

Michal Valko

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- EDUCATION
- ◇ **University of Pittsburgh**, Pittsburgh, PA (GPA 4.0)
PhD in Machine Learning, 4th year, post-comps, expected graduation: Fall 2010.
 - ◇ **Comenius University Bratislava**, Slovakia. (GPA 3.96)
MSc., Summa cum laude in Computer Science, June 2005.
Majors: Artificial Intelligence (GPA 4.0) and Mathematical Methods of CS (GPA 4.0)
Thesis title: *Evolving Neural Networks for Statistical Decision Theory*.
 - ◇ **Scholarships/Awards/Internships**
 - Intel Research Internship (Spring 2009)
 - Andrew Mellon Predoctoral Fellowship (Fall 2008, Summer 2009)
 - Research Assistantship (Spring 2006 – Spring 2008)
 - Teaching Assistantship (Fall 2005)
 - European Erasmus Scholarship, Lisbon, Portugal (Spring 2005)
 - Slovak Academy of Sciences (2003 – 2005)
- RESEARCH INTERESTS
- machine learning, anomaly detection, distance metric learning, online semi-supervised learning, structured prediction, bioinformatics, pattern classification, graphical models, spiking neuron networks
- RESEARCH PROJECTS
- ◇ *Online semi-supervised learning* with Branislav Kveton (2009)
I extended graph-based semi-supervised learning to the structured case and demonstrated on handwriting recognition and object detection from video streams. Regularized harmonic function solution: The algorithm outputs a confidence of inference and uses it for learning.
 - ◇ *Anomaly detection* with Milos Hauskrecht (2007 – present)
Statistical anomaly detection methods for identification of unusual outcomes and patient management decisions. I combined max-margin learning with distance learned to create and anomaly detector, which outperforms the hospital rule for Heparin Induced Thrombocytopenia detection.
 - ◇ *Mass Spec Bioinformatics* with Milos Hauskrecht (2005 – 2007)
Tools for analysis of high-throughput proteomic and genomic data sources. I found a way to merge heterogeneous data sources for mass spectrometry (Luminex and SELDI) and build a framework for the cancer prediction.
 - ◇ *Machine Learning* with Nuno Marques (2005)
Evolutionary feature selection algorithms for pattern recognition. I enhanced FeaSANNT selection with spiking neuron model and show that it can handle noised inputs.
 - ◇ *Plastic Synapses* with Juraj Pavlasek (2003 – 2005)
Modelling basic learning function at the level of synapses. Design of a model that is able to adapt to the regular frequencies with different a rate as the time flows. I used genetic programming to find biologically plausible networks that distinguish different gamma distribution and provided explanation of the strategies evolved.

