

Małgorzata Plechawska-Wójcik

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Research Interests

Bioinformatics, mass spectra analysis, data mining and classification methods.

Software engineering and development, knowledge management systems, project management methods.

Education

2006-2011 – Ph.D. in Computer Science/Data exploration. Silesian University of Technology, Faculty Of Automatic Control, Electronics and Computer Science, Institute of Computer Science, Poland.
Thesis: “Analysis of MALDI-ToF mass spectra using Gaussian Mixture Models”.

2007-2008 – Postgraduate studies in Computer Graphics, Maria Curie-Skłodowska University, Poland.

2001-2006 – MSc in Computer Science/Software Engineering. Lublin University of Technology, Poland.

Work Experience

- 10/2006-Present – Assistant at the Institute of Computer Science, Lublin University of Technology.
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Leadership and organizing activities

- Organizing Intelligent Information and Electronic Technology Conference (IET 2009)
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Academic Experience

Research and educational projects

- High-Flyer Graduate (“Absolwentnamiaręczasu”) – project of establishing new degree courses in Computer Science.
- MDE Expertise - Exchanging knowledge, techniques and experiences around Model Driven Engineering education. Project of Leonardo Da Vinci programme.
- Expert opinion on the innovative aspect of the project submitted by 3W-Studio (RPOWL 2007-2013) – Investment grants for micro-enterprises; Development of labour-consumption estimation method of software development.
- Expert opinion on the analysis of user interfaces quality in POS (Point of Sales) systems.
- Co-working in creating of two Tempus IV projects - TSECAR (Teaching Software Engineering in Central Asia and Russia) oraz ProMEN (Project Management Excellence Network in Kyrgyzstan)

Research activities

- Bioinformatics: proteomic analysis of MALDI-TOF spectra using mixtures of normal distributions; developing of 3-modules software of spectrometry data; decomposition of spectra using Gaussian Mixture Models and Expectation-Maximization algorithm; supervised classification of MS data and dimension reduction; biological databases
- Software development: usability of user interfaces, review and analysis of available methods, identification the characteristics of properly design interfaces; analysis of POS interfaces; Global Collaborative Knowledge Systems, quality of knowledge determination, development of GCKS structure and schema
- Project management: project labour cost estimation; matching method for needs of the organization; analysis of software development process in the organisation

Teaching

- Implementation and maintenance of computer systems
- Team IT projects
- Database languages
- Multimedia databases
- Data integration and exploration
- Database systems on the Internet
- Object-oriented software engineering
- Internet software engineering
- Multimedia software engineering
- Software engineering
- C programming
- C++ programming
- Matlab programming

Courses and training

- „Internet Applications” - Microsoft ITAcademy
- “Cryptographic tokens in physical and logical IT data security” – SMI conference
- „Data warehouses” - Microsoft ITAcademy
- “Corel – graphical techniques” – ZETO Lublin
- “Marketing research service” - Trinity Management
- TOEIC Certificate (770)
- “Program agents, agent systems and applications” – SMI conference
- “Interpersonal communication in the knowledge sharing process” workshops – Lublin University of Technology
- ECDL examiner course
- Microsoft administration courses (series of 6 courses) – MCP (Microsoft Certified Profesional) certificate
- CISCO course and Cisco Certified Network Associate (CCNA) certificate
- “DB2 database” – IBM training

Publications

Books (Author/Editor)

1. ...

Chapters in books:

2. M. Plechawska-Wojcik: A comprehensive analysis of MALDI-TOF spectrometry data, in S. Mordechai, R. Sahu (Eds.). Medical Informatics – in printing, Intech 2011.
3. Plechawska-Wójcik, M.: Application of MALDI-TOF mass spectra processing and classification. ICT-from Theory to Practice, PTI, Lublin 2010, pp.175-192.
4. Plechawska M.: Application of Mass Spectra Analysis based on Gaussian Mixture decomposition and biological knowledge bases. Methods of Optimisation and Data Analysis, K.Nermend, T.Komorowski (Eds.). University of Szczecin Faculty of Economics and Management. 2010, pp.113-126.
5. Plechawska-Wójcik M.: Innowacyjny system wymiany wiedzy z pracodawcami jako element ustawicznej edukacji studentów. Projekt Absolwent na Miarę Czasów. Artykuł w druku.
6. Miłosz M., Muryjas P., Plechawska M.: Systemy informatyczne w obsłudze sprzedaży. Informatyka gospodarcza, Wydawnictwo C.H.Beck, pp.413-427, Warszawa 2010.
7. M.Plechawska, J.Polańska, A.Polański, M.Pietrowska, R.Tarnawski, P.Widlak, M.Stobiecki, Ł.Marczak: Analyze of Maldi-TOF proteomic spectra with usage of mixture of Gaussiandis-tributions.

