CURRICULUM VITAE
Małgorzata Bogdan
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EDUCATION

M.Sc. in Applied Mathematics, June 1992
Wrocław University of Technology, Poland

Ph.D. in Statistics, December 1996
Wrocław University of Technology, Poland
Advisor: T. Ledwina
Dissertation: Data driven versions of smooth tests of goodness-of-fit.

Habilitation in Technical Sciences (Computer Science), October 2009
Institute of Computer Science of the Polish Academy of Sciences, Warsaw, Poland
Topic: Model selection and multiple testing with application for the analysis of genetic data.

EMPLOYMENT

Research and Teaching Assistant, Wrocław University of Technology, 1992–1997
Assistant Professor, Wrocław University of Technology, 1997 – 2011
Associate Professor, Wrocław University of Technology, 2011 - present
Associate Professor, University of Wrocław, 2015 – present

VISITING POSITIONS

Visiting Scholar and Lecturer	University of Washington	01.2000 – 08.2000
Limited Term Lecturer	Purdue University	08.2000 – 12.2000
Visiting Assistant Professor	Purdue University	01.2001 – 12.2001
		01.2004 – 08.2004
		06.2005 – 08.2005
		06.2006 – 08.2006
		01.2007 – 05.2007
		06.2007 – 08.2007
		08.2009 – 01.2010
Visiting Lecturer	Vienna University	03.2006, 12.2008
Fulbright Scholar	Stanford University	08.2012 – 05.2013

Visiting Associate Professor	Stanford University	05.2013 – 08.
Associate Professor	Akademia Jana Długosza	10.2010 – 09.
Member of Presidium of the Mathematical Committee of Polish Academy of Sciences	2012–2016	
Head of the Committee of Applied Mathematics of Polish Academy of Sciences	2016–present.	

AWARDS, HONORS

1988, 1989, 1991 Most popular student-sportsman of the Wrocław University of Technology.

1992 First prize at the Contest of the Polish Mathematical Society for the best student's work on the probability theory and applications of mathematics (for Master's thesis "Asymptotic distributions of linear combinations of order statistics").

1997 Qualification for the Tenth European Young Statisticians Meeting.

1997 Award of the Dean of the Faculty of Fundamental Problems of Technology (Wrocław University of Technology).

1998 Invitation to the Jury of the Contest of the Polish Mathematical Society for the best student's work on the probability theory and applications of mathematics.

1999 Qualification for Seminaries Europeens de Statistiques (SEMSTAT) on Complex Stochastic Systems in Eindhoven.

1999 Scholarship of Austrian Academic Exchange Service for a research visit at the Department of Statistics, Vienna University.

2000 Scholarship of Foundation for Polish Science for a research visit at the Department of Statistics, University of Washington.

2003 Award of the Dean of the Faculty of Fundamental Problems of Technology (Wrocław University of Technology).

2005 Invitation for the workshop "Statistiche und Probabilistiche Methoden der Modellwahl", Oberwolfach

2007, 2008 Women for Math Science Award from the Department of Mathematics, Munich University of Technology

2012-2013 Fulbright scholarship to visit the Department of Statistics at Stanford University.

2012-2020 Elected Member of the Presidium of the Mathematical Committee of the Polish Academy of Sciences.

GRANTS

1992,1994 "Decision methods and their applications", researcher (principal investigator S. Trybuła), Polish Committee for Scientific Research.

1993–1996 "Adaptive statistical procedures", researcher (principal investigator T. Ledwina), Polish Committee for Scientific Research

2003–2004 "Statistical methods in Bioinformatics and Molecular Genetics", principal investigator (with A. Futschik), international cooperation grant of MNiSW and OAD.

2005–2006 "Topics in Biostatistics and Molecular Genetics", principal investigator (with A. Futschik), international cooperation grant of MNiSW and OAD.

2007–2008 "Statistical issues in modeling genetic data", principal investigator (with A. Futschik), international cooperation grant of MNiSw and OAD.

2006–2008 "Adaptive versions of Bayesian Information Criterion for multiple regression", principal investigator, MNiSW.

2009-2010 "Statistical issues in data mining - optimal rules for high dimensional model selection and multiple testing", principal investigator (with F. Frommlet), international cooperation grant of MNiSW and OAD.

2010-2012 "Optimal selection procedures in genome wide association studies (GWAS)", project sponsored by Wiener Wissenschafts-, Forschungs- und Technologiefonds, international partner, PI - Florian Frommlet.

