

# WOJCIECH KOTŁOWSKI

## *Curriculum Vitae*

### Contact Information

*Address* Laboratory of Intelligent Decision Support Systems  
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### Employment

*03/2012–present* Adjunct Professor in the Faculty of Computing at Poznań University of Technology.

*06/2009–02/2012* Postdoctoral Researcher in Centrum Wiskunde & Informatica (CWI), Algorithms and Complexity Group, Amsterdam, Netherlands.

*09/2008–05/2009* Research Assistant in the Laboratory of Intelligent Decision Support Systems at Poznań University of Technology.

### Academic Qualifications

*2018* Habilitation degree in Computer Science at Poznań University of Technology

*03/2009* Ph.D., Computer Science, Poznań University of Technology.  
Thesis: *Statistical Approach to Ordinal Classification with Monotonicity Constraints*.  
Advisor: Prof. Roman Słowiński.

*2006* M.Sc., Theoretical Physics, Adam Mickiewicz University, Poznań.  
Specialization: Quantum Information and Quantum Optics.

*2004* M.Sc., Computer Science, Poznań University of Technology.  
Specialization: Intelligent Decision Support Systems.

*2002* B.Sc., Computer Science, Poznań University of Technology.

### Grants, Scholarships, Awards

*2017–2021* SONATA BIS grant awarded by National Science Centre in Poland.

*2015–2017* SONATA grant awarded by National Science Centre in Poland.

*2013–2014* HOMING PLUS subsidy (5/2012) awarded by the Foundation for Polish Science.

*2011–2014* Stipend for outstanding young scientists awarded by Minister of Science and Higher Education.

*2012–2013* Grant for young scientists awarded by the Faculty of Computing at Poznań University of Technology (*Pro-IDEAS*).

*2009* City of Poznań Scholarship for Young Researchers.

*2007–2008* Beyond Search – Semantic Computing and Internet Economics 2007 RFP award sponsored by Microsoft Research and Microsoft adCenter Project: *AdRules: Improving Quality of Ads*.

*2005* Young Scientists Summer Program (YSSP) scholarship, Institute for Applied System Analysis (IIASA), Laxenburg, Austria.

*2004–2005* Polish Ministry of Education scholarship.

## Research Experience

2010–2016, 2018	Research visitor, University of California, Santa Cruz
01/2018	Research visitor, Universitat Pompeu Fabra
08-09/2012	Research visitor and co-organizer of the Workshop on Information Theoretic Methods in Science and Engineering (WITMSE 2012), Centrum Wiskunde & Informatica, Amsterdam.
2012	Research project for TPSA (Polish telecommunications corporation), <i>Adaptive learning algorithms for natural language processing</i> .
02/2010	Research visitor, University of Nottingham, UK
02/2009–05/2009	Research project for NaviExpert (GPS navigation company), <i>Improving the Travel Time Prediction by Using the Real-time Floating Car Data</i> .
2008–2009	Participant in grant N N519 314435 of Polish Ministry of Science and Higher Education, <i>Computational Methods for Decision Support based on Inductive Learning from Alphanumerical and Textual Data</i> , headed by Prof. Roman Słowiński.
02/2007	Research visitor, International Institute for Applied System Analysis (IIASA), Laxenburg, Austria.
06/2005–08/2005	Participant of the Young Scientists Summer Program (YSSP), IIASA, Laxenburg, Austria. Project title: <i>Qualitative Models of Climate Variations Impact on Crop Yields</i> .
2004–2007	Participant in grant 3T11F 02127 of Polish Ministry of Science and Higher Education headed by Prof. Roman Słowiński.
07/2002	Internship at Joint Institute for Nuclear Research (JINR), Dubna, Russia.

## Teaching

2017-18	<i>Probabilistic Methods</i> , Poznań University of Technology.
2018	<i>Continuous Optimization</i> , Poznań University of Technology.
2013-18	<i>Calculus and Linear Algebra for Bioinformatics</i> , Poznań University of Technology.
2012-18, 2008, 2007	<i>Statistics and Data Analysis</i> , Poznań University of Technology.
2012-18, 2008, 2006	<i>Optimization Techniques</i> , Poznań University of Technology.
2011, 2010	<i>Statistical Learning</i> (lecturer, jointly with Prof. Peter Grünwald and Prof. Jacqueline Meulman), Leiden University, Netherlands.
2008	<i>Data Mining</i> , Poznań University of Technology.
2008	<i>Data Warehouses and Data Exploration</i> , Poznań University of Technology.
2005	<i>Software Engineering</i> , Poznań University of Technology.