- PUBLICATIONS UNDER REVIEW Wendy W. Chapman, John N. Dowling, Gregory F. Cooper, Milos Hauskrecht, **Michal Valko**, Will Bridewell: *Identifying Acute Lower Respiratory Syndrome from Emergency Department Texts*, Journal of American Medical Informatics Association (JAMIA 2009, *submitted*)
- PUBLICATIONS **Michal Valko**, Gregory Cooper, Amy Seybert, Shyam Visweswaran, Melissa Saul, Milos Hauskrecht: *Conditional anomaly detection methods for patient-management alert systems*, Workshop on Machine Learning in Health Care Applications in The Twenty-Fifth International Conference on Machine Learning (ICML 2008 - MLHealth)
- ◇ **Michal Valko**, Milos Hauskrecht: *Distance metric learning for conditional anomaly detection*, Twenty-First International Florida AI Research Society Conference (FLAIRS 2008)
 - ◇ **Michal Valko**, Richard Pelikan, Milos Hauskrecht: *Learning predictive models for multiple heterogeneous proteomic datasources*, AMIA Summit on Translational Bioinformatics (STB 2008) [**paper award**]
 - ◇ Milos Hauskrecht, **Michal Valko**, Branislav Kveton, Shyam Visweswaram, Gregory Cooper: *Evidence-based Anomaly Detection in Clinical Domains* in Annual American Medical Informatics Association conference (AMIA 2007) [**nominated for the best paper award**]
 - ◇ Wendy W. Chapman, John N. Dowling, Gregory F. Cooper, Milos Hauskrecht, **Michal Valko**: *A Comparison of Chief Complaints and Emergency Department Reports for Identifying Patients with Acute Lower Respiratory Syndrome* in Proceedings of the National Syndromic Surveillance Conference (ISDS 2006)
 - ◇ Milos Hauskrecht, Richard Pelikan, **Michal Valko**, James Lyons-Weiler: *Feature Selection and Dimensionality Reduction in Genomics and Proteomics*. Fundamentals of Data Mining in Genomics and Proteomics, eds. Berrar, Dubitzky, Granzow. Springer (2006)
 - ◇ **Michal Valko**, Nuno C. Marques, Marco Castelani: *Evolutionary Feature Selection for Spiking Neural Network Pattern Classifiers* in Proceedings of Portuguese Conference on Artificial Intelligence (EPIA 2005), eds. Bento et al., IEEE, p. 24-32
 - ◇ **Michal Valko** *Evolving Neural Networks for Statistical Decision Theory*, Comenius University, Bratislava, master thesis, advisor: Radoslav Harman (2005)
- PRESENTATIONS
- ◇ **Michal Valko**: *Conditional anomaly detection with adaptive similarity metric*, Presented at CS Department Research Competition (2008) [**1st place**]
 - ◇ **Michal Valko**, Milos Hauskrecht, G. Cooper, S. Visweswaran, M. Saul, A. Seybert, J. Harrison, A. Post: *Conditional Anomaly Detection*, Presented at (CS Day 2008), Poster [**1st by people, 2nd by faculty**]
 - ◇ **Michal Valko**, Milos Hauskrecht, G. Cooper, S. Visweswaran, M. Saul, A. Seybert, J. Harrison, A. Post: *Conditional Anomaly Detection in Medical Domains*, Presented at University of Pittsburgh, Arts & Sciences (Grad Expo 2008), Poster
- WORK EXPERIENCE
- ◇ **Intel Research Internship**, Intel, Santa Clara, CA (2009)
Online semi-supervised learning. Max-margin structured prediction.
 - ◇ **Research Assistant**, University of Pittsburgh (2007-2009)
Conditional Anomaly Detection project: System for Anomaly Detection in Medicine
 - ◇ **Research Assistant**, University of Pittsburgh (2006)
Bioinformatics: Tools for preprocessing, analysis of high-throughput proteomic and genomic data and biomarker discovery.
 - ◇ **Teaching Assistant**, University of Pittsburgh (Fall 2005)
CS7 course: Introduction to Programming
 - ◇ **Research Assistant**, Institute of Normal and Pathological Physiology (2003 - 2005)
Slovak Academy of Sciences, Bratislava, Slovakia

- ◇ **Research Fellow**, Centro de Inteligência Artificial, (Spring 2005)
Universidade Nova de Lisboa, Portugal
- ◇ **Organizer and Lecturer**, Math Seminars in Slovakia (1998 – 2005)
Math Competitions, Math Summer Camps, Slovakia
- ◇ **Cashier/Cook/Pizza maker**, Work and Travel USA (Summer 2004)
Sandwich Haven & Pizza, Marthas Vineyard, MA, USA
- ◇ **Web developer/designer**, freelance (1996 – 2004)

- CONTESTS
- ◇ Best Graduate Student Research Award, Computer Science, University of Pittsburgh, 2008
 - ◇ 1st place, Slovak Mathematical Olympiad, regional final 1993, 1994, 1996
 - ◇ 9th place, Programming Contest Zenit (national final) 1998
 - ◇ Correspondence seminars in Computer Science and Math 1992 – 2000 consistently ranked in top 10 nation-wide

- SKILLS &
HOBBIES
- ◇ C/C++, Java, LISP, Maple, R, Matlab, SmallTalk, PHP, SQL, T_EX, GTK+, Delphi, CL
 - ◇ English, Czech and Slovak (native language), passive knowledge of French
 - ◇ Reviewer for IJCAI
 - ◇ Member, Union of Slovak Mathematicians and Physicists Scientific Society (2000 – present)
 - ◇ Member, Slovak Chemical Society (1997 – 2002)
 - ◇ Member, Academic Senate, Comenius University, Bratislava, Slovakia (2003 – 2005)
 - ◇ Volunteer, Tree of Life, environmental group (2003)
 - ◇ Volunteer in various correspondence math seminars (1998 – 2005)
 - ◇ Volleyball Player, TU Slavia, Kosice (1998 – 2000)
 - ◇ Singer: Dominik Choir (1990–1991), St. Paul’s Choir (2007), First Baptist Choir (2007 –)
Taken private lessons with Richard Earl Teaster, Claudia Pinza and Jana Burášová

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