Tomasz G. Smolinski

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EDUCATION

05/2000 – 12/2004
Ph.D., Computer Science and Engineering
University of Louisville (UofL), Kentucky, USA
Dissertation: Classificatory Decomposition for Time Series Clustering and Categorization

10/1998 – 05/2000
M.S., Computer Science
Polish-Japanese Institute of Information Technology (PJIIT), Warsaw, Poland (formerly PJICT)
Specialization: Knowledge Discovery in Databases
Thesis: An Application of Methods of Data Exploration to the Analysis of Neuro-Biological Evoked Potentials
Specialization: Multimedia and Artificial Intelligence
Thesis: A System to Investigate Visual and Auditory Sensory Correlation in Image Perception in the Presence of Surround Sound

10/1995 – 09/1998
B.E., Computer Engineering
Polish-Japanese Institute of Computer Techniques (PJICT), Warsaw, Poland
Specialization: Intelligent Decision Support Systems

ADDITIONAL EDUCATION AND CERTIFICATES

08/2002 – 04/2003
"Future Professors Program" training at UofL – a year-long training regimen for prospective college and university professors. The program included:

- A credit-bearing graduate course on college teaching
- Seminars on writing for publication, grant proposal writing, mentoring, assessment of learning outcomes, tenure and promotion, and other professional topics
- Development of a professional portfolio
- Intensive work with a faculty mentor

RESEARCH AND ACADEMIC BACKGROUND

Emory University **Atlanta, Georgia**

07/2005 – present

Postdoctoral Fellow in the Prinz Lab at the Biology Department

- Implemented computational models for simulations of neural activity to study pattern generations and homeostatic regulation in small neural networks
- Implemented various machine learning- and artificial intelligence-based data mining algorithms for exploration and analysis of homeostatic regulation parameter spaces

University of Louisville **Louisville, Kentucky**

12/2004 – 06/2005

Postdoctoral Research Associate at the Office of the Senior Vice President for Research (SVPR)

- Researched and implemented various machine learning- and artificial intelligence-based data mining algorithms for Facilities and Administrative (F&A) cost analysis and forecasting
- Prepared a comprehensive User Manual for the designed computer application "SVPR – Overhead Forecaster 1.0"
- Assisted with development of a Space Management database, including field testing, data collection and training of unit database managers/maintainers
- Interacted with the research community to foster greater utilization of computational intelligence techniques in everyday research

06/2002 – 12/2004

Graduate Research Assistant at the Office of the Senior Vice President for Research (SVPR)

- Prepared a formal proposal for, and led the research-and-development part of, the internally funded research project titled "Overhead Forecasting for the University of Louisville's Research Administration"
- Collected, managed, and analyzed historical data for recommendations to the Research Administration
- Designed and implemented a database system and an MS Windows-based application for the overhead analysis and forecasting
- Interpreted results, prepared reports and presentations, as well as articles for international conferences
- Applied methodologies: statistical data analysis, rough set theory, artificial neural networks

05/2000 – 12/2004

Member of the Computational Intelligence Laboratory (CILab)

- Conducted research on:
  - Analysis and modeling of cortical evoked potentials via computational intelligence-based signal decomposition techniques *(cooperation with the Laboratory of Visual System of the Nencki Institute of Experimental Biology, Warsaw, Poland and the Department of Computer Science, University of Arkansas, Little Rock, AR, USA)*

  - Proteomics-based myeloma cancer detection using methods of data mining and knowledge discovery
    (cooperation with the Department of Computer Science, University of Arkansas; the Department of Orthopedic Surgery, University of Arkansas for Medical Sciences; and the Barton Research Institute of the Department of Physiology and Biophysics, University of Arkansas for Medical Sciences, Little Rock, AR, USA)
- Applied methodologies: statistical data analysis, genetic algorithms, pseudo-association rule mining, rough set theory, sparse coding with overcomplete bases, classificatory decomposition of signals
- Actively participated in the CILab seminar series – delivered lectures on various topics including: rough set theory, support vector machines, time series analysis and modeling, *etc.*

