

# Slavko Žitnik

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## Employment

- 2014–present | **University of Ljubljana, Faculty for computer and information science**  
Research/Teaching Faculty  
I am a faculty member of the [Laboratory for Data Technologies](#) and I am mainly researching in the fields of text information extraction and retrieval. I am also teaching courses of natural language processing, web information extraction and retrieval, database design and management and information systems and modeling. I also work on projects in the fields of Internet of Things (*EkoSMART*), information extraction (*Ministry of Public Administration*) and text search in databases (*Iskratel*). Internationally I actively cooperate with the [Université Paris 1, Sorbonne](#), the [School of Electrical Engineering, University of Belgrade](#) and the [College of Education, University of South Florida](#)
- 2014–2014 | **Microsoft Development Center Norway, Oslo**  
Software Development Engineer in Test Intern  
The research and development center [MDCN](#) in Oslo focuses on information retrieval technologies within the enterprises. Their services are used by Microsoft's products such as Office, Sharepoint, Exchange and others. As an intern I participated in the feeding team, which goal is to extract appropriate data from a document and feed the index with it. My task was to enable the embedded documents parsing, calculate expected index growth, monitor the three-phase deployment process across all the farms in the world and provide reports that show the correct behaviour of the feature. With a group of four buddies we attended the internal Microsoft hackathon, where we proposed an algorithm and implemented a prototype that enables the expert search in Microsoft Delve. My role was to design an algorithm for expertise extraction and experts ranking. The local management liked the idea of our approach, so we also presented it in Redmond, where they decided to apply it for a patent.
- 2011–2014 | **Optilab d.o.o. & University of Ljubljana**  
Junior Researcher from Industry  
[Optilab](#) is a company, which focuses mainly on fraud management systems - [Admiral](#). As a Junior Researcher I try to merge data from arbitrary data sources and extract structured data from textual sources, which can help in anomaly detection. I am also trying to transfer research results into usable prototypes or end products. Furthermore, I am responsible for [science and tech talks](#) organization at Optilab. My research is conducted at the [Faculty of Computer and Information Science](#), in [Laboratory for Data Technologies](#), under supervision of [Prof. Dr. Marko Bajec](#). My field of research is focused on information extraction (i.e., entity extraction, relation extraction and coreference resolution) from textual data, for which most of my research-based source code is [publicly available](#).

## Education

- 2010–2014 | **PhD** University of Ljubljana, Faculty of Computer and Information Science, *Ljubljana*, (*GPA of 9.0 on scale 1-10*), Operation financed by Slovene Ministry of Economic Development and Technology and European Social Fund.
- 2006–2010 | **BSc** University of Ljubljana, Faculty of Computer and Information Science and Faculty of Mathematics and Physics, *Ljubljana*, (*GPA of 9.0 on scale 1-10*), Interdisciplinary University Program of Computer Science and Mathematics
- 2002–2006 | Upper Secondary School of Electrical and Computer Engineering, Vegova, *Ljubljana*, *summa cum laude*, Technical Gymnasium

## Language skills

Slovene	Native speaker (Mother tongue)
English	Fluent (C2 - Proficient user)
German, Croatian, Serbian	Intermediate (B1 - Independent user)

## Honors, awards & fellowships

2018	Award for contributions in development and reputation from the Slovenian Society INFORMATIKA.
2013	First place in relationship extraction between proteins and genes from biomedical texts for gene regulatory networks construction at the BioNLP 2013 challenge.
2013	Seventh place in drugs and chemical compounds recognition from biomedical texts at the CHEMDNER challenge.
2010	Gold medal as a Cisco specialist at the EuroSkills 2010 competition.
2010	First place as an IT team at the SloSkills 2010 competition.
2010	Faculty award for best students.
2009	Bronze medal at the Imagine Cup Competition.
2007	Faculty award for best students.
2002–2010	Zois fellowship.

