RESEARCH TALK: Alessandro Artale
Tailoring Temporal Description Logics for Reasoning over Temporal Conceptual Models
Room E005

14.45 – 15.10 COFFEE AND TEA

Wednesday, 14 December

11.10 – 12.40 LECTURE: Alessandro Artale
DL-Lite: A First-Order-Logic Account
Room 2026

Thursday, 15 December

11.10 – 12.40 LECTURE: Alessandro Artale
DL-Lite for Conceptual Modelling
Room 2026