- Man-Machine Interactions, K.Cyran (Ed.), series: "Advances in Intelligent and Soft Computing", vol.59, 2009, Springer Berlin / Heidelberg, pp.113-120, October 2009.
8. Plechawska M, Polanska J: Simulation of the usage of Gaussian mixture models for the purpose of modelling virtual mass spectrometry data. In Medical Informatics in a United and Healthy Europe - Proceedings of MIE 2009 – The XXII International Congress of the European Federation for Medical Informatics, Eds. KP Adlassnig, B Blobel, J Mantas, I Masic, series: "Studies in Health Technology and Informatics" vol.150:804-8, IOS Press 2009 ISBN 978-1-60750-044-5.
 9. Miłosz M., Muryjas P., Borys M., Plechawska M.: ATSEE: the Authoring Tool for Software Project Effort Estimator Based on Function Points Method. *Variainformatica* 2009, Miłosz M., Muryjas P. (Eds). PIPS, Lublin 2009, pp.185-210.
 10. Plechawska M.: Using likelihood ratio test statistics for comparing mixtures of Gaussian dis-tributions. *Variainformatica* 2009, Miłosz M., Muryjas P. (Eds). PIPS, Lublin 2009, pp.123-132.
 11. Miłosz M., Plechawska M.: Trendy rozwojowe organizacji inteligentnych w globalnej gospo-darce. Zarządzanie przedsiębiorstwem w otoczeniu biznesowym. W. Sitko (Ed.), pp.45-68, Wyd. System Graf ARW Lublin, 2009.
 12. Plechawska M.: Techniki odkrywania wiedzy z danych. *Informatyka stosowana – implementa-cja*, Miłosz M., Muryjas P. (Eds). Polskie Towarzystwo Informatyczne, Kraków, 2007, pp. 49-60.
 13. Miłosz M., Plechawska M., Wójcik Ł.: Systemy informatyczne zarządzania wiedzą. Systemy Informatyczne Zarządzania – od teorii do praktyki. Miłosz M. (Ed.). Wydawnictwo Naukowe PWN. Warszawa, 2006, pp. 151-174.
 14. Plechawska M., Wójcik Ł., Miłosz M.: Algorytmy porównywania ciągów znaków. *Varia In-formatica*. Algorytmy i programy. Redakcja: Stanisław Grzegórski, Marek Miłosz, Piotr Mu-ryjas. PTI, Lublin, 2006, pp. 55-68
 15. Plechawska M., Wójcik Ł., Przyłudzki S.: Wybrane modele ruchu sieciowego. *Varia Informa-tica*. Technologie i bezpieczeństwo. Redakcja: Marek Miłosz, Piotr Muryjas. PTI, Lublin, 2006, ISBN 978-83-922646-5-1, str. 123-134
 16. Plechawska M., Wójcik Ł., Miłosz M.: Praktyczne zastosowanie algorytmów porównywania ciągów znaków. *Varia Informatica*. Algorytmy i programy. Redakcja: Stanisław Grzegórski, Marek Miłosz, Piotr Muryjas. PTI, Lublin, 2006, ISBN 978.

Journal papers:

17. Polanska J, Plechawska M, Pietrowska M, Marczak L: Gaussian Mixture decomposition in the analysis of MALDI-ToF spectra, *Expert Systems*, doi: 10.1111/j.1468-0394. 2011. 00582.x, 2011 Impact Factor 1.230 (2009)
18. Plechawska M.: Simultaneous analysis of multiple Maldi-TOF proteomic spectra using the mean spectra. *Polish Journal of Environmental Studies*. wyd. Hard Olsztyn. Vol.18, No. 3B, 2009, pp.294-298. ISSN 1230-1485 Impact Factor 0.543 (2009)
19. Plechawska M.: Comparing and similarity determining of Gaussian distributions mixtures. *Polish Journal of Environmental Studies*. wyd. Hard Olsztyn. Vol.17, No. 3B, 2008, pp.341-346. ISSN 1230-1485. (2009)
20. Plechawska M., Miłosz M.: Global collaborative knowledge system. *Polish Journal of Envi-ronmental Studies*. wyd. Hard Olsztyn. Vol.16, No. 4A, 2007, pp.232-235. Impact Factor 0.543 (2009) ISSN 1230-1485

Other referred conference and workshop paper:

21. Plechawska-Wójcik M.: Biological interpretation of the most informative peaks in the task of mass spectrometry data classification. *Studia Informatica. Zeszyty Naukowe Politechniki Śląskiej, seria INFORMATYKA*. Vol.32, 2A (96). WydawnictwoPolitechnikiŚląskiej, 2011, pp. 213-228.
22. Plechawska-Wójcik M.: Comprehensive analysis of mass spectrometry data – a case study. *Contemporary Economics*. Univeristy of Finanse and Management in Warsaw. 2011. Artykuł w druku.
23. Plechawska M.: Application of gaussian mixture model and proteomic databases in the mass spectra analysis – architecture of software of comprehensive mass spectrometry data processing. *Studia Informatica. Zeszyty Naukowe Politechniki Śląskiej*, 2010, seria INFORMATYKA, Vol. 31, Number 2A (89), pp. 289-302.