## Invited teaching

2015–2015	In July 2015 prof. dr. Marko Bajec and I led the Summer School course of Database design and modeling at the Kyungpook National University in Daegu, South Korea.
2009–2016	CCNA courses instructor at the Cisco Networking Academy. Lecturing, conducting exercises and marking for CCNA 1–4 classes.
2010–2016	Teaching assistant for computer networking classes at Vocational College Kranj. Conducting exercises and helping students at practical work on Cisco network appliances.
2008–2010	Teaching assistant for programming classes at the Faculty of Computer and Information Science (Java, C and Python). Helping and mentoring undergraduate students at programming exercises.

## Professional activities

2016–present	<b>Agency for communication networks and services of the Republic of Slovenia</b> Member of the supervisory board As a member of the supervisory board I am responsible for the supervision of operations at the Agency as defined by the Slovene legislation act ZEKom-1, articles 174 to 180. <a href="#">□</a>
2016–present	<b>Electronic Communications Council of the Republic of Slovenia</b> Chairman of the Council The Council is a body to advise on the development of electronic communications and the protection of consumers' interests in the field of electronic communications in the Republic of Slovenia. The council prepares opinions, recommendations, proposals according to the Slovene legislation act ZEKom-1, articles 229 to 231. <a href="#">□</a>

## Skills history & challenges

2014	<b>Krimar.si and Mikro Graf Art d.o.o.</b> Independend design and implementation of the new application Sociogram 5.0. The new version supports end-to-end sociometric analysis for schools, teams and industry. Due to existing customers excitements about Sociogram v4.01 we added new functionalities and also supported additional languages.
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- 2014 **SloSkills 2014**, ICT competition  
Technical leader, Judge.
- 2013 **Lajkbuk.si**  
Idea and development of a [Facebook like platform](#) using Spring (MVC, Social, Security) Framework and Hibernate. The platform enables the automatic arrangement of Facebook prize competitions for companies that would like to get more likes for their Facebook pages.
- 2013 **Institute of Clinical Neurophysiology**, Ljubljana  
Development of a register of extrapyramidal diseases in Spring (WebFlow, Security) Framework, JSF 2.0 and Hibernate.
- 2012 **WorldSkills Europe 2012**, Spa-Franchorchamps  
Slovenian Team Leader.
- 2012 **SloSkills 2012**, Ljubljana  
Cisco specialist judge and supervisor to a winning ICT Team.
- 2011 **Vegova Skills 2011**  
High school competition organizer.
- 2010 **EuroSkills 2010 Competition**, Lisbon  
*Gold medal as Cisco specialist* (also the [name of week](#) on Slovenian national radio station), Silver medal as a team, Gold medal as the best Slovenian competitor.
- 2010 **Nokia App Forum Competition**  
Development of mobile application [MobiFoto](#) in Symbian Qt and backend application with web services in PHP.
- 2010 **Si.Mobil Android Competition**  
Development of a [MobiFoto prototype](#) on Android 2.0.
- 2010 **SloSkills Competition**  
*First place as an Office ICT Team* with my role as Cisco specialist.
- 2010 **ACM High school Competition**  
Co-organization and development of a custom module for Moodle - coloring input source code, automatic PDF report generation.
- 2010 **Abito d.o.o.**  
Co-authoring Computer networks e-learning materials for Slovenian Vocational Colleges, Sharepoint Server administration.
- 2009 **Mikro Graf Art d.o.o.**  
Fully independent design and development of [Sociogram v4.01](#). Java-based software with automatic licensing, which is *currently used by more than 50 Slovenian primary schools*.
- 2009 **Imagine Cup Competition**  
*Team leader, Bronze medal* for design and development of information system, project I See You Know. Project [I See You Know](#) is natural disaster information system, aiming at fast and quality coordination between civil service and dispatching information to public, written in ASP.NET C# and Windows Mobile.
- 2008 **Mikro Graf Art d.o.o.**  
Fully independent design and development of [CrossManager 1.0](#) - a sports timing software, written in C# and WPF, that supports competitors import, barcode scanning at finish line and automatic report and diploma generation. The software is still used to organize cross competitions in Ljubljana primary schools.
- 2008–2009 **Avtenta.si**  
Integration of call log data streams between three different call center systems. Development of a meeting minutes application on Sharepoint 2007 server for Telekom Slovenije d.d.. Development of internal phonebook and reports application in ASP.NET and Cisco Call Manager (CDR) for brokerage house Argonos.
- 2008 **Marg d.o.o.**  
Second place at a student competition. Design and development of a social network [M:ravljisce](#) (eng. Anthill) in Mobitel's (Slovenian national mobile operator) proprietary platform Pla.NET.
- 2007 **Hermes Softlab d.o.o.**, Vendors department  
Development of a Timecard application for The SEZ Group in Java SE and Jasper Reports. Development of a wafer control server for The SEZ Group in C++.
- 2007 **Hermes Softlab d.o.o.**  
Summer school participant, development of a web application in Java EE, Hibernate and ZKOSS UI framework.