## Scientific Activities

Coorganizer of conferences	Workshop on Information Theoretic Methods in Science and Engineering (WITMSE) 2012, Amsterdam, Netherlands; Meeting of the European Working Group in Multiple Criteria Decision Aid (MCDA) 2007, Poznań, Poland.
Reviewer for conferences	International Conference on Machine Learning (ICML) 2018, 2016, 2014, 2013, 2012, Neural Information Processing Systems (NIPS) 2018, 2017, 2016, 2015, 2014, Algorithmic Learning Theory (ALT) 2019, 2018, Conference on Uncertainty in Artificial Intelligence (UAI) 2014, 2013, 2010, Conference on Learning Theory (COLT) 2015 (Program Committee member), 2018, 2017, 2016, 2014, 2012, 2011 (external), Conference on Artificial Intelligence (AAAI) 2012, Conference on Artificial Intelligence and Statistics (AISTATS) 2016, 2011, International Joint Conference on Artificial Intelligence (IJCAI) 2015, 2011, IEEE International Symposium on Information Theory (ISIT) 2011, 2010, Rough Set and Current Trends in Computing (RSCTC) 2010, 2006, European Conference on Machine Learning (ECML) 2008.
Reviewer for journals	Journal of Machine Learning Research (JMLR), Machine Learning Journal (MLJ), Journal of the American Statistical Association (JASA), Artificial Intelligence Journal (AIJ), European Journal of Operational Research (EJOR), Information Sciences (INS), Operational Research – an International Journal (ORIJ).

## Publications in Peer-Reviewed Conference Proceedings

- van der Hoeven, D., van Erven, T., and Kotłowski, W. (2018) The many faces of exponential weights in online learning. *Proceedings of the 31st Conference On Learning Theory (COLT)*, vol. 75 of *Proceedings of Machine Learning Research*, pp. 2067–2092, PMLR
- Kotłowski, W., Koolen, W. M., and Malek, A. (2017) Random permutation online isotonic regression. *Advances in Neural Information Processing Systems (NIPS) 30*, pp. 4180–4189, Curran Associates, Inc
- Kotłowski, W. (2016) On minimaxity of follow the leader strategy in the stochastic setting. *Proceeding of the 27th International Conference on Algorithmic Learning Theory (ALT 2016)*, vol. 9925 of *Lecture Notes in Artificial Intelligence*, pp. 261–275, Springer-Verlag
- Dembczyński, K., Kotłowski, W., Waegeman, W., Busa-Fekete, R., and Hüllermeier, E. (2016) Consistency of probabilistic classifier trees. *Machine Learning and Knowledge Discovery in Databases – European Conference, ECML PKDD 2016, Proceedings, Part II*, vol. 9852 of *Lecture Notes in Computer Science*, pp. 511–526, Springer-Verlag
- Kotłowski, W., Koolen, W. M., and Malek, A. (2016) Online isotonic regression. *Proceedings of the 29th International Conference on Learning Theory (COLT '16)*, vol. 49 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 1165–1189
- Kotłowski, W. and Dembczyński, K. (2015) Surrogate regret bounds for generalized classification performance metrics. *Proceedings of The 7th Asian Conference on Machine Learning (ACML '15)*, vol. 45 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 301–316
- van Erven, T., Kotłowski, W., and Warmuth, M. K. (2014) Follow the leader with dropout perturbations. *Proceedings of the 27th International Conference on Learning Theory (COLT '14)*, vol. 35 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 949–974
- Bartlett, P., Grünwald, P., Harremoës, P., Hedayati, F., and Kotłowski, W. (2013) Horizon-independent optimal prediction with log-loss in exponential families. *Proceedings of the 26th International Conference on Learning Theory (COLT '13)*, vol. 30 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 639–661
- Jiazhong, N., Kotłowski, W., and Warmuth, M. K. (2013) Online PCA with optimal regrets. *Proceeding of the 24rd International Conference on Algorithmic Learning Theory (ALT '13)*, Singapore, vol. 8139 of *Lecture Notes in Computer Science*, pp. 98–112, Springer-Verlag
- Dembczyński, K., Jachnik, A., Kotłowski, W., Waegeman, W., and Hüllermeier, E. (2013) Optimizing the F-measure in multi-label classification: Plug-in rule approach versus structured loss minimization. *Proceedings of the 30th International Conference on Machine Learning (ICML '13)*, vol. 28 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 1130–1138
- Warmuth, M., Kotłowski, W., and Zhou, S. (2012) Kernelization of matrix updates, when and how? *Proceeding of the 23rd International Conference on Algorithmic Learning Theory (ALT '12)*, vol. 7568 of *Lecture Notes in Computer Science*, pp. 350–364, Springer-Verlag
- Kotłowski, W., Dembczyński, K., and Hüllermeier, E. (2012) Consistent multilabel ranking through univariate losses. *Proceedings of the 29th International Conference on Machine Learning (ICML '12)*, pp. 1319–1326, Omnipress
- Koolen, W., Kotłowski, W., and Warmuth, M. (2011) Learning eigenvectors for free. *Proceedings of the 25th Annual Conference on Neural Information Processing Systems (NIPS '11)*, pp. 945–953
- Kotłowski, W. and Grünwald, P. (2011) Maximum likelihood vs. sequential normalized maximum likelihood in on-line density estimation. *Proceedings of the 24th International Conference on Learning Theory (COLT '11)*, vol. 19 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 457–476
- Kotłowski, W., Dembczyński, K., and Hüllermeier, E. (2011) Bipartite ranking through minimization of univariate loss. *Proceedings of the 28th International Conference on Machine Learning (ICML '11)*, pp. 1113–1120, Omnipress
- Kotłowski, W. and Warmuth, M. K. (2011) Minimax algorithm for learning rotations (open problem). *Proceedings of the 24th International Conference on Learning Theory (COLT '11)*, vol. 19 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 821–824

