

# Andriy Nikolov

## [Knowledge Media Institute](#)

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## Research interests

My main research interests are in the semantic data management domain, in particular:

- *Semantic data integration*. This is a complex problem which arises when combining semantic data from different repositories and involves several more specific problems such as instance coreference resolution, inconsistency resolution, and ontology matching.
- *Linked Data*. Linked Data rules for publishing semantic data online already allowed making many important data repositories available on the Web. Growing amount of publicly available semantic information opens many opportunities for reuse and integration of data as well as introduces several important research challenges, such as discovering relevant data repositories and identifying overlaps in data sources.
- *Knowledge representation*. My work in the SmartProducts project includes building ontologies modelling information needed to interact with the user in an intelligent way: in particular, context data (including sensor data), user profile, product capabilities, etc.
- *Data mining*. Data mining algorithms provide a powerful tool for solving various problems arising in semantic data integration. Semantic data repositories published within the Linked Data initiative provide large volumes of semantic data, which can serve for training machine learning algorithms.

## Professional Experience

### Research Associate

May 2009 – Present

*Knowledge Media Institute, The Open University, Milton Keynes, UK*

- Researcher in the [SmartProducts](#) EU project (2009-present). The project addresses research issues related to the development of consumer product enhanced with intelligent capabilities. In this project I am the **work package leader of WP2 “Semantic modeling and management of proactive knowledge”** which deals with **development of ontological knowledge models** supporting context-, user-, and task-awareness of smart products.
- As part of this work, I participated in **development of the [W3C Semantic Sensor Network ontology](#)**.
- Participant in the [LUCERO](#) JISC project, which deals with publishing various university-related data repositories using Linked Data principles. My role in this project involves interlinking published repositories with external publicly available sources, in particular, **discovery of relevant data sources on the Web and generation of links between resources**.

### Research Assistant

October 2005 – April 2009

*Knowledge Media Institute, The Open University, Milton Keynes, UK*

- Researcher in the [X-Media](#) EU project (2006-2010). The project focused on combining information extraction and Semantic Web technologies to facilitate corporate knowledge management.

- While working on my PhD dissertation titled “*Fusing automatically extracted annotations for the Semantic Web*”, my main contributions were **design and implementation of knowledge fusion algorithms for integration of semantic data from different sources**.
- As part of this work, I **designed and implemented the [KnoFuss](#) semantic data fusion system** which tackles the problems of coreferencing and inconsistency resolution occurring when merging semantic repositories structured using OWL ontologies.
- Participated in the **development of the [PowerAqua](#) semantic question answering system** which allows querying semantic data distributed in different repositories using natural language queries. My contribution primarily involves developing algorithms for merging and ranking of retrieved search results.

#### **Software developer**

October 2004 – September 2005

*Self-employed, Sverdlovsk, Ukraine*

- Developed the EMailAnalyzer experimental tool for mining workflow patterns from e-mail logs. The tool was implemented as a plugin for the [ProM](#) process mining system.
- Participated in the development of the Nemo Database (database covering statistical data on fishing vessels, plants, and sea farming).

#### **Software developer (intern)**

September 2002 – August 2004

*SalesManager Software BV, Amsterdam, Netherlands*

- Developed modules for the SalesManager CRM system.

### **Education**

#### **PhD in Computer Science**

October 2005 – September 2009

*Knowledge Media Institute, The Open University, Milton Keynes, UK*

- Thesis title: “Fusing automatically extracted annotations for the Semantic Web”.

