Michal Marczyk, PhD
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Curriculum vitae

Education

- 2003 – 2008 – Silesian University of Technology, Faculty of Automatic Control, Electronics and Computer Science: MSc on Information Processing for Control. Master Thesis: 'Peak alignment in protein spectra'
- 2008 – 2009 – Silesian University of Technology, Interdisciplinary PhD Studies: Bioinformatics
- 2008 – 2013 – Silesian University of Technology, Faculty of Automatic Control: PhD studies on Automatic Control and Robotics
- 2012 – 2013 – Silesian University of Technology, Faculty of Automatic Control: PhD studies on Biocybernetics and Biomedical Engineering. PhD Thesis: 'Processing and classification of data obtained with the use of high throughput molecular biology techniques'

Academic career

- 05.2013 – 12.2013 – young specialist, Clinic of Thoracic Surgery, Medical University of Gdansk
- 10.2013 – 09.2014 – research assistant, Data Mining group, Institute of Automatic Control, Silesian University of Technology
- From 10.2014 – assistant professor, Data Mining group, Institute of Automatic Control, Silesian University of Technology
- From 12.2017 – associate research scientist, Yale Cancer Center, Yale University School of Medicine

Scientific interests

- Biostatistics, data mining, machine learning and their application in biological data analysis
- Algorithms for pre-processing of high-throughput biological data (DNA microarrays, qRT-PCR arrays, mass spectrometry, next generation sequencing)
- Analysis of 2D gel electrophoresis images
- Gaussian mixture modeling of 1D and 2D biological signals

Number of publications: 88 (15 IF journal papers, 15 book chapters, 58 conferences)
Software: https://github.com/ZAEDPolSl

Top 10 publications

- **Marczyk M**: *Mixture modeling of 2D gel electrophoresis spots enhances the performance of spot detection*. IEEE Transactions on Nanobioscience 2017, 16(2): 91-99
- Zyla J, **Marczyk M**, Weiner J, Polanska J: *Ranking metrics in Gene Set Enrichment Analysis: do they matter?* BMC Bioinformatics 2017, 18(1): 256
- Widlak P, Pietrowska M, Polanska J, **Marczyk M**, Ros M, Dziadziuszko R, Jassem J, Rzyman W: *Serum mass profile signature as a biomarker of early lung cancer*. Lung Cancer 2016, 99: 46-52
- Bobowicz M, Skrzypski M, Czapiewski P, **Marczyk M**, Maciejewska A, Jankowski M, Szulgo-Paczkowska A, Zegarski W, Pawlowski R, Polanska J, Biernat W, Jaskiewicz J, Jassem J: *Prognostic value of 5-microRNA based signature in T2-T3N0 colon cancer*. Clinical & Experimental Metastasis 2016,33(8): 765-773
- **Marczyk M**, Drazek G, Pietrowska M, Widlak P, Polanska J, Polanski A: *Modeling of Imaging Mass Spectrometry Data and Testing by Permutation for Biomarkers Discovery in Tissues*. Procedia Computer Science 2015, 51: 693-702
- Polanski A, **Marczyk M**, Pietrowska M, Widlak P, Polanska J: *Signal Partitioning Algorithm for Highly Efficient Gaussian Mixture Modeling in Mass Spectrometry*. PLOS ONE 2015, 10(7): e0134256
- Jaksik R, **Marczyk M**, Polanska J, Rzeszowska-Wolny J: *Sources of High Variance between Probe Signals in Affymetrix Short Oligonucleotide Microarrays.* Sensors 2014, 14(1), p. 532-48
- **Marczyk M**, Krol L, Polanska J: *Automatic detection of outlying microarrays using multiarray quality metrics*. Proceedings of International Work-Conference on Bioinformatics and Biomedical Engineering, vol.1, p. 738-46
- **Marczyk M**, Jaksik R, Polanski A, Polanska J: *Adaptive filtering of microarray gene expression data based on Gaussian mixture decomposition*. BMC Bioinformatics 2013, 14(1): 101
- **Marczyk M**, Jaksik R, Polański A, Polańska J: *Affymetrix Chip Definition Files Construction Based on Custom Probe Set Annotation Database*. In Semantic Methods for Knowledge Management and Communication, Katarzyniak R, Chiu T-F, Hong C-F, Nguyen N, editors. Springer Berlin / Heidelberg 2011, p. 135-44

Projects

- 2016-2019: "*Bioinformatics tools for automated detection of tumor and its heterogeneity based on cancer metabolome profiling with imaging mass spectrometry*", National Centre of Science, 2015/19/B/ST6/01736, Co-investigator, PI: prof. Joanna Polanska
- 2015-2018: "*MOLTEST BIS – validation of molecular signatures for early detection of lung cancer in a high-risk population*", National Centre for Research and Development, PBS3/A7/29/2015/ID-247184, Co-investigator, PI: prof. Witold Rzyman, MD