- Grünwald, P. D. and Kotłowski, W. (2011) Bounds on individual risk for log-loss predictors (open problem). *Proceedings of the 24th International Conference on Learning Theory (COLT '11)*, vol. 19 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 813–816
- Kotłowski, W., Grünwald, P., and de Rooij, S. (2010) Following the flattened leader. *Proceedings of the 23rd International Conference on Learning Theory (COLT '10)*, pp. 106–118, Omnipress
- Grünwald, P. and Kotłowski, W. (2010) Prequential plug-in codes that achieve optimal redundancy rates even if the model is wrong. *The IEEE International Symposium on Information Theory (ISIT '10)*, pp. 1383–1387, IEEE
- Kotłowski, W. and Słowiński, R. (2009) Rule learning with monotonicity constraints. *Proceedings of the 26th Annual International Conference on Machine Learning, ICML 2009*, pp. 537–544, ACM International Conference Proceeding Series, ACM
- Dembczyński, K., Kotłowski, W., and Słowiński, R. (2008) Maximum likelihood rule ensembles. *Proc. of the 25th International Conference on Machine Learning (ICML '08)*, vol. 307, pp. 224–231, ACM
- Dembczyński, K., Greco, S., Kotłowski, W., and Słowiński, R. (2007) Statistical model for rough set approach to multicriteria classification. *Knowledge Discovery in Databases (ECML/PKDD 2007)*, vol. 4702 of *Lecture Notes in Computer Science*, pp. 164–175, Springer-Verlag

## Journal Publications

- Kotłowski, W. (2018) On minimaxity of follow the leader strategy in the stochastic setting. *Theoretical Computer Science*, **742**, 50–65
- Kotłowski, W. and Dembczyński, K. (2017) Surrogate regret bounds for generalized classification performance metrics. *Machine Learning Journal*, **106**, 549–572
- Jiazhong, N., Kotłowski, W., and Warmuth, M. K. (2016) Online PCA with optimal regret. *Journal of Machine Learning Research*, **17**, 1–49
- Warmuth, M. K., Kotłowski, W., and Zhou, S. (2014) Kernelization of matrix updates, when and how? *Theoretical Computer Science*, **558**, 159–178
- Kotłowski, W. and Słowiński, R. (2013) On nonparametric ordinal classification with monotonicity constraints. *IEEE Transactions on Knowledge and Data Engineering*, **25**, 2576–2589
- Dembczyński, K., Gaweł, P., Jaszkiwicz, A., Kotłowski, W., Kubiak, M., Susmaga, R., Wesołek, P., Wojciechowski, A., and Zielniewicz, P. (2012) Community traffic: a technology for the next generation car navigation. *Control and Cybernetics*, **41**, 869–883
- Guță, M. and Kotłowski, W. (2010) Quantum learning: asymptotically optimal classification of qubit states. *New Journal of Physics*, **12**, 123032
- Dembczyński, K., Kotłowski, W., and Słowiński, R. (2010) ENDER - a statistical framework for boosting decision rules. *Data Mining and Knowledge Discovery*, **21**, 52–90
- Dembczyński, K., Kotłowski, W., and Słowiński, R. (2009) Learning rule ensembles for ordinal classification with monotonicity constraints. *Fundamenta Informaticae*, **94**, 163–178
- Kotłowski, W., Dembczyński, K., Greco, S., and Słowiński, R. (2008) Stochastic dominance-based rough set model for ordinal classification. *Information Sciences*, **178**, 3989–4204
- Dembczyński, K., Kotłowski, W., and Sydow, M. (2008) Effective prediction of web user behaviour with user-level models. *Fundamenta Informaticae*, **89**, 189–206
- Błaszczczyński, J., Dembczyński, K., Kotłowski, W., Słowiński, R., and Szelag, M. (2006) Ensemble of decision rules. *Foundations of Computing and Decision Sciences*, **31**, 221–232