05/2000 – 05/2002 **Graduate Research Assistant** at the UPS Center for World-Wide Supply Chain Management (UPS*i*) of the Logistics and Distribution Institute (LoDI)

- Conducted research on applications of data mining and knowledge discovery to logistics, distribution, and supply chain management-related problems (*e.g.*, survey-based profiling and classification, rule discovery, and pattern mining)
- Implemented several databases, data warehouses, and data mining-based systems and applications supporting the research
- Applied methodologies: statistical data analysis, genetic algorithms, pseudo-association rule mining, rough set theory
- Actively participated in the LoDI/UPS*i* research seminar series – delivered lectures on various topics including: genetic algorithms, association and pseudo-association rule mining, *etc.*

Polish – Japanese Institute of Information Technology **Warsaw, Poland**

10/1998 – 05/2001 **"Multimedia and Artificial Intelligence" specialization (Master of Science)**

- Conducted research on analysis of physiological interdependencies between the hearing and sight senses
  (cooperation with the Multimedia Systems Department, Gdansk University of Technology, Gdansk, Poland)
- Implemented an MS Windows-based system for analysis of the associated phenomena
- Applied methodologies: statistical data analysis, genetic algorithms, association rule mining
- Actively participated in lecturing in courses associated with the specialization – delivered lectures on various topics related to signal registration and processing, *etc.*

10/1998 – 05/2000 **"Knowledge Discovery in Databases" specialization (Master of Science)**

- Conducted research on analysis of micro-EEG signals
  (cooperation with the Laboratory of Visual System of the Nencki Institute of Experimental Biology, Warsaw, Poland)

- Applied methodologies: statistical data analysis, genetic algorithms, association rule mining, rough set theory
- Actively participated in the specialization's research seminar series – delivered lectures on various topics including: genetic algorithms, association rule mining, databases and data warehouses, *etc.*

Polish – Japanese Institute of Computer Techniques **Warsaw, Poland**

10/1997 – 09/1998 **"Intelligent Decision Support Systems" specialization (Bachelor of Engineering)**

- Implemented a rough sets-based data analysis system

10/1997 – 09/1998 **"Intelligent Data Analysis" project and seminar series**

- Conducted research on:
  - Fraud detection in income tax-related data *(cooperation with the Polish Ministry of Finances and the SAS Institute)*
  - Analysis of the impact of the zodiac sign on the academic performance *(cooperation with the SAS Institute)*
- Applied methodologies: statistical data analysis, rough set theory
- Actively participated in the seminar series – delivered lectures on various topics including: rough set theory, data mining, data warehousing, on-line analytical processing, *etc.*

REFEREED PUBLICATIONS

- Smolinski, T.G., Buchanan, R., Boratyn, G.M., Milanova, M., and Prinz A.A., "Independent Component Analysis-motivated Approach to Classificatory Decomposition of Cortical Evoked Potentials," BMC Bioinformatics, 7 (Suppl 2):S8, 2006.

- Smolinski, T.G., Soto-Treviño, C., Rabbah, P., Nadim F., and Prinz, A.A., "Analysis of Biological Neurons via Modeling and Rule Mining," International Journal of Information Technology and Intelligent Computing, 1(2), 2006, pp. 293 – 302.

- Smolinski, T.G., Boratyn, G.M., Milanova, M., Buchanan, R., and Prinz A.A., "Hybridization of Independent Component Analysis, Rough Sets, and Multi-Objective Evolutionary Algorithms for Classificatory Decomposition of Cortical Evoked Potentials," Proc. of the 2006 Workshop on Pattern Recognition in Bioinformatics 2006 (PRIB 2006) , Hong Kong, China, August 2006, Lecture Notes in Bioinformatics 4146, pp. 174 – 183.

- Smolinski, T.G., Milanova, M., Boratyn, G.M., Buchanan, R., and Prinz A.A., "Multi-Objective Evolutionary Algorithms and Rough Sets for Decomposition and Analysis of Cortical Evoked Potentials," Proc. of the IEEE International Conference on Granular Computing (GrC 2006), Atlanta, Georgia, May 2006, pp. 635 – 638.

