

## Semantic web: from XML to OWL

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# Semantic Web: from XML to OWL

## Development of the future web

- Expressing information → Languages
- Manipulating it → Algorithms
- in the most **correct**, **efficient**  
and **meaningful** way → Logic  
→ Semantics

## Outline

1. **Foundations for Processing XML Trees (15h), Dr. Pierre Genevès (CNRS)**
2. Social Web (6h), Dr. Sihem Amer-Yahia (CNRS)
3. Semantic Web (15h), Dr. Manuel Atencia (UGA)

# Organization: Important URLs

This course website: <http://moex.inria.fr/teaching/sw/>

- Papers, slides, specific information (room, changes...)
- Slides for the first part: <http://pierre.geneves.net/teaching.html>
- Right now: circulating sheet with Name, Email, research team/supervisor with whom your internship is planned, desired topics for internship (if any)

## Project proposals

- It is time to hunt for an internship (website: <http://im2ag-pcarre.e.ujf-grenoble.fr/>)
  - Do not hesitate to look around on your own.
- Project must be defended in June 2018 to qualify for PhD scholarships on academic merit

The MSTII Doctoral School: <http://edmstii.ujf-grenoble.fr/>

- Organizes the PhD program of the university Grenoble-Alpes (UGA)
- Mathematics, Information Sciences & Technologies, Computer Science

# Foundations for Processing XML Trees

You will learn about foundations for tree-shaped data processing

- Tree structured data
  - Tree languages, tree grammars, tree automata
- Efficient processing with trees
  - Programming with structured information streams, scalable validation, query processing
- Analysing programs that process trees
  - Algorithms for the static analysis of queries (ex: checking for query equivalence), and of programs that process trees
- Foundational theory & tools
  - *Regular tree expressions*
  - *Finite tree automata*
  - *Tree logics*

# Outline

Foundations... illustrated with XML technologies

## Part 1: Technologies

- Essential XML technologies: Core XML, Schema Languages, Parsing
- Streaming Validation (with SAX and DTD)
- Queries and transformations (XPath, XQuery)

## Part 2: Fundamentals

- Foundations of XML Types (Tree Grammars, Finite Tree Automata)
- Tree Logics (First-Order Logic, Monadic Second-Order Logic)
- Tree Logics continued ( $\mu$ -calculus)

## Part 3: Recent Research

- Query Analysis
- Static Type Checking for XQuery and NoSQL languages
- Grand Challenges and Current Research