Semantic Web Applications and Tools for Life Sciences (SWAT4LS)

Semantic Web technologies, tools and applications are starting to emerge in Life Sciences. In recent years, systems have been introduced and an increasing interest among researchers is arising. The 2008 *Semantic Web Applications and Tools for Life Sciences (SWAT4LS)* workshop, which was held at the e-Science Institute, Edinburgh, Scotland, UK on November 28th, 2008, provided a venue to present and discuss benefits and limits of the adoption of these Semantic Web technologies and tools in biomedical informatics and computational biology. The aim of the workshop was both to present new and interesting research results and to show successful tools and applications. It brought together researchers, both developers and users, from the various fields of Biology, Bioinformatics and Computer Science, who discussed goals, current limits and real use cases for Semantic Web technologies in Life Sciences.

The SWAT4LS workshop's objectives were:

- To present and discuss benefits and limits of the adoption of Semantic Web technologies and tools in biomedical informatics and computational biology.
- To showcase experiences, information resources, tools development and applications.
- To bring together researchers, both developers and users, from the various fields of Biology, Bioinformatics and Computer Science.
- To discuss goals, current limits and some real use cases for Semantic Web technologies in Life Sciences

The SWAT4LS workshop was a new kind of event to help cross-fertilize between the Life Sciences community and the Informatics-oriented Semantic Web community. It made clear that there is a successful path from high-quality research results in both fields to applied integrated applications. The technical program shows a carefully selected presentation of current research and development in 40 submissions:

- full papers: 24 submitted, 8 accepted for publication;
- poster papers: 15 submitted, 4 accepted for publication;
- demo papers: 1 submitted, 1 accepted for publication;

The Call for Participation resulted in 76 attendees, a considerable success, particularly considering that the event had been organised for the first time and as a stand-alone workshop not co-located with any other Bioinformatics or Semantic Web conference. The symposium brought

together Informatics experts and scientists from the Life Sciences, which indeed was one of the key objectives of the workshop.

The real success of the Semantic Web technology in Life Sciences will be measured by the applications that use the technology rather than the technology itself. Many participants were actively involved in practical discussions on implementation details, including tools that demonstrated to give most effective outcomes, special limits of existing tools and first interesting biological results.

The panel discussion was a good opportunity to discuss current limits and perspectives of the adoption of Semantic Web technologies in Life Sciences, showing that we are quickly moving from a pioneering era, where the real applicability of these technologies were investigated, to a more effective and productive time, where the first tools are being implemented, starting to demonstrate the actual benefits of this approach.

The SWAT4LS organizers wish to thank the excellent program committee for their hard work in reviewing the submitted papers. Their criticism and very useful comments and suggestions were instrumental to achieve a high quality of publication. We also thank the workshop authors for submitting good papers, responding to the reviewers' comments, and abiding by our production schedule. We further wish to thank the keynote speakers to contribute their interesting talks. We are very grateful to the e-Science Institute Edinburgh for enabling this fruitful workshop.

Finally, we thank our sponsors, whose financial support helped us to offer this event, and whose technical support allowed to attract many high-quality submissions. The SWAT4LS workshop was financially and technically supported by OMII-UK and LabAge, Leaf Bioscience, and Textensor.

January 2009

Albert Burger, Adrian Paschke, Paolo Romano, Andrea Splendiani
(Co-chairs of SWAT4LS)

SWAT4LS Program Committee

- Giuliano Armano, DIEE, University of Cagliari, Italy
- Christopher Baker, Knowledge Discovery Department, Institute for Infocomm Research (I2R), Singapore
- Pedro Barahona, Department of Informatics, New University of Lisboa, Lisboa, Portugal
- Liliana Barrio-Alvers, Transinsight GmbH, Dresden, Germany
- Virendrakumar (Virendra) C. Bhavsar, Advanced Computational Research Laboratory, University of New Brunswick, Fredericton, Canada
- Olivier Bodenreider, National Library of Medicine, Bethesda, MD, United States of America
- Matt-Mouley Bouamrane, School of Computer Science, University of Machester, manchester, United Kingdom
- Werner Ceusters, NY CoE in Bioinformatics and Life Sciences, University at Buffalo, Buffalo, NY, United States of America
- Kei Cheung, Yale Center for Medical Informatics, Yale, New Haven, United States of America
- Marie-Dominique Devignes, LORIA, Vandoeuvre les Nancy, France
- Michel Dumontier, Carleton University, Ottawa, Ontario, Canada
- C. Maria Keet, Faculty of Computer Science, Free University of Bozen-Bolzano, Bolzano, Italy
- Graham Kemp, Chalmers University of Technology, Sweden
- Jacob Tilman Koehler, Department of Molecular Biotechnology, Institute of Medical Biology, University of Tromsø, Tromsø, Norway
- Ludwig Krippahl, Department of Informatics, New University of Lisboa, Lisboa, Portugal
- Patrick Lambrix, Department of Computer and Information Science, Linköping University, Linköping, Sweden
- Phillip Lord, School of Computing Science, University of Newcastle, Newcastle, United Kingdom
- Joanne Luciano, MITRE Corporation, Bedford, United States of America
- Olivo Miotto, Nuffield Department of Clinical Medicine, University of Oxford, United Kingdom
- M. Scott Marshall, University of Amsterdam, The Netherlands

- Lyndon Nixon, STI International, Austria
- Stephan Philippi, Institute for Software Technology, University of Koblenz-Landau, Koblenz, Germany
- Alan Ruttenberg, Science Commons, Cambridge, MA, USA
- Matthias Samwald, DERI, Galway, Ireland, and Semantic Web Company, Wien, Austria
- Nigam Shah, Center for Biomedical Informatics Research, Stanford, USA
- Michael Schröder, Biotechnology Centre, TU Dresden, Dresden, Germany
- Robert Stevens, School of Computer Science, University of Manchester, Manchester, United Kingdom
- Luca Toldo, Merck Serono, Darmstadt, Germany
- Tetsuro Toyoda, Genomic Sciences Center, RIKEN, Yokohama, Japan
- Jano van Hemert, National e-Science Centre, University of Edinburgh, Edinburgh, United Kingdom