- Smolinski, T.G., Chenoweth, D.L., and Zurada, J.M., "Application of Rough Sets and Neural Networks to Forecasting University Facility and Administrative Cost Recovery," Proc. of the 7th International Conference on Artificial Intelligence and Soft Computing (ICAISC 2004), Zakopane, Poland, June 2004, Lecture Notes in Artificial Intelligence 3070, pp. 538 – 543.

- Boratyn, G.M., Smolinski, T.G., Zurada, J.M., Milanova, M., Bhattacharyya, S., and Suva, L.J., "Hybridization of Blind Source Separation and Rough Sets for Proteomic Biomarker Identification," Proc. of the 7th International Conference on Artificial Intelligence and Soft Computing (ICAISC 2004), Zakopane, Poland, June 2004, Lecture Notes in Artificial Intelligence 3070, pp. 486 – 491.

- Boratyn, G.M., Smolinski, T.G., Milanova, M., Zurada, J.M., Bhattacharyya, S., and Suva, L.J., "Bayesian Approach to Analysis of Protein Patterns for Identification of Myeloma Cancer," Proc. of the 2nd International Conference on Machine Learning and Cybernetics (ICMLC 2003), Xi'an, China, November 2003, pp. 1217 – 1121.

- Boratyn, G.M., Smolinski, T.G., Milanova, M., Zurada, J.M., Bhattacharyya, S., and Suva, L.J., "Scoring-based Analysis of Protein Patterns for Identification of Myeloma Cancer," Proc. of the International Conference on Mathematics and Engineering Techniques in Medicine and Biological Sciences (METMBS'03), Las Vegas, Nevada, June 2003, pp. 60 – 65.

- Smolinski, T.G., Chenoweth, D.L., and Zurada, J.M., "Time Series Prediction Using Rough Sets and Neural Networks Hybrid Approach," Proc. of the IASTED International Conference on Neural Networks and Computational Intelligence (NCI 2003), The International Association of Science and Technology for Development, Cancun, Mexico, May 2003, pp. 108 – 111.

- Smolinski, T.G., Boratyn, G.M., Milanova, M., Zurada, J.M., and Wrobel, A., "Evolutionary Algorithms and Rough Sets-based Hybrid Approach to Classificatory Decomposition of Cortical Evoked Potentials," Proc. of the 3rd International Conference on Rough Sets and Current Trends in Computing (RSCTC 2002), Malvern, Pennsylvania, October 2002, Lecture Notes in Artificial Intelligence 2475, pp. 621 – 628.

- Milanova, M., Smolinski, T.G., Boratyn, G.M., Zurada, J.M., and Wrobel, A., "Sparse Correlation Kernel Analysis and Evolutionary Algorithm-based Modeling of the Sensory Activity within the Rat's Barrel Cortex," Proc. of the International Workshop on Pattern Recognition with Support Vector Machines (SVM 2002), Niagara Falls, Canada, August 2002, Lecture Notes in Computer Science 2388, pp. 198 – 212.

- Min, H., Smolinski, T.G., and Boratyn, G.M., "A Genetic Algorithm-based Data Mining Approach to Profiling the Adopters and Non-Adopters of E-Purchasing," Proc. of the 3rd International Conference on Information Reuse and Integration (IRI 2001), The International Society for Computers and their Applications, Las Vegas, Nevada, November 2001, pp. 1 – 6.

- Odya, P. and Smolinski, T., "Investigation of the Influence of Video Context on Perception of Surround Sound Using Genetic Algorithms [in Polish]," Proc. of the 9th International Symposium on Sound Engineering and Tonmeistering (ISSET 2001), Fryderyk Chopin Academy of Music in Warsaw, Poland, October 2001, pp. 204 – 209.
  (Among three projects awarded with the Foundation for the Support of Radio-Communication and Multimedia Technologies Development Prize)

- Czyzewski, A., Kostek, B., Odya, P., Smolinski, T., and Tchorzewski, T., "Discovering the Influence of Visual Stimuli on the Perception of Surround Sound Using Genetic Algorithms," Proc. of the AES 19th International Conference on Surround Sound - Techniques, Technology, and Perception, Schloss Elmau, Germany, June 2001, pp. 287 – 294.