24. Plechawska M.: Classification of Maldi-Tof mass spectrometry data in the analysis of cancer patients. *Artificial Intelligence (3)*. National Academy of Sciences of Ukraine Institute of Artificial Intelligence of the NAS nad MES of Ukraine. 2010, pp.45-52.
25. Plechawska-Wójcik, M.: Application of Expectation-Maximization algorithm and Maximum Likelihood Rule to estimation of mixture models parameters. *Actual Problems of Economics*. Kiev 2010, pp.346-353.
26. Plechawska M., Polański A., Wójcik Ł.: Numerical analysis of EM estimation of mixture models parameters. *Journal AnnalesUmcs, Informatica*, Volume 9, Number 1 / 2009 pp.123-134, DOI 10.2478/v10065-009-0009-9.
27. Miłosz M., Plechawska M.: Bad knowledge elimination methods in GCKS. V Kongres PolskiegoStowarzyszeniaZarządzaniaWiedzą. *Studies & Proceedings of Polish Association for Knowledge Management*, vol. 10. Bydgoszcz 2008, str. 69-75.
28. Plechawska M., Polańska J., Polański A., Pietrowska M., Tarnawski R., Widłak P., Stobiecki M., Marczak Ł.: Application of the gaussian mixture model and the mean spectrum to pro-teomic MALDI-ToF mass spectra analysis. *Proceedings of the Fifteenth National Conference on Application of Mathematics to Biology and Medicine*, Szczyrk, 2009, pp.82-88. Silesian University of Technology, Gliwice.
29. Plechawska M.: Modelling of biological processes with usage of Gaussian distributions mix-tures. *Bioinformatics*. Warszawa 2008. (poster).
30. Plechawska M.: Using mixtures of Gaussian distributions for proteomic spectra analysis. *Międzynarodowewarsztatydoktoranckie, OWD 2008*, pp. 531-536.
31. Polańska J., Plechawska M.: Comparison of convergence criterions used in Expectation-Maximization algorithm. *IX International Conference Proceedings, Symbiosis, KamieńŚląski, 2008*, pp. 49-52.
32. Miłosz M., Plechawska M.: Bad knowledge elimination methods in GCKS. V Kongres PolskiegoStowarzyszeniaZarządzaniaWiedzą. *Studies & Proceedings of Polish Association for Knowledge Management*, vol. 10. Bydgoszcz 2008, pp. 69-75.
33. Plechawska M., Miłosz M.: World Wide Collaborative Knowledge Systems – Wikipedia Project Case Study. *Information Management*, Gdansk University Press, Gdańsk 2007, pp. 352-362.
34. Miłosz M., Plechawska M.: Functionality model of global collaborative knowledge systems. *InformacijosMokslai (Information Sciences)*, vol. 42-43. Vilnius University Publishing House, Wilno 2007, pp. 98-102.
35. Miłosz M., Plechawska M., Wójcik Ł.: Systemy informatyczne zarządzania wiedza. Miłosz M. (Ed.), *Systemy informatyczne zarządzania – od teorii do praktyki*. PWN, Warszawa 2006, pp. 151-174.
36. Miłosz M., Plechawska M., Wójcik Ł.: Algorytmy porównywania ciągów znaków. Grzegórski S., Miłosz M., Muryjas P. (Eds.), *Varia informatica – algorytmy i programy*. PTI, Lublin 2006, str. 55-68.
37. Miłosz M., Plechawska M., Wójcik Ł.: Metody deduplikacji rekordów. Grzegórski S., Miłosz M., Muryjas P. (Eds.), *Varia informatica – algorytmy i programy*. PTI, Lublin 2006.
38. Miłosz M., Plechawska M., Wójcik Ł.: Praktyczne zastosowanie algorytmów porównywania ciągów znaków. Grzegórski S., Miłosz M., Muryjas P. (Eds.), *Varia informatica – algorytmy i programy*. PTI, Lublin 2006.
39. Plechawska M., Wójcik Ł., Przyłucki S.: Wybrane modele ruchu sieciowego. red. Miłosz M., Muryjas P.: *Varia informatica – technologie i bezpieczeństwo*. PTI, Lublin 2006, pp. 123-134.