- 2015-2017: "*Remote platform for hypothesis testing and analysis of biomedical data*", National Centre for Research and Development, PBS3lB3l32/2075, Co-investigator, PI: prof. Andrzej Swierniak
- 2013-2016: "*Bioinformatics methods for integration of high-throughput biological data for radiosensitivity analysis*", National Centre of Science, 2013/08/M/ST6/00924, Co-investigator, PI: prof. Joanna Polanska
- 2013-2015: "*GCONiI. Upper Silesian Centre for Computational Science and Engineering*", National Centre for Research and Development, POIG.02.03.01-24-099/13, Co-investigator, PI: prof. Joanna Polanska
- 2012-2015: "*MiRNA expression profile as a risk factor of colon cancer recurrence in stage pT2-4N0*", National Centre of Science, 2011/03/B/NZ5/00519, Co-investigator, PI: Marcin Skrzypski, MD PhD
- 2011–2013: "*Analysis of protein mass profiles obtained by MALDI-ToF mass spectrometry to discover signatures of cancer*", National Centre of Science, 2011/01/N/NZ2/04813, Principal Investigator
- 2009-2013: "*MOLTEST 2013. Development of Molecular Tests Aiding the Early Detection of Lung Cancer*", National Centre for Research and Development, POIG.01.01.02-20-080/09, Co-investigator, PI: prof. Witold Rzyman, MD
- 2008–2011: "*GENEPI low-RT, Genetic pathways for the prediction of the effects of ionising radiation: Low dose radiosensitivity and risk to normal tissue after radiotherapy*", Euratom, FP6-036452, Co-investigator, PI: prof. Peter O'Neill

Teaching

- Courses in English: Probability and Statistics (undergraduate; lectures and laboratories), Optimization and Decision Making (undergraduate; laboratories)
- Courses in Polish: Biostatistics (undergraduate; laboratories), Modeling of Biosystems (undergraduate; laboratories), Statistical Inference (postgraduate; laboratories), Optimization Methods (postgraduate; laboratories), Probability and Statistics (undergraduate; laboratories), Computer programming (undergraduate; laboratories), Applied mathematics (postgraduate; lecture and laboratories).

Reviewer

- BMC Bioinformatics (2017)
- Computers in Biology and Medicine (2017)
- Radiation and Environmental Biophysics (2014-2017)
- PeerJ (2016)
- Bulletin of Polish Academy of Sciences (2014)

International mobility experience

- 2017 – teaching at Brest State University supported by Erasmus+ program, Brest, Belarus, 4 – 10 June

- 2017 – invited speaker for seminar "Methods in Bioinformatics and Statistics" in Max Planck Institute for Infection Biology, Berlin, Germany, 28 – 29 March
- 2013 – student's practice granted from ERASMUS program at Department of Molecular Biosciences, The Wenner-Gren Institute of Stockholm University, Stockholm, Sweden, 6 May – 5 August
- 2012 – short course on low-dose radiation biology (CELOD) at Stockholm University, Stockholm, Sweden, 16 – 27 April
- 2009 – visiting scholar at Mathematical Sciences Department, Chalmers University of Technology, Gothenburg, Sweden, 27 April – 18 May

The most relevant conferences

- 11th International Conference on Practical Applications of Computational Biology & Bioinformatics (PACBB 2017), Porto, Portugal – oral presentation
- 12th International Symposium on Bioinformatics Research and Applications (ISBRA 2016), Minsk, Belarus – oral presentation
- International Work-Conference on Bioinformatics and Biomedical Engineering (IWBBIO 2015), Granada, Spain – oral presentation
- 19th Annual International Conference on Research in Computational Molecular Biology (RECOMB 2015), Warsaw, Poland – poster
- 21st Annual International Conference on Intelligent Systems for Molecular Biology and 12th European Conference on Computational Biology (ISMB/ECCB 2013), Berlin, July 21-23, 2013 – poster

Scholarships

- 2012 – 2013 – DoktoRIS – scholarship program for innovative Silesia under the European Union Human Capital Operational Program
- 2009 – 2013 – scholarship for the best PhD students from Silesian University of Technology
- 2008 – 2012 – PhD students scholarship from Silesian University of Technology

Skills

- diligence, conscientiousness, responsibility, team - work
- knowledge of molecular biology, genomics and proteomics
- very good knowledge of biostatistics, bioinformatics and machine learning
- very good knowledge of MATLAB environment and R programming language, knowledge of C/C++, shell scripting, UNIX