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Appointments

01/2021–present Associate professor
Institute of Computing Science, Poznan University of Technology, Poznań, Poland

03/2012–12/2020 Assistant professor
Institute of Computing Science, Poznan University of Technology, Poznań, Poland

06/2009–02/2012 Postdoctoral researcher
Centrum Wiskunde & Informatica (CWI), Amsterdam, Netherlands

09/2008–05/2009 Research assistant
Institute of Computing Science, Poznan University of Technology

Academic Qualifications

2018 Habilitation degree in Computer Science
Poznan University of Technology

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

2006 M.Sc. in Theoretical Physics
Adam Mickiewicz University, Poznań
Specialization: Quantum optics and quantum information

2004 M.Sc. in Computer Science
Poznan University of Technology
Specialization: Intelligent decision support systems

2002 B.Sc. in Computer Science
Poznan University of Technology

Research Grants and Projects

2022–present Participant in an R&D project awarded by The National Centre for Research and Development (NCBR) in Poland with Łukasiewicz Poznan Institute: *Development of an IT system using AI to identify consumer opinions on product safety and quality*

2020–present Coordinator in the Academy of Innovative Applications of Digital Technologies (AI Tech) project funded by Operational Programme *Digital Poland for 2014-2020*

2021 R&D team leader in a grant awarded by The National Centre for Research and Development (NCBR) in Poland: *Clearsound* (a system for improving the diagnostic process of hearing loss)

2021-2022 Participant in an R&D project awarded by The National Centre for Research and Development (NCBR) with Ice Code Games: *DEMIURG - AI-assisted video game content creation system for top-down view video games*

2019–present Project leader: *Large-scale multi-objective sequential decision making* (Yahoo Research FREP Award, together with Paul Weng)

2018–present Participant together with Poznan Astronomical Observatory: *New asteroid taxonomy as a tool to understand composition of planetary systems*. OPUS grant awarded by National Science Centre (NCN) in Poland

2017–2023 Project leader: *Online learning algorithms for complex prediction problems SONATA BIS* grant awarded by National Science Centre (NCN) in Poland

2018	Participant in an R&D project for TomTom Poland <i>Smart Rebase prediction model</i>
2015–2017	Project leader: <i>Online learning of matrices</i> SONATA grant awarded by National Science Centre (NCN) in Poland
2015	Participant in a R&D project for Allegro (online e-commerce platform)
2013–2014	Project leader: <i>Information theoretic methods in machine learning theory</i> HOMING PLUS grant awarded by the Foundation for Polish Science
2012–2013	Pro-IDEAS research grant for young scientists awarded by the Faculty of Computing at Poznan University of Technology
2013	Participant in an R&D project with Orange Labs <i>Adaptive learning algorithms for natural language processing</i>
2007–2008	Beyond Search grant award sponsored by Microsoft Research and Microsoft adCenter <i>AdRules: Improving Quality of Ads</i> (with K. Dembczyński and D. Weiss)
2009	Participant in a R&D project for NaviExpert (GPS navigation company) <i>Improving the Travel Time Prediction by Using the Real-time Floating Car Data</i>

Scholarships and Awards

2018, 2019	Outstanding reviewer at NeurIPS (top ~ 10% of reviewers)
2017	Medal of the Polish Commission of National Education (for teaching achievements)
2015	Best Paper Award at Asian Conference on Machine Learning (ACML) 2015, Hong Kong <i>Surrogate regret bounds for generalized classification performance metrics</i> (with K. Dembczyński)
2021, 2018, 2017	Award for scientific / teaching achievements granted by Poznan University of
2016, 2014	Technology
2011–2014	Stipend for outstanding young scientists awarded by Polish Ministry of Science and Higher Education
2009	City of Poznań Scholarship for Young Researchers
2007	First place in ECML/PKDD 2007 Discovery Challenge
2005	Young Scientists Summer Program (YSSP) scholarship, Institute for Applied System Analysis (IIASA), Laxenburg, Austria
2004–2005	Polish Ministry of Education scholarship

Selected Publications in Peer-Reviewed Journals

1. Klimczak, H., Oszkiewicz, D., Carry, B., Penttilä, A., Kryszczyńska, A., and Wilawer, E. (2022) Comparison of machine learning algorithms used to classify the asteroids observed by all-sky surveys. *Astronomy & Astrophysics*, **667**, A10
2. Kotłowski, W. (2020) Scale-invariant unconstrained online learning. *Theoretical Computer Science*, **808**, 139–158
3. Klimczak, H., Kotłowski, W., Oszkiewicz, D. A., DeMeo, F., Kryszczyńska, A., Wilawer, E., and Carry, B. (2021) Predicting asteroid types: importance of individual and combined features. *Frontiers in Astronomy and Space Sciences*, **8**
4. Kotłowski, W. (2018) On minimaxity of follow the leader strategy in the stochastic setting. *Theoretical Computer Science*, **742**, 50–65
5. Kotłowski, W. and Dembczyński, K. (2017) Surrogate regret bounds for generalized classification performance metrics. *Machine Learning Journal*, **106**, 549–572
6. Nie, J., Kotłowski, W., and Warmuth, M. K. (2016) Online PCA with optimal regret. *Journal of Machine Learning Research*, **17**, 1–49
7. Warmuth, M. K., Kotłowski, W., and Zhou, S. (2014) Kernelization of matrix updates, when and how? *Theoretical Computer Science*, **558**, 159–178
8. Kotłowski, W. and Słowiński, R. (2013) On nonparametric ordinal classification with monotonicity constraints. *IEEE Transactions on Knowledge and Data Engineering*, **25**, 2576–2589
9. Guță, M. and Kotłowski, W. (2010) Quantum learning: asymptotically optimal classification of qubit states. *New Journal of Physics*, **12**, 123032
10. Dembczyński, K., Kotłowski, W., and Słowiński, R. (2010) ENDER - a statistical framework for boosting decision rules. *Data Mining and Knowledge Discovery*, **21**, 52–90

11. Dembczyński, K., Kotłowski, W., and Słowiński, R. (2009) Learning rule ensembles for ordinal classification with monotonicity constraints. *Fundamenta Informaticae*, **94**, 163–178
12. Kotłowski, W., Dembczyński, K., Greco, S., and Słowiński, R. (2008) Stochastic dominance-based rough set model for ordinal classification. *Information Sciences*, **178**, 3989–4204
13. Dembczyński, K., Kotłowski, W., and Sydow, M. (2008) Effective prediction of web user behaviour with user-level models. *Fundamenta Informaticae*, **89**, 189–206

Selected Publications in Peer-Reviewed Conference Proceedings

1. van Erven, T., Sachs, S., Koolen, W. M., and Kotłowski, W. (2021) Robust online convex optimization in the presence of outliers. *Conference on Learning Theory (COLT)*, vol. 134, pp. 4174–4194
2. Warmuth, M. K., Kotłowski, W., and Amid, E. (2021) A case where a spindly two-layer linear network decisively outperforms any neural network with a fully connected input layer. *Algorithmic Learning Theory (ALT)*, vol. 132, pp. 1214–1236
3. Upadhyay, U., Busa-Fekete, R., Kotłowski, W., Pál, D., and Szörényi, B. (2020) Learning to crawl. *AAAI Conference on Artificial Intelligence*
4. Kempka, M., Kotłowski, W., and Warmuth, M. K. (2019) Adaptive scale-invariant online algorithms for learning linear models. *International Conference on Machine Learning (ICML)*, vol. 97, pp. 3321–3330
5. Kotłowski, W. and Neu, G. (2019) Bandit principal component analysis. *Conference on Learning Theory (COLT)*, vol. 99, pp. 1994–2024
6. van der Hoeven, D., van Erven, T., and Kotłowski, W. (2018) The many faces of exponential weights in online learning. *Conference On Learning Theory (COLT)*, pp. 2067–2092
7. Kotłowski, W., Koolen, W. M., and Malek, A. (2017) Random permutation online isotonic regression. *Advances in Neural Information Processing Systems (NIPS)*, pp. 4180–4189
8. Kotłowski, W. (2017) Scale-invariant unconstrained online learning. *Algorithmic Learning Theory (ALT)*, pp. 412–433
9. Dembczyński, K., Kotłowski, W., Koyejo, O., and Natarajan, N. (2017) Consistency analysis for binary classification revisited. *International Conference on Machine Learning (ICML)*, pp. 961–969
10. Kotłowski, W. (2016) On minimaxity of follow the leader strategy in the stochastic setting. *Algorithmic Learning Theory (ALT)*, pp. 261–275
11. Dembczyński, K., Kotłowski, W., Waegeman, W., Busa-Fekete, R., and Hüllermeier, E. (2016) Consistency of probabilistic classifier trees. *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)*, pp. 511–526
12. Kotłowski, W., Koolen, W. M., and Malek, A. (2016) Online isotonic regression. *Conference on Learning Theory (COLT)*, pp. 1165–1189
13. Kotłowski, W. and Dembczyński, K. (2015) Surrogate regret bounds for generalized classification performance metrics. *Asian Conference on Machine Learning (ACML)*, pp. 301–316
14. van Erven, T., Kotłowski, W., and Warmuth, M. K. (2014) Follow the leader with dropout perturbations. *Conference on Learning Theory (COLT)*, pp. 949–974
15. Bartlett, P., Grünwald, P., Harremoës, P., Hedayati, F., and Kotłowski, W. (2013) Horizon-independent optimal prediction with log-loss in exponential families. *Conference on Learning Theory (COLT)*, pp. 639–661
16. Jiazhong, N., Kotłowski, W., and Warmuth, M. K. (2013) Online PCA with optimal regrets. *Algorithmic Learning Theory (ALT)*, pp. 98–112
17. 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. *International Conference on Machine Learning (ICML)*, pp. 1130–1138
18. Warmuth, M., Kotłowski, W., and Zhou, S. (2012) Kernelization of matrix updates, when and how? *Algorithmic Learning Theory (ALT)*, pp. 350–364
19. Kotłowski, W., Dembczyński, K., and Hüllermeier, E. (2012) Consistent multilabel ranking through univariate losses. *International Conference on Machine Learning (ICML)*, pp. 1319–1326
20. Koolen, W., Kotłowski, W., and Warmuth, M. (2011) Learning eigenvectors for free. *Advances in Neural Information Processing Systems (NIPS)*, pp. 945–953
21. Kotłowski, W. and Grünwald, P. (2011) Maximum likelihood vs. sequential normalized maximum likelihood in on-line density estimation. *Conference on Learning Theory (COLT)*, pp. 457–476

22. Kotłowski, W., Dembczyński, K., and Hüllermeier, E. (2011) Bipartite ranking through minimization of univariate loss. *International Conference on Machine Learning (ICML)*, pp. 1113–1120
23. Kotłowski, W., Grünwald, P., and de Rooij, S. (2010) Following the flattened leader. *Conference on Learning Theory (COLT)*, pp. 106–118
24. Grünwald, P. and Kotłowski, W. (2010) Prequential plug-in codes that achieve optimal redundancy rates even if the model is wrong. *IEEE International Symposium on Information Theory (ISIT)*, pp. 1383–1387
25. Kotłowski, W. and Słowiński, R. (2009) Rule learning with monotonicity constraints. *International Conference on Machine Learning (ICML)*, pp. 537–544
26. Dembczyński, K., Kotłowski, W., and Słowiński, R. (2008) Maximum likelihood rule ensembles. *International Conference on Machine Learning (ICML)*, pp. 224–231
27. Dembczyński, K., Greco, S., Kotłowski, W., and Słowiński, R. (2007) Statistical model for rough set approach to multicriteria classification. *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)*, pp. 164–175

Selected Invited Talks

11/2021	Lund University, Sweden
05/2020	Paderborn University, Germany
11/2019	ML in PL workshop, Warsaw
08/2019	Seminar at Leiden University, the Netherlands
05/2019	Machine learning seminar at ETH Zürich, Switzerland
05/2019, 11/2018	Google Zürich, Switzerland
04/2019	DeepMind London, UK
11/2018	<i>From Multiple Criteria Decision Aid to Preference Learning</i> workshop, Poznań, Poland
02/2018	Universitat Pompeu Fabra, Barcelona, Spain
11/2016	<i>Theoretical Foundations for Learning from Easy Data</i> workshop, Lorentz Center, Leiden, The Netherlands
04/2016	Polish Special Interest Group on Machine Learning, Czestochowa, Poland
11/2014	Lecture series at the Faculty of Mathematics and Information Science, Warsaw University of Technology (with K. Dembczyński)
06/2014	Lecture series at a summer school organized by the Institute of Computer Science of the Polish Academy of Sciences, 2014, Mikołajki, Poland (with K. Dembczyński)
02/2014	<i>Preference Learning</i> seminar, Dagstuhl, Germany

Research Activities

<i>Research visits</i>	University of California, Santa Cruz (2018, 2016, 2015, 2014, 2013, 2012, 2011, 2010) University of Munich (2022) Leiden University, Netherlands (2019) Google Zürich (2019) Universitat Pompeu Fabra, Barcelona (2018, 2020, 2021) Centrum Wiskunde & Informatica, Amsterdam (2015, 2012) Philipps-Universität Marburg, Germany (2014) University of Nottingham, UK (2010) International Institute for Applied System Analysis (IIASA), Laxenburg, Austria (2008)
<i>Local organizer</i>	Workshop on Information Theoretic Methods in Science and Engineering (WITMSE 2012), Centrum Wiskunde & Informatica, Amsterdam. Meeting of the European Working Group in Multiple Criteria Decision Aid (MCDA) 2007, Poznań, Poland
<i>Conference</i>	International Conference on Machine Learning (ICML): 2021, 2019, 2017, 2016, 2012-2014
<i>PC member / reviewer</i>	Neural Information Processing Systems (NeurIPS): 2016-2023, 2014, 2012 Conference on Learning Theory (COLT): 2023, 2022, 2021, 2020, 2015, sub-reviewer: 2016-2019, 2012-2014 Algorithmic Learning Theory (ALT): 2020, 2019, 2018 International Joint Conference on Artificial Intelligence (IJCAI): 2015, 2011 Conference on Uncertainty in Artificial Intelligence (UAI): 2014, 2013, 2012, 2010 Conference on Artificial Intelligence and Statistics (AISTATS): 2016, 2011 Conference on Artificial Intelligence (AAAI): 2012 IEEE International Symposium on Information Theory (ISIT): 2010 European Conference on Machine Learning (ECML) 2008
<i>Journal reviewer</i>	Journal of Machine Learning Research (JMLR) Machine Learning Journal (MLJ) Journal of the American Statistical Association (JASA) Artificial Intelligence Journal (AIJ) IEEE Transactions on Pattern Analysis and Machine Intelligence European Journal of Operational Research (EJOR) Information Sciences (INS) Operational Research – an International Journal (ORIJ) Data Mining and Knowledge Discovery (DAMI) IEEE Transactions on Signal Processing (TSP) IEEE Transactions on Knowledge and Data Engineering (TKDE)

Teaching

2022-2023	<i>Machine Learning Theory</i> , Poznan University of Technology
2021-2023	<i>Elements of Convex Optimization</i> , Poznan University of Technology
2020-2023	<i>Introduction to Probability</i> , Poznan University of Technology
2017-2023	<i>Probabilistic Methods</i> , Poznan University of Technology
2018-19	<i>Continuous Optimization</i> , Poznan University of Technology
2013-19	<i>Calculus and Linear Algebra for Bioinformatics</i> , Poznan University of Technology
2012-18, 2008, 2007	<i>Statistics and Data Analysis</i> , Poznan University of Technology
2012-18, 2008, 2006	<i>Optimization Techniques</i> , Poznan 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> , Poznan University of Technology
2008	<i>Data Warehouses and Data Exploration</i> , Poznan University of Technology
2005	<i>Software Engineering</i> , Poznan University of Technology