2010-2012 "Model selection criteria and multiple testing in searching through large data bases", principal investigator, MNiSW.

2010-2012 "Bayesian versions of logic regression in application for localizing multiple interacting quantitative trait loci", PhD research project of Magdalena Malina, project director, MNiSW.

2011-2014 "Methods of machine learning for prediction of protein contact sites", researcher (principal investigator M. Kotulska), MNiSW

2013-2016 "Integrated design and analysis of small population group trials", EU FP7 Collaborative Project, Leader of Workpage 8: "Genetic factors influencing the response to the therapy in small population group trials", (project coordinator Prof. Ralf-Dieter Hilgers, Uinversitaetsklinikum Aachen)

PUBLICATIONS
Book

F. Frommlet, M. Bogdan, D. Ramsey, *"Phenotypes and Genotypes: Search for Influential Genes"*, Springer Series in Computational Biology, 2016.

Journal Articles

1. W.Su, M. Bogdan, E.J. Candès, "False Discoveries Occur Early on the Lasso Path, to appear in Annals of Statistics, arxiv: 1511.01957.

2. D. Brzyski, C.B. Peterson, P.Sobczyk, E.J. Candès, M. Bogdan, C. Sabatti, "Controlling the rate of GWAS false discoveries"', Genetics, 2016, doi: 10.1534/genetics.116.193987.

3. S. Lee, D. Brzyski, M. Bogdan, "Fast Saddle-Point Algorithm for Generalized Dantzig Selector and FDR Control with the Ordered l_1-Norm", *Proceedings of the 19th International Conference on Artificial Intelligence and Statistics, JMLR:W and CP* **vol.51**, 780–789, 2016.

4. M. Bogdan, E. van den Berg, C. Sabatti, W. Su, E. J. Candès, "SLOPE – Adaptive Variable Selection via Convex Optimization", *Annals of Applied Statistics*, **9** (3), 1103–1140, 2015.

5. M. Malina, K. Ickstadt, H. Schwender, M. Posch, M. Bogdan, "Detection of epistatic effects with logic regression and a classical linear regression model", *Statistical Applications in Genetics and Molecular Biology*, **13**, 83104, 2014.

6. F. Frommlet, M. Bogdan, "Some optimality properties of FDR controlling rules under sparsity", *Electronic Journal of Statistics*, **7**, 1328–1368, 2013.

7. R. Dutta, M. Bogdan, J. K. Ghosh, "Model selection and multiple testing - A Bayes and empirical Bayes overview and some new results" *Journal of the Indian Statistical Association*, **50**, 105–142, 2012.

8. F. Frommlet, I. Ljubic, H. Arnardottir, M. Bogdan, "QTL Mapping Using a Memetic Algorithm with Modifications of BIC as Fitness Function" *Statistical Applications in Genetics and Molecular Biology*, 11 (4) Art.2, 2012.

9. F. Frommlet, F. Ruhaltinger, P. Twaróg, P., M. Bogdan, "A model selection approach to genome wide association studies", *Computational Statistics and Data Analysis*, **56**, 1038-1051, 2012.

10. P. Szulc, M. Bogdan, "Localizing influential genes with modified versions of Bayesian Information Criterion" *Mathematica Applicanda*, **40**, 3–14, 2012.

11. M. Żak-Szatkowska, M. Bogdan, "Modified versions of Bayesian Information Criterion for sparse Generalized Linear Models", *Computational Statistics and Data Analysis*, 55: 2908-2924, 2011.

12. M. Bogdan, A. Chakrabarti, F. Frommlet, J.K. Ghosh, "Asymptotic Bayes Optimality under sparsity of some multiple testing procedures", *Annals of Statistics*, **39**: 1551–1579, 2011.

13. V. Erhardt, M. Bogdan, C. Czado,"Locating Multiple Interacting Quantitative Trait Loci with the Zero-Inflated Generalized Poisson Regression", *Statistical Applications in Genetics and Molecular Biology*, **Vol 9 : Iss. 1**, Article 26, 2010.

14. J. K. Ghosh, M. Bogdan, T. Samanta "Applied Statistics and the Indianness of Indian Data", *Sankhya, Ser. B*, **70**:1–17, 2008.

15. M. Bogdan, J. K. Ghosh, M.Żak-Szatkowska "Selecting explanatory variables with the modified version of Bayesian Information Criterion", *Quality and Reliability Engineering International*, **24**: 627–641, 2008.