## Associations

- 2012–2015 **Doctoral consortium of the University of Ljubljana**  
As a representative of the doctoral students at the University of Ljubljana I cooperated in decision making regarding the doctoral curriculum changes. Additionally, the main role of the consortium is to approve PhD thesis proposals. Because of that I learned a lot about the definition of a scientific excellence for specific research areas.
- 2012–2015 **Association of Doctoral Candidates in Slovenia**  
As a board member of [the association](#) I co-organized [a two-day conference](#) regarding the employment possibilities of PhD students in industry after they graduate. I was a chairman of comitee for selection of the best PhD supervisor of year 2013 in Slovenia. I also reorganized the IT infrastructure of the association.

## Service to the profession

- Reviewing | Computational Linguistics.  
PLoS One.  
Journal of Cheminformatics.  
Journal of Web Semantics.  
Journal of Computer Science and Technology.  
International Journal of Information System Modeling and Design.  
IEEE RCIS – International Conference on Research Challenges in Information Science.  
CAiSE – International Conference on Advanced Information Systems Engineering.  
ADBIS – East-European Conference on Advances in Databases and Information Systems.  
KMO – Knowledge Management Conference.  
BIR – International Conference on Perspectives in Business Informatics Research
- Conferences | DSI 2015, *Co-organizer and student section chair.* [□](#)  
DSI 2016, *Co-organizer, welcome roundtable chair, IoT section chair, student section chair.* [□](#)  
CAiSE 2016, *Co-organizer.* [□](#)  
DSI 2017, *Co-organizer and student section chair.* [□](#)  
IJU 2017, *Organizer of IoT round table.*  
RCIS 2018, *Demo and poster session chair.* [□](#)  
DSI 2018, *Co-organizer and student section chair.* [□](#)
- Editor | Uporabna informatika, *Technical editor (2018–present).* [□](#)

## Publications & Patents

### Patents & Applications

Platakis, M.; Makris, C.; Tonnesen Lied, T.; Herstad, B.; Thomaidou, S.; Žitnik, S. (2016). Identifying experts and areas of expertise in an organization, in *United States Patent Application*, Microsoft, Redmond, US 14/695,822. [□](#)

Šubelj L., Žitnik S., Lavbič D., Kumer A., and Bajec M. (2013). Combining heterogeneous data sources of data processing devices, in *Slovenian Institute of Intellectual Property*, Ljubljana, Slovenia, P-201300263, pp. 1-7. [□](#)

### Books

Žitnik S. and Bajec M. (2013). Text Mining in Medicine, Chapter in *Computational Medicine in Data Mining and Modeling*, New York: Springer, pp. 105-134. [□](#)

### Peer Reviewed Journals

Žitnik S. and Bajec M. (2018). Odkrivanje koreferenčnosti v slovenskem jeziku na označenih besedilih iz coref149, in *Slovenščina 2.0: empirične, aplikativne in interdisciplinarne raziskave*, pp. 36-66. [□](#)