NON-REFEREED CONFERENCE PRESENTATIONS AND ABSTRACTS

- Buchanan, R., Milanova, M., Smolinski, T.G., Boratyn, G.M., and Prinz, A.A., "Decomposition and Analysis of Cortical Evoked Potentials using ICA," 3rd Annual MidSouth Computational Biology and Bioinformatics Society Conference (MCBIOS 2006), Baton Rouge, Louisiana, February 2-4, 2006.

- Smolinski, T.G., Prinz, A.A., Soto-Treviño, C., Rabbah, P., and Nadim F., "Computational Exploration of a Multi-Compartment Model of the Lobster Pyloric Pacemaker Kernel," Society for Neuroscience 35th Annual Meeting, Washington, D.C., November 12-16, 2005.

- Smolinski, T.G., Soto-Treviño, C., Rabbah, P., Nadim F., and Prinz, A.A., "Application of evolutionary algorithms-based pseudo-association rule mining to analysis of the intrinsic properties of the PD neuron in the lobster pyloric network," Second SECABC Fall Workshop on Biocomputing, Atlanta, Georgia, October 27, 2005.

- Smolinski, T.G., Boratyn, G.M., Zurada, J.M., Milanova, M., and Wrobel, A., "Multi-Objective Evolutionary Algorithms and Rough Sets-based Classificatory Decomposition of Evoked Potentials," Research!Louisville 2004, Louisville, Kentucky, November 11, 2004.

- Boratyn, G.M., Smolinski, T.G., Zurada, J.M., and Milanova, M., "Classification of Shapes with RBF Network for Biomarker Identification in SELDI Proteomic Profiles," Research!Louisville 2004, Louisville, Kentucky, November 11, 2004.

- Boratyn, G.M., Smolinski, T.G., Milanova, M., Zurada, J.M., Bhattacharyya, S., and Suva, L.J., "Signal Decomposition and Rough Sets for Feature Extraction in Protein Profiles," 1st Annual MidSouth Computational Biology and Bioinformatics Society Conference (MCBIOS 2003), Little Rock, Arkansas, November 13-16, 2003.

- Boratyn, G.M., Smolinski, T.G., Milanova, M., and Wrobel, A., "Sparse Coding and Rough Set Theory-based Hybrid Approach to the Classificatory Decomposition of Cortical Evoked Potentials," 9th International Conference on Neural Information Processing (ICONIP 2002), Orchid Country Club, Singapore, November 18-22, 2002.

- Odya, P., Czyzewski, A., Kostek, B., and Smolinski, T., "Determining the Influence of Visual Stimuli on the Perception of Surround Sound Using Data Mining Algorithms," *The Journal of the Acoustical Society of America*, Vol. 110, No. 5, p. 2679. (Abstract from a poster session held at the 142nd Meeting of the Acoustical Society of America, December 2001.)

RELATED WORK EXPERIENCE

KAMIL, IT Services **Warsaw, Poland**

1995 - 2000 **IT Consultant, Programmer (part time)**

- Developed information systems for car manufactures, warehouses, laboratories, *etc.*
- Responsibilities included: system analysis, negotiations, group management, system project and design, programming, database implementation, project administration and maintenance

PROFESSIONAL MEMBERSHIPS

- Institute of Electrical and Electronics Engineers (IEEE), including: Computational Intelligence Society, Computer Society, Education Society, Engineering in Medicine and Biology Society, Signal Processing Society
- American Association for Artificial Intelligence (AAAI)
- Society for Neuroscience (SfN)
- Audio Engineering Society (AES)
- Tau Beta Pi (ΤΒΠ), The Engineering Honor Society

LANGUAGES

English	fluent
Polish	fluent
Japanese	beginner's level in speaking and writing
Modern Greek	beginner's level in speaking and writing
Russian	basics in speaking