16. M. Bogdan, F. Frommlet, P. Biecek, R. Cheng, J. K. Ghosh, R. W. Doerge " Extending the Modified Bayesian Information Criterion (mBIC) to dense markers and multiple interval mapping", *Biometrics*, **64**: 1162–1169, 2008.

17. M. Bogdan, J. K. Ghosh, S. T. Tokdar "A comparison of the Simes-Benjamini-Hochberg procedure with some Bayesian rules for multiple testing", IMS Collections, **Vol.1**, Beyond Parametrics in Interdisciplinary Research: Fetschrift in Honor of Professor Pranab K. Sen, edited by N. Balakrishnan, Edsel Peña and Mervyn J. Silvapulle, pp. 211–230, 2008, Beachwood Ohio.

18. M. Bogdan, J. K. Ghosh, A. Ochman, S. T. Tokdar " On the Empirical Bayes approach to the problem of multiple testing", *Quality and Reliability Engineering International*, **23**: 727–739, 2007.

19. M. Żak, A. Baierl, M. Bogdan A. Futschik "Locating multiple interacting quantitative trait loci using rank-based model selection", *Genetics*, **176**: 1845–1854, 2007.

20. A. Baierl, A. Futschik, M. Bogdan, P. Biecek "Locating multiple interacting quantitative trait loci using robust model selection", *Computational Statistics and Data Analysis*, **51**: 6423-6434, 2007.

21. F.Frommlet, M. Bogdan, A. Futschik "Power Analysis of Database Search using Multiple Scoring Matrices", *Computational Statistics and Data Analysis*, **51**: 1656–1663, 2006.

22. A. Baierl, M. Bogdan, F. Frommlet and A. Futschik "On Locating Multiple Interacting Quantitative Trait Loci in Intercross Designs", *Genetics*, **173**: 1693-1703, 2006.

23. M. Bogdan and R. W. Doerge "Biased estimators of QTL heritability and location in interval mapping", *Heredity* **95**: 476-484, 2005.

24. M. Bogdan, J. K. Ghosh and R. W. Doerge, "Modifying the Schwarz Bayesian Information Criterion to locate multiple interacting quantitative trait loci", *Genetics* **167**:989–999, 2004.

25. F. Frommlet, A. Futschik and M. Bogdan, "On the significance of sequence alignments when using multiple scoring matrices", *Bioinformatics* **20** (6): 881-887, 2004.

26. F. Frommlet, A. Futschik, M. Bogdan, "Sequence Alignments with Multiple Scoring Matrices." Proceedings of the GCB 03 (German Conference on Bioinformatics), H.W. Mewes, V. Heun, D. Frishman, S. Kramer (eds.), vol. I, 41 – 45, 2003.

27. M.Bogdan, K.Bogdan and A.Futschik, "A data driven smooth test for circular uniformity", *Ann. Inst. Stat. Math.* **54**:29-44, 2002.

28. N. H. Chapman, M. Badzioch, M. Bogdan, E. M. Conlon, E. W. Daw, F. Gagnon, A-L. Leutenegger, N. Li, J. M. Maia, E. M. Wijsman, E. A. Thompson,

"The importance of connections: Joining components of the Hutterite Pedigree", *Genetic Epidemiology* 21(Suppl 1):S230-S235, 2001.

29. M.Bogdan, "Data driven versions of Neyman's test for goodness-of-fit based on Bayesian rule", *J. Statist. Comput. Simul.*, 68(3):203–222, 2001.

30. K. Bogdan, M. Bogdan, "On existence of maximum likelihood estimators in exponential families", *Statistics*, 34: 137–149, 2000.

31. M. Bogdan, "Data driven smooth tests for bivariate normality", *Journal of Multivariate Analysis*, 68: 26–53, 1999.

32. M. Bogdan and T. Ledwina, "Testing uniformity via log–spline modeling" , *Statistics*, 28:131–157, 1996.

33. M. Bogdan, "Data driven versions of Pearson's chi-square test for uniformity", *J. Statist. Comput. Simul.*, 52:217–237, 1995.

34. M. Bogdan, "Asymptotic distributions of linear combinations of order statistics", *Applicationes Mathematicae*, 22:201–225, 1994.

PUBLISHED ABSTRACTS

1. A. W. George, M. Bogdan, E. M. Wijsman, E. A. Thompson, " Markov chain Monte Carlo methods for the calculation of likelihoods in genetic linkage studies", *Am. J. Hum. Genet.* **69**(4): (Suppl. 1) 1337, 2001.

