



# ACADEMIC TEACHER PROFESSIONAL EXPERIENCE

## DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

### 1. Basic information

Name, surname:	Agnieszka Wylomanska
Grade / Title:	PhD, DSc, Professor WUST
Scientific discipline	<b>matematyka / mathematics</b>
Faculty:	W13 Wydział Matematyki / Faculty of Pure and Applied Mathematics
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Link to home page and/or research profiles (Google Scholar, ResearchGate, etc.)	<a href="http://prac.im.pwr.edu.pl/~wyloman/">http://prac.im.pwr.edu.pl/~wyloman/</a> , <a href="https://scholar.google.com/citations?user=KZvYNncAAAAJ&amp;hl=pl&amp;oi=sra">https://scholar.google.com/citations?user=KZvYNncAAAAJ&amp;hl=pl&amp;oi=sra</a>

### 2. Publication record

*Up to 10 most important papers published over the period of previous 10 years.*

No.	Description (authors, publication title, journal / conference, DOI)	Publication year
1.	K. Maraj-Zygmąt, W. Żuławiński, T. Barszcz, R. Zimroz, A. Wylomańska: <a href="#">Threshold lines identification for non-Gaussian distributed diagnostic features</a> , Measurement 221(15), 113495	2023
2.	M. Gabor, R. Zdunek, R. Zimroz, A. Wylomańska: <a href="#">Bearing damage detection with orthogonal and non-negative low-rank feature extraction</a> , IEEE Transactions on Industrial Informatics, doi: 10.1109/TII.2023.3300455	2023
3.	K. Maraj-Zygmąt, A. Grzesiek, G. Sikora, J. Gajda, A. Wylomańska: <a href="#">Testing of two-dimensional Gaussian processes by sample cross-covariance function</a> , Chaos 33, 073135	2023
4.	D. Szarek, I. Jabłoński, R. Zimroz, A. Wylomańska: <a href="#">Non-Gaussian feature distribution forecasting based on ConvLSTM neural network and its application to robust machine condition prognosis</a> , Expert Systems with Applications 230(15), 120588	2023
5.	K. Skowronek, T. Barszcz, J. Antoni, R. Zimroz, A. Wylomańska: <a href="#">Assessment of background noise properties in time and time-frequency domains in the context of vibration-based local damage detection in real environment</a> , Mechanical Systems and Signal Processing 199(15), 110465	2023
6.	W. Żuławiński, A. Grzesiek, R. Zimroz, A. Wylomańska: <a href="#">Identification and validation of periodic autoregressive model with additive noise: finite-variance case</a> , Journal of Computational and Applied Mathematics 427, 115131	2023
7.	K. Maraj-Zygmąt, G. Sikora, M. Pitera, A. Wylomańska: <a href="#">Goodness-of-fit test for stochastic processes using even empirical moments statistic</a> , Chaos 33, 013128	2023
8.	W. Żuławiński, K. Maraj-Zygmąt, H. Shiri, R. Zimroz, A. Wylomańska: <a href="#">Framework for stochastic modelling of long-term non-homogenous data</a>	2023



	<a href="#">with non-Gaussian characteristics for machine condition prognosis</a> , Mechanical Systems and Signal Processing 184, 109677	
9.	M. Balcerek, K. Burnecki, S. Thapa, A. Wyłomańska, A. Chechkin: <a href="#">Fractional Brownian motion with random Hurst exponent: accelerating diffusion and persistence transitions</a> , Chaos 32, 093114	2022
10.	D. Szarek, K. Maraj-Zygmąt, G. Sikora, D. Kraft, A. Wyłomańska: <a href="#">Statistical test for anomalous diffusion based on empirical anomaly measure for Gaussian processes</a> , Computational Statistics & Data Analysis 168, 107401	2022

### 3. Projects and grants

List of the most important 5 projects/grants with basic description including: title, source(s) of funding, name of the call, role in the project (e.g., principal investigator).

1.	Role in the project (e.g., principal investigator, work package leader, etc.)	Principal investigator
	Project title	Anomalous diffusion processes and their application to real data modelling
	Sources of funding	National Science Centre
	Name of the call	OPUS
	Implementation period	27.01.2017-26.01.2020
2.	Role in the project (e.g., principal investigator, work package leader, etc.)	Principal investigator
	Project title	Specification for a platform-based, scalable data acquisition, management and processing system adapted for expert fusion of information by statistical and intelligent methods, dedicated to the implementