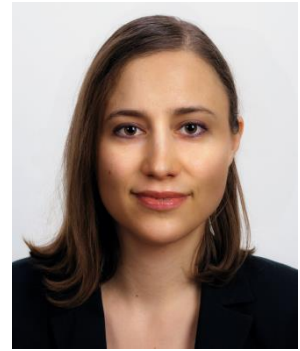Department of Knowledge Technologies
Jožef Stefan Institute
Jamova cesta 39
SI-1000 Ljubljana
Slovenia
vedrana.vidulin@ijs.si
http://vedranavidulin.com

Vedrana Vidulin
PhD

CV – November 26, 2016

CURRENT POSITION

November 2016-present – Researcher:
> Department of Knowledge Technologies, Jožef Stefan Institute, Ljubljana, Slovenia.
> http://kt.ijs.si/

PREVIOUS POSITIONS

March 2014-November 2016 – Postdoc position:
> Computational Biology and Bioinformatics Group, Division of electronics, Ruđer Bošković Institute, Zagreb, Croatia.

December 2005-March 2014 – PhD:
> Department of Intelligent Systems, Jožef Stefan Institute in Ljubljana, Slovenia.

EDUCATION

February 2012 – PhD:
> PhD in computer science at Jožef Stefan International Postgraduate School in Ljubljana, Slovenia. Thesis in the field of interactive machine learning with the title "Searching for credible relations in machine learning". (Grade: 10/10)

September 2005 – BSc:
> BSc in computer science and pedagogy at Faculty of Philosophy, University of Rijeka, Croatia: undergraduate thesis on the topic of neural networks. (Grade: 4.9/5)

SUMMARY OF RESEARCH EXPERIENCE

I undertook undergraduate study at the University of Rijeka in Croatia where I studied computer science and pedagogy and graduated as the highest ranked student in the class. During undergraduate study I gained interest in machine learning and have written BSc thesis on the topic of neural networks. Afterwards, I enrolled to PhD study at Jožef Stefan International Postgraduate School in Slovenia. During the first year of PhD I started to work on two research topics. The first dealt with the analysis of macroeconomic data with an aim to extract indicators describing performance of high-level knowledge producing sectors that are related to economic welfare of a country. To address the issue of instability of interpretable models constructed from the macroeconomic data with state-of-the-art machine learning algorithms, we proposed interactive machine learning method named Human-Machine Data Mining. The method constructs an ensemble of decision tree models through iterative model construction and selection process guided by model accuracy from the computer side and semantics from the human side. This work resulted in PhD thesis and several papers of which (Vidulin *et al.*, 2014) was published in a leading international journal. The second topic was related to my work on EU STREP project ALVIS from which my PhD study was financed before obtaining scholarship. The project aimed at building a semantic search engine and my task was to construct a module for web genre classification. Genre is a form and function of a web page (e.g., scientific article, blog) and as such complements topic-based keyword search. My contribution to the field was introduction of multi-label classification to machine learning-based web genre classifier construction. My work was recognized at web genre classification workshop (Vidulin *et al.*, 2007) and I was a part of the initiative to construct a benchmark corpus for evaluating web genre classifiers (Rehm *et al.*, 2008). Extended conference paper was invited to special web genre classification journal issue (Vidulin *et al.*, 2009).

After submitting PhD thesis I started to work on applicative project E-doorman where the aim was to construct an intelligent system that would perform duties of a human doorman. Since I had a role of operative leader, I was in contact with partners from industry, and learned how to communicate results of academic research to non-academic partners. I was also leading a group of undergraduate, MSc and PhD students that were working on modules of the system. Afterwards I applied to the postdoc position at Ruđer Bošković Institute in Croatia, where I worked on EU FET project MAESTRA on the task of gene function prediction. Here, I showed on a big scale that complementarity between state-of-the-art gene function prediction methods is extensive and that in such setting the best choice is to select the integration scheme that relies on the vote of most confident method. This work resulted in a publication in leading journal (Vidulin *et al.*, 2016) and another manuscript that will be soon submitted to journal. As part of the same project I continued with the work on web genre classification. We extended my previous work with automatic construction of hierarchies over genre labels and employed machine learning algorithm that can exploit that hierarchy to construct more accurate classification model. This work resulted in awarded conference paper and extended version is currently under review in high-impact journal. After completing postdoc in Zagreb I continued with my work on gene function prediction at Jožef Stefan Institute at the Department of Knowledge Technologies.

FELLOWSHIPS AND AWARDS

October 2015 – Best paper award at IDEAL 2015

2014-2016 – Postdoctoral fellowship financed from the EU project MAESTRA.

2012-2013 – Financed from the applicative project E-doorman (postdoc)

2006- 2011 – Scholarship of the Slovene Human Resources Development and Scholarship Fund for foreigners pursuing doctoral studies in natural sciences, technology and medicine (postgraduate study)

2005- 2006 – Financed from the EU project ALVIS (postgraduate study)

2003 – Rector's award for the highest academically ranked student in the class (undergraduate study)

1999-2003 – National scholarship for talented students (undergraduate study)

TEACHING AND TRAINING ACTIVITIES

2011-2014 – Supervision of bachelor, master and PhD students at Department of Intelligent Systems.