## Publications at Other Conferences and Workshops

- Kotłowski, W., Koolen, W. M., and Malek, A. (2016) Online isotonic regression. *European Conference on Operational Research (EURO)*
- Kotłowski, W. (2015) Minimax strategy for prediction with expert advice under stochastic assumptions. *Learning from Easy Data II Workshop, NIPS 2015*
- Kotłowski, W. (2015) Consistent optimization of AMS by logistic loss minimization. *NIPS 2014 Workshop on High-energy Physics and Machine Learning*, vol. 42 of *Journal of Machine Learning Research Workshop and Conference Proceedings*, pp. 99–108
- Dembczyński, K., Kotłowski, W., Gaweł, P., Szarecki, A., and Jaszkievicz, A. (2013) Matrix factorization for travel time estimation in large traffic networks. *International Conference on Artificial Intelligence and Soft Computing (ICAISC '13)*, vol. 7895 of *Lecture Notes in Computer Science*, pp. 500–510, Springer-Verlag
- Kotłowski, W. and Grünwald, P. (2012) Sequential normalized maximum likelihood in log-loss prediction. *Proceedings of the 2012 IEEE Information Theory Workshop (ITW '12)*, pp. 552–556, IEEE
- Koolen, W., Kotłowski, W., and Warmuth, M. (2012) Learning eigenvectors for free. *The 5th Workshop on Information Theoretic Methods in Science and Engineering (WITMSE '12)*
- Gaweł, P., Dembczyński, K., Kotłowski, W., Kubiak, M., Susmaga, R., Zielniewicz, P., and Jaszkievicz, A. (2012) Community traffic: A technology for the next generation car navigation. Pechenizkiy, M. and Wojciechowski, M. (eds.), *ADBIS Workshop*, vol. 185 of *Advances in Intelligent Systems and Computing*, pp. 339–348, Springer-Verlag
- Dembczyński, K. and Kotłowski, W. (2009) Decision rule-based algorithm for ordinal classification based on rank loss minimization. *Preference Learning, ECML/PKDD Workshop*
- Dembczyński, K. and Kotłowski, W. (2009) Three approaches to ordinal classification. *European Conference on Operational Research (EURO)*
- Dembczyński, K., Kotłowski, W., and Weiss, D. (2009) Adrules: Improving quality of ads. *Beyond Search: Semantic Computing and Internet Economics 2009 Workshop*
- Jaśkowski, W. and Kotłowski, W. (2008) On selecting the best individual in noisy environments. *GECCO '08: Proceedings of the 10th Conference on Genetic and Evolutionary Computation*, pp. 961–968, ACM
- Dembczyński, K., Kotłowski, W., and Słowiński, R. (2008) A general framework for learning an ensemble of decision rules. *From Local Patterns to Global Models, ECML/PKDD Workshop*
- Kotłowski, W. and Słowiński, R. (2008) Statistical approach to ordinal classification with monotonicity constraints. *Preference Learning, ECML/PKDD Workshop*
- Dembczyński, K., Kotłowski, W., and Weiss, D. (2008) Predicting ads' click-through rate with decision rules. *Workshop on Targeting and Ranking for Online Advertising, 17th International World Wide Web Conference*
- Dembczyński, K., Kotłowski, W., and Słowiński, R. (2008) Solving regression by learning an ensemble of decision rules. *International Conference on Artificial Intelligence and Soft Computing, 2008*, vol. 5097 of *Lecture Notes in Artificial Intelligence*, pp. 533–544, Springer-Verlag
- Dembczyński, K., Kotłowski, W., and Słowiński, R. (2008) Ensemble of decision rules for ordinal classification with monotonicity constraints. *Rough Sets and Knowledge Technology 2008*, vol. 5009 of *Lecture Notes in Artificial Intelligence*, pp. 260–267, Springer-Verlag
- Dembczyński, K., Kotłowski, W., and Słowiński, R. (2007) Ordinal classification with decision rules. *Proc. of the 3rd International Workshop on Mining Complex Data, 2007*, Warsaw, Poland, pp. 163–174
- Dembczyński, K., Kotłowski, W., and Sydow, M. (2007) Prediction of web user behaviour with user-level models. *Proc. of the ECML/PKDD 2007 Discovery Challenge*, pp. 9–20
- Dembczyński, K., Greco, S., Kotłowski, W., and Słowiński, R. (2007) Relationship between loss functions and confirmation measures. *Rough Sets, Fuzzy Sets, Data Mining and Granular Computing 2007*, vol. 4482 of *Lecture Notes in Computer Science*, pp. 338–345, Springer-Verlag
- Dembczyński, K., Greco, S., Kotłowski, W., and Słowiński, R. (2007) Optimized generalized decision in dominance-based rough set approach. *Rough Sets and Knowledge Technology 2007*, vol. 4481 of *Lecture Notes in Computer Science*, pp. 118–125, Springer-Verlag