#### **MSc in Artificial Intelligence**

September 2002 – September 2004

*Vrije Universiteit, Amsterdam*

#### **Engineer in Computer Science**

July 2002 – June 2003

*Kharkov National University of Radioelectronics (diploma with distinction)*

#### **Bachelor in Computer Science**

September 1998 – June 2002

*Kharkov National University of Radioelectronics (diploma with distinction)*

### **Publications**

- 2011
- A. Nikolov, M. d’Aquin, E. Motta (2011) What Should I Link To? Identifying Relevant Sources and Classes for Data Linking. Joint International Semantic Technology Conference (JIST 2011) (accepted)
  - A. Ferrara, A. Nikolov, F. Scharffe (2011) Data Linking for The Semantic Web, International Journal of Semantic Web and Information Systems (accepted)
  - M. d’Aquin, A. Nikolov, E. Motta (2011) Building SPARQL-Enabled Applications with Android Devices, Demo at 10th International Semantic Web Conference (ISWC 2011), Bonn, Germany
  - M. d’Aquin, A. Nikolov, E. Motta (2011) Enabling Lightweight Semantic Sensor Networks on Android Devices, Workshop: 4th International Workshop on Semantic Sensor Networks 2011 (SSN11) at 10th International Semantic Web Conference (ISWC 2011), Bonn, Germany
  - L. Lefort, C. Henson, K. Taylor, P. Barnaghi, M. Compton, O. Corcho, R. Garcia-Castro, J. Graybeal, A. Herzog, K. Janowicz, H. Neuhaus, A. Nikolov, K. Page (2011) W3C Semantic Sensor Network XG Final Report, W3C Incubator Group Report

- A. Nikolov, M. d'Aquin (2011) Identifying Relevant Sources for Data Linking using a Semantic Web Index, Workshop: 4th Workshop on Linked Data on the Web (LDOW 2011) at 20th International World Wide Web Conference (WWW 2011), Hyderabad, India
- 2010
- A. Nikolov, E. Motta (2010). Capturing emerging relations between schema ontologies on the Web of Data. 9th International Semantic Web Conference (ISWC 2010), Workshop on Consuming Linked Data (COLD 2010). Shanghai, China.
  - A. Nikolov, N. Li, M. d'Aquin, E. Motta (2010). Evaluating semantic data infrastructure components for small devices. 9th International Semantic Web Conference (ISWC 2010), Workshop on Evaluation of Semantic Technologies (IWEST 2010). Shanghai, China.
  - V. Lopez, A. Nikolov, M. Sabou, V. Uren, E. Motta (2010). Scaling up question-answering to Linked Data. 17th International Conference on Knowledge Engineering and Knowledge Management (EKAW 2010). Lisbon, Portugal.
  - M. d'Aquin, A. Nikolov, E. Motta (2010). How much semantic data on small devices? 17th International Conference on Knowledge Engineering and Knowledge Management (EKAW 2010). Lisbon, Portugal.
  - A. Nikolov (2010). Fusing automatically extracted annotations for the Semantic Web. PhD Thesis. Knowledge Media Institute, The Open University.
  - A. Nikolov, V. Uren, E. Motta (2010). Data linking: capturing and utilising implicit schema-level relations. Workshop: Linked Data on the Web, WWW 2010, Raleigh, NC, USA.
- 2009
- V. Lopez, A. Nikolov, M. Fernandez, M. Sabou, V. Uren, and E. Motta (2009). Merging and Ranking Answers in the Semantic Web: The Wisdom of Crowds. 4th Asian Semantic Web Conference (ASWC 2009), Shanghai, China. **(best paper award)**
  - A. Nikolov, V. Uren, E. Motta, A. de Roeck (2009). Overcoming schema heterogeneity between linked semantic repositories to improve coreference resolution. 4th Asian Semantic Web Conference (ASWC 2009), Shanghai, China.
  - M. Sabou, J. Kantorovitch, A. Nikolov, A. Tokmakoff, X. Zhou, and E. Motta (2009). Position Paper on Realizing Smart Products: Challenges for Semantic Web Technologies. Workshop: The 2nd International Workshop on Semantic Sensor Networks, 8th International Semantic Web Conference (ISWC 2009), Washington, USA.
  - A. Nikolov, V. Uren, E. Motta, A. de Roeck (2009). Overcoming schema heterogeneity for data-level integration. Poster session, ESWC 2009, Heraklion, Greece.
  - A. Nikolov, V. Uren, E. Motta, A. de Roeck (2009). Towards data fusion in a multi-ontology environment. Workshop: Linked Data on the Web, WWW 2009, Madrid, Spain.
- 2008
- A. Nikolov, V. Uren, E. Motta, A. de Roeck (2008). Refining instance coreferencing results using belief propagation. 3rd Asian Semantic Web Conference (ASWC 2008).
  - A. Nikolov, V. Uren, E. Motta, A. de Roeck (2008). Integration of semantically annotated data by the KnoFuss architecture. 16th International Conference on Knowledge Engineering and Knowledge Management (EKAW 2008).
  - A. Nikolov, V. Uren, E. Motta, A. de Roeck (2008). Handling instance coreferencing in the KnoFuss architecture. Workshop: Identity and Reference on the Semantic Web, ESWC 2008, Tenerife, Spain.
  - W. M. P. van der Aalst, A. Nikolov (2008). Mining e-mail messages: uncovering interaction patterns and processes using e-mail logs. International Journal of Intelligent Information Technologies 4(3).
  - A. Nikolov, V. Uren, E. Motta, A. de Roeck (2008). Using the Dempster-Shafer theory of evidence to resolve ABox inconsistencies. In: Uncertainty Reasoning for the Semantic Web I, Eds: P. C.G. da Costa, C. d'Amato, N. Fanizzi, K. B. Laskey, K. Laskey, T. Lukasiewicz, M. Nickles, M. Pool.
- 2007
- A. Nikolov, V. Uren, E. Motta, A. de Roeck (2007). Using the Dempster-Shafer theory of evidence to resolve ABox inconsistencies. Workshop: Uncertainty Reasoning for the Semantic Web, ISWC 2007, Busan, Korea.