Žitnik S., Žitnik M., Zupan B. and Bajec M. (2015). Sieve-Based Relation Extraction of Gene Regulatory Networks from Biological Literature, in *BMC Bioinformatics*, pp. 1-16. [□](#)

Krallinger M., Žitnik S., Bajec M., et al. (2015). The CHEMDNER corpus of chemicals and drugs and its annotation

principles, in *Journal of Cheminformatics*, 7, suppl. 1, pp. 1-17. □

Fiala, D.; Šubelj, L.; Žitnik, S.; Bajec, M. (2015). Do PageRank-based author rankings outperform simple citation counts?, in *Journal of informetrics*, vol. 9, num. 2, pp. 334-348. □

Žitnik S., Šubelj L. and Bajec M. (2014). SkipCor: Skip-Mention Coreference Resolution using Linear-Chain Conditional Random Fields, in *PLoS One*, 9(6), pp. 1-14. □

Šubelj L., Žitnik S., et al. (2013). Node mixing and group structure of complex software networks, in *Advances in Complex Systems*, 17, 1450022, pp. 1-26. □

Jankovič M., Žitnik S., et al. (2013). Improvement of software development method with minimal involvement of developers, in *Uporabna Informatika*, 22(1), pp. 1-12. □

Šubelj L., Žitnik S., et al. (2013). Large real-world networks, in *Uporabna Informatika*, vol. 21, num. 2, pp. 107-119. □

Žitnik S., et al. (2013). General Context-Aware Data Matching and Merging Framework, in *Informatika*, vol. 24, num. 1, pp. 119-152. □

Zrnec A., et al. (2012). Podatkovne baze NOSQL, in *Uporabna informatika*, vol. 20, num. 3, pp. 164-172. □

### Peer Reviewed Conferences

Blagus N. and Žitnik S. (2018). Social media comparison and analysis : the best data source for research?, in *RCIS 2018: conference proceedings*, France, Nantes, 29.-31. May 2018, pp. 1-10.

Blagus N., Žitnik S. and Bajec M. (2018). Družbeni mediji kot vir podatkov za raziskave, in *Digitalizacija in mi: zbornik konference Dnevi slovenske informatike*, Slovenija, Portorož, 17.-18. April 2018, pp. 1-12.

Jankovič, M.; Žitnik, S.; Bajec, M. (2017). Arhitektura sistema za oddaljeno spremljanje pacientov, in *Workshop Electronic and mobile health and smart cities : proceedings of the 20th International Multiconference Information Society*, Slovenia, Ljubljana, 9.-13. October 2017, pp. 27-28. □

Žitnik, S.; Drašković, D.; Nikolić B.; Bajec M. (2017). nutIE - a modern open source natural language processing toolkit, in *Proceedings of papers, 25th Telecommunications Forum (TELFOR)*, Belgrade, Serbia, 21.-22. November 2017, pp. 1-4. □

Žitnik, S.; Bajec, M.; Lavbič, D. (2017) LogMap+ : relational data enrichment and linked data resources matching, in *RCIS 2017 : conference proceedings*, United Kingdom, Brighton, 10.-12. May 2017, pp. 267-275. □

Žitnik, S.; Jankovič, M.; Petrovič, K.; Bajec, M. (2016). Architecture of standard-based, interoperable and extensible IoT platform, in *Proceedings of papers of 24th Telecommunications Forum (TELFOR)*, Belgrade, Serbia, 22.-23. November 2016, pp. 1-4. □

Drašković, D.; Gencel, V.; Žitnik, S.; Bajec, M.; Nikolić, B. (2016). A software agent for social networks using natural language processing techniques, in *Proceedings of papers of 24th Telecommunications Forum (TELFOR)*, Belgrade, Serbia, 22.-23. November 2016, pp. 1-4. □