Kotłowski, W., Dembczyński, K., Greco, S., and Słowiński, R. (2007) Statistical framework for dominance-based rough set approach. *The 21th Workshop on Complex Systems Modeling*, Institute for Applied System Analysis (IIASA), Laxenburg, Austria

Dembczyński, K., Greco, S., Kotłowski, W., and Słowiński, R. (2006) Quality of rough approximation in multi-criteria classification problems. *Rough Sets and Current Trends in Computing 2006*, vol. 4259 of *Lecture Notes in Computer Science*, pp. 318–327, Springer-Verlag

Błaszczczyński, J., Dembczyński, K., Kotłowski, W., Słowiński, R., and Szlag, M. (2006) Ensembles of decision rules for solving binary classification problems in the presence of missing values. *Rough Sets and Current Trends in Computing 2006*, vol. 4259 of *Lecture Notes in Computer Science*, pp. 224–234, Springer-Verlag

Dembczyński, K., Kotłowski, W., and Słowiński, R. (2006) Additive preference model with piecewise linear components resulting from dominance-based rough set approximations. *International Conference on Artificial Intelligence and Soft Computing, 2006*, vol. 4029 of *Lecture Notes in Computer Science*, pp. 499–508, Springer-Verlag

Błaszczczyński, J., Dembczyński, K., Kotłowski, W., and Pawłowski, M. (2006) Mining direct marketing data by ensembles of weak learners and rough set methods. *Data Warehousing and Knowledge Discovery 2006*, vol. 4081 of *Lecture Notes in Computer Science*, pp. 218–227, Springer-Verlag

Kotłowski, W., Dembczyński, K., Greco, S., and Słowiński, R. (2006) Measures of monotone relationships using dominance-based rough set approach (DRSA). *The 20th Workshop on Complex Systems Modeling*, Institute for Applied System Analysis, Laxenburg, Austria

## Book Chapters

Dembczyński, K., Kotłowski, W., Słowiński, R., and Szlag, M. (2010) Learning of rule ensembles for multiple attribute ranking problems. Fürnkranz, J. and Hüllermeier, E. (eds.), *Preference Learning*, pp. 217–247, Springer-Verlag

Dembczyński, K., Kotłowski, W., and Słowiński, R. (2010) Beyond sequential covering – boosted decision rules. *Advances in Machine Learning I*, vol. 263 of *Studies in Computational Intelligence*, pp. 209–225, Springer-Verlag

Kotłowski, W., Dembczyński, K., Greco, S., and Słowiński, R. (2008) Stochastic model for dominance-based rough set approach. *Developments in Fuzzy Sets, Intuitionistic Fuzzy Sets, Generalized Nets and Related Topics. Foundations*, vol. I, pp. 191–228, Academic Publishing House EXIT

## Thesis

Kotłowski, W. (2009) *Statistical Approach to Ordinal Classification with Monotonicity Constraints*. Ph.D. dissertation, Poznan University of Technology

## Technical Reports

Dembczyński, K., Gaweł, P., Jaskiewicz, A., Kotłowski, W., and Szarecki, A. (2009) Improving the travel time prediction by using the real-time floating car data. Tech. Rep. RA-06/09, Institute of Computing Science, Poznań University of Technology

Kotłowski, W. (2007) Qualitative models of climate variations impact on crop yields. Tech. Rep. IR-07-034, International Institute of Applied System Analysis (IIASA)