- A. Nikolov, V. Uren, E. Motta, A. de Roeck (2007). KnoFuss: A comprehensive architecture for knowledge fusion. Poster. K-CAP 2007, Whistler, Canada.
- 2006
- A. Nikolov (2006). Fusing automatically extracted semantic annotations. KnowledgeWeb PhD Symposium 2006 (KWEPSY 2006), ESWC 2006, Budva, Montenegro.
  - A. Nikolov, V. Uren, E. Motta, A. de Roeck (2006). Measuring similarity for fusing extracted knowledge. 9th Annual CLUK Research Colloquium, Milton Keynes, UK.

### Academic involvement

- Reviewer: [International Journal of Semantic Web and Information Systems](#), [Journal of Computer and System Sciences](#), [IEEE Transactions on Systems, Man, and Cybernetics](#), [Journal of Web Semantics](#).
- PC member: [ESWC 2012](#), [OM 2011](#), [SSN11](#), [ESWC 2011](#), [SSN10](#), [EKAW 2010](#).
- Co-organizer: [EKAW 2012](#), [OAEI 2011](#), [OAEI 2010](#), [OAEI 2009](#).
- Member: [W3C Semantic Sensor Networks XG](#)

### Technical skills

#### Primary:

- Programming languages: Java
- Semantic Web standards: RDF, RDFS, OWL, SPARQL
- Ontology engineering tools: Protégé, NeON toolkit
- Web development technologies: JSP, Java Servlets, JBoss, Apache Tomcat
- Database management systems: MySQL
- Semantic Web tools and APIs: Sesame, Jena, OWL-API, OWLIM, Pellet, BaseVISor
- Data mining tools: Weka

#### Secondary:

- Programming languages: C++, Python, Delphi
- Database management systems: PostgreSQL, MS SQL Server
- Web service standards: WSDL, SOAP
- Rule engines: Jess

### Language skills

#### Fluent:

- English
- Russian (native)
- Ukrainian

#### Limited knowledge:

- Chinese (1 year part-time course)
- German (1 year part-time course)
- Dutch (lived in Amsterdam for 2 years)

### Recommendations

Available upon request