Jankovič, M.; Žitnik, S.; Bajec, M. (2016). MyDataHub, in *Workshop Electronic and Mobile Health: Proceedings of the 19th International Multiconference Information Society*, Ljubljana, Slovenia, 10.-11. October 2016, pp. 50-51. □

Žitnik S., Bajec M. (2015). Iterative joint extraction of entities, relationships and coreferences from text sources, in *Proceedings of the RCIS 2015*, Athens, Greece, 12.-15. May 2015, pp. 1-11. □

Furlan B., Žitnik S., Nikolić B. and Bajec M. (2013). The Role of Semantic Similarity for Intelligent Question Routing, in *Proceedings of the International Scientific Conference on Informatics 2013*, Spišská Nová Ves, Slovakia, 5.-7. November 2013, pp. 1-6. □

Žitnik S. and Bajec M. (2013). Token- and constituent-based linear chain CRF with SVM for named entity recognition, in *Proceedings of the Fourth BioCreative Challenge Evaluation Workshop*, Washington DC, USA, 8 October 2013, vol. 2, pp. 144-151. □ **Achieved rank 7 among 27 participating teams in extracting chemical compounds from text.**

Pavkovič M., et al. (2013). Intelligent techniques for searching Internet forums, in *Zbornik dvaindvajsete mednarodne Elektrotehniške in računalniške konference ERK 2013*, Portorož, Slovenija, 16.-18. september 2013, pp. 85-88. □

Žitnik S., et al. (2013). Iterative end-to-end information extraction based on linear models, in *Zbornik dvaindvajsete mednarodne Elektrotehniške in računalniške konference ERK 2013*, Portorož, Slovenija, 16.-18. september 2013, pp. 47-50. □

Žitnik S., Žitnik M., Zupan B. and Bajec M. (2013). Extracting gene regulation networks using linear-chain conditional random fields and rules, in *BioNLP shared task 2013: ACL 2013 - Proceedings of the workshop*, Sofia, Bulgaria, 4.-9. August 2013, pp. 178-187. □ **First place in extracting relationships between genes and proteins.**

Lavbič D., Žitnik S., et al. (2012). Traversal and relations discovery among business entities and people using semantic web technologies and trust management, in *Databases and information systems VII : selected papers from the Tenth International*

*Baltic Conference, DB&IS 2012*, pp. 164-174. □

Žitnik S., et al. (2012). Collective information extraction using first-order probabilistic models, in *BCI 2012 : proceedings*, Novi Sad, Serbia, 16.-19. September 2012, pp. 279-282. □

Žitnik S. (2012). Collective ontology-based information extraction using probabilistic graphical models, in *CAISE-DC-2012 : proceedings of CAiSE 2012 Doctoral Consortium, Gdansk, Poland, June 26, 2012*. □

Šubelj L., Žitnik S., et al. (2012). Lastnosti velikih realnih omrežij in primeri uporabe, in *Ustvarimo nove rešitve!: zbornik prispevkov*, 19. konferenca Dnevi slovenske informatike, Portorož, 16.-18. april 2012, pp. 1-10. □

Zrnc A., et al. (2012). Podatkovne baze NOSQL, in *Ustvarimo nove rešitve!: zbornik prispevkov*, 19. konferenca Dnevi slovenske informatike, Portorož, 16.-18. april 2012, pp. 1-10. □

Bajec M., et al. (2011). Supervizor+, in *Informatika v luči reforme javne uprave: zbornik konference Informatika v javni upravi*, 28.-29. november 2011, Kongresni center Brdo pri Kranju, pp. 1-6. □

Žitnik S., et al. (2010). Trendi v inteligentnem pridobivanju podatkov iz heterogenih virov, in *Zbornik Konference Informatika v Javni Upravi 2010*. □

Šubelj L., et al. (2010). Analiza kompleksnih omrežij: Osnovni pojmi in primeri uporabe v praksi, in *Zbornik Konference Informatika v Javni Upravi 2010*. □