2013 – Teaching assistant at Jožef Stefan International Postgraduate School – course Cognitive Sciences for PhD students.

2003 – During undergraduate study I worked with 7th and 8th grade students, preparing them for competition in computer programming.

ORGANISATION OF INTERNATIONAL SCIENTIFIC MEETINGS

2012-2013 – Organizational committee co-chair of International Multiconference Information Society

PROFESSIONAL MEMBERSHIPS

2006-present – Slovenian Artificial Intelligence Society
2013-present – Slovenian Cognitive Science Society

PUBLICATIONS IN JOURNALS

Vidulin, V., Šmuc, T., Supek, F. (2016) Extensive complementarity between gene function prediction methods. *Bioinformatics*, doi:10.1093/bioinformatics/btw532. Impact factor: **5.766**.

Brbić, M., Piškorec, M., **Vidulin, V.**, Kriško, A., Šmuc, T. Supek, F. (2016) The landscape of microbial phenotypic traits and associated genes. *Nucleic Acids Research*, doi: 10.1093/nar/gkw964. Impact factor: **9.202**.

Vidulin, V., Bohanec, M., Gams, M. (2014) Combining human analysis and machine data mining to obtain credible data relations. *Information Sciences*, 288, 254-278. Impact factor: **3.893**.

Vidulin, V., Gams, M. (2011) Impact of high-level knowledge on economic welfare through interactive data mining. *Applied artificial intelligence, 25(4), 267-291*. Impact factor: **0.580**.

PUBLICATIONS IN JOURNALS WITHOUT IMPACT FACTOR

Vidulin, V. (2013) Searching for credible relations in machine learning. *Informatica*, 37(3).

Vidulin, V., Luštrek, M., Gams, M. (2009) Multi-label approaches to web genre identification. *Journal for Language Technology and Computational Linguistics*, 24(1), 93-110.

Vidulin, V., Luštrek, M., Gams, M. (2007) Training a genre classifier for automatic classification of web pages. *Journal of Computing and Information Technology*, 15(4), 305-311.

Vidulin, V., Gams, M. (2006) Analyzing the impact of investment in education and R&D on economic welfare with data mining. *Electrotechnical Review*, 73(5), 285-290.

Vidulin, V. (2006) Constructivist learning theory as a link between artificial neural networks and intelligent tutoring systems. *Organizacija*, 39(2), 154-156.

SELECTED PUBLICATIONS IN CONFERENCE PROCEEDINGS

Vidulin, V. and Brbić, M., Supek, F., Šmuc, T. (2016) Evaluation of fusion approaches in large-scale bio-annotation setting. In *Proceedings of the 4ᵗʰ Workshop on Machine Learning in Life Sciences (MLLS); Organized under: European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases 2016 (ECML PKDD)*, Riva del Garda, Italy. (Note: the first two authors are joint first authors).

Madjarov, G. and **Vidulin, V.**, Dimitrovski, I., Kocev, D. (2015) Web genre classification via hierarchical multi-label classification, In *Proceedings of the 16th International Conference on Intelligent Data Engineering and Automated Learning (IDEAL 2015)* (pp. 9-17), Wroclaw, Poland, Springer International Publishing, Lecture notes in computer science. (Note: the first two authors are joint first authors) – **Best paper award**.

Rehm, G., Santini, M., Mehler, A., Braslavski, P., Gleim, R., Stubbe, A., Symonenko, S., Tavosanis, M., **Vidulin, V.** (2008) Towards a reference corpus of web genres for the evaluation of genre identification systems. In *Proceedings of the 6ᵗʰ International Conference on Language Resources and Evaluation (LREC 2008)*, Marrakech, Morocco, pp. 351-358.

Vidulin, V., Luštrek, M., and Gams, M. (2007) Using genres to improve search engines. *Towards Genre-Enable Search Engines: the Impact of Natural Language Processing – Proceedings of International Workshop*, Borovets, Bulgaria, pp. 45-51.

Vidulin, V., Luštrek, M., and Gams, M. (2007) Evaluation of Different Approaches to Training a Genre Classifier. Proceedings of the 2007 International Conference on Artificial Intelligence and Pattern Recognition – AIPR-07, Orlando, Florida, USA, pp. 515-520.

POSTERS

Vidulin, V., Šmuc, T., Supek, F. (2015) Predicting Microbial Gene Function on a Massive Scale Reveals Extensive Complementarity between Genome Context Methods. *23ʳᵈ Annual International Conference on Intelligent Systems for Molecular Biology/14ᵗʰ European Conference on Computational Biology (ISMB/ECCB 2015)*, Dublin, Ireland.

Vidulin, V., Šmuc, T., Supek, F. (2014) Speed and accuracy benchmarks of large-scale microbial gene function prediction with supervised machine learning. *17ᵗʰ International Conference on Discovery Science (DS 2014)*, Bled, Slovenia.

SOFTWARE

Human-machine data mining - http://vedranavidulin.com/ human-machine-data-mining

E-doorman - http://dis.ijs.si/e-vratar