2. M. Bogdan, J.K. Ghosh, R.W. Doerge, P. Biecek, A. Baierl, A. Futschik, F. Frommlet "Modified version of Bayesian Information criterion for localization of multiple interacting quantitative trait loci", *Ann. Hum. Gen.* **69**: 765, 2005.

TECHNICAL REPORTS

1. M. Bogdan and R. W. Doerge "Mapping multiple interacting quantitative trait loci with multidimensional genome searches", Technical Report 04-03, Department of Statistics, Purdue University, 2003.

2. J. Szyda, P. Biecek, F. Frommlet, J. K. Ghosh and M. Bogdan "Analysis of genetic background of quantitative traits related to alcoholism by mixed inheritance and oligogenic models", Technical Report, Wrocław University of Technology, 2005.

3. M. Bogdan, A. Chakrabarti, J.K.Ghosh "Optimal rules for multiple testing and sparse multiple regression", Technical Raport I-18/08/P-003, Institute of Mathematics and Computer Science, Wrocław University of Technology, 2008.

4. M. Bogdan, A. Chakrabarti, J.K.Ghosh "Bayes oracle and the asymptotic optimality of the multiple testing procedures under sparsity, Technical Report 09-02, Department of Statistics, Purdue University, 2009.
second version - M. Bogdan, A. Chakrabarti, F. Frommlet, J.K. Ghosh, "The Bayes oracle and asymptotic optimality of multiple testing procedures under sparsity", arXiv:1002.3501v1, 2010.

5. M. Żak-Szatkowska, M. Bogdan "Applying generalized linear models for identifying important factors in large data bases". Technical Report I-18/2010/P-001, Institute of Mathematics and Computer Science, Wroclaw University of Technology.

6. F. Frommlet, M. Bogdan, A. Chakrabarti, "Asymptotic Bayes optimality under sparsity of selection rules for general priors", arXiv:1005.4753v1, 2010.

7. M. Bogdan, E. van den Berg, W. Su, E.J. Candès, "Statistical estimation and testing via the ordered ℓ_1 norm", arXiv:1310.1969, 2013.

8. D. Brzyski, A. Gossmann, W.Su, M. Bogdan, "Group SLOPE - adaptive selection of groups of predictors", arXiv: 1610.04960, 2016.

9. P. Szulc, M. Bogdan, F. Frommlet, H. Tang, " Joint Genotype- and Ancestry-based Genome-wide Association Studies in Admixed Populations", biorxiv, doi: http://dx.doi.org/10.1101/062554, 2016.

10. P. Sobczyk, M. Bogdan, J. Josse, "Bayesian dimensionality reduction with PCA using penalized semi-integrated likelihood", arxiv: 1606.05333, 2016.

EDITORIAL WORK

- Member of the Editorial Board of *Scientific Reports*: 2012-2016

- Member of the Editorial Board of *Statistics*: 2012-present

- Member of the Editorial Board of *Computational Statistics and Data Analysis*:2016

- Statistics expert for *The Plant Cell* : 2008 – 2013

Reviewer for:

Annals of Statistics, Journal of Time Series Analysis, Electronic Journal of Statistics, Scandinavian Journal of Statistics, Genetics, Bioinformatics, Briefings in Bioinformatics, Statistical Applications in Genetics and Molecular Biology, Human Heredity, Heredity, Journal of the Royal Statistical Society Ser.B, BMC Bioinformatics, BMC Health Services, Computational Statistics and Data Analysis, Mathematics and Computers in Simulation, Biostatistics, Journal of Agricultural, Biological and Environmental Statistics, Sankhya, Statistica Sinica, IEEE Transactions on Signal Processing, Biometrical Journal, Statistical Methodology, Statistics and Decisions, Journal of Statistical Planning and Inference, Journal of Multivariate Analysis, PLoS One

Book reviewer for Chapman & Hall/CRC.

PROFESSIONAL ACTIVITIES

1. Elected Representative of the Junior Faculty in the Council of the Faculty of Fundamental Problems of Technology, Wrocław University of Technology, 2004-2008.

2. Proxy for the President of the Wrocław University of Technology in the "GENOMIS" scientific network, 2008 -2009.

3. Reviewer for the Foundation for Polish Science, 2008.

4. Reviewer for the National Center of Science, 2012.

5. Expert of the National Center of Science, 2013–2015.

6. Member of the Presidium of the Mathematical Committee of the Polish Academy of Sciences, 2012-2015.

7. Polish representative in the Managing Committee of the COST action CRoNOS (Computationally-intensive methods for the Robust aNalysis Of non-Standard Data), 2015–2018.

8. Head of the Committee of Applied Mathematics of Polish Academy of Sciences 2016–present.

TEACHING

Advising

Diploma work, BSc in Mathematical Informatics

2007 Katarzyna Olejnik, "Locating quantitative trait loci - interface for existing software".

Master Theses, MSc in Applied Mathematics

1999 Monika Horobiowska, "New data driven versions of the smooth test for bivariate normality".

1999 Adam Kaczmarz, "Data driven versions of the smooth tests for multivariate normality".

2004 Marek Szatkowski, "Statistical properties of interval mapping of quantitative trait loci".

2004 Konrad Karpowicz, "Bias of the estimates of QTL heritability".

2004 Łukasz Dobosz, "Rao score tests in application for testing goodness-of-fit".

2006 Aleksandra Ochman, "Statistical issues in multiple testing".

2006 Łukasz Wolski, "Bayesian methods of locating quantitative trait loci".

2006 Małgorzata Biernat "Permutation tests and Bayesian Information Criterion in application for localizing QTL".

2007 Magdalena Grynienko "Statistical methods for testing hypotheses of population genetics".

2008 Paweł Pęcherzewski, "Identifying factors influencing binary traits".

2008 Łukasz Wierzbicki, "Model selection in multivariate regression".

2010 Agata Zawadzka, "Bayesian methods of localization of genes influencing discrete traits".

2010 Małgorzata Wiśniewska, "Bayesian methods of localization of genes influencing binary traits".

2010 Marta Mrozek, "Bayesian version of interval mapping"

2010 Piotr Szulc, "Statistical criteria for the choice of the model for substitutions in DNA sequences".

2011 Roksana Kowalska, "Cluster analysis and its application for the recognition of protein structures".

2011 Adam Leśniewski, "Regularization methods for the choice of explanatory variables in a sparse regression with application for genetic data"

2012 Daniel Lazar, "Sparse canonical correlation analysis".

2012 Rafał Baranowski, "Sparse principal component analysis"'.

2014 Agnieszka Rackiewicz, "Subspace clustering"

2015 Jan Idziak, "Analysis of graphical models"

2015 Marta Karaś, "Change point identification"

2015 Grzegorz Kotkowski, "Random matrix theory in multivariate statistics"

2015 Estera Nocoń, "'Statistical methods for analysing and assessing reliability of open source software"

2016 Dorian Turkiewicz, "Rank version of SLOPE"'

PhD advising

Advisor for

1. Małgorzata Żak-Szatkowska, "Model selection criteria for large data bases".

2. Magdalena Malina, "Logic regression - theoretical properties and applications in statistical genetics", defended in September 2012.

3. Piotr Szulc

4. Damian Brzyski, "Selecting relevant groups of explanatory variables with the False Discovery Rate control" , defended in April 2016.

5. Piotr Sobczyk

6. Michał Kos

Member of PhD Committee of Tilman Achberger, defended in March 2011, Purdue University.

Courses taught at Wrocław University of Technology, University of Wrocław, Jan Długosz University, Purdue University, University of Washington and Vienna University:

1. Linear Algebra.

2. Mathematical Analysis.

3. Introduction to the Probability and Statistics.

4. Statistical Methods for Biology.

5. Nonparametric Statistics.

6. Estimation Theory.

7. Theory of Testing.

8. Statistical Packages.

9. Analysis of Time Series.

10. Stochastic Modeling.

11. Applied Regression Analysis.

12. Statistical Genetics.

13. Curve estimation.

14. Applied Statistics.

15. Statistical Data Analysis.

16. Theoretical Foundations of the Analysis of Large Data Sets.

17. Advanced Methods of Statistical Learning.

SPORT ACHIEVEMENTS

- Polish champion in Children's Swimming : 1976 (25m butterfly), 1977 (50m butterfly)

- Polish champion in Junior Rowing (quadruple scull): 1984, 1985

- Champion of the Polish Universities of Technology in Swimming: 1986, 1988, 1990

- Member of the Polish National Team of Lifeguards: 1987

- Polish Champion in Masters Swimming: 2011 (200 m butterfly and 200 m backstroke)

FAMILY

Husband: Krzysztof. Children: Michał (1991), Joanna (1992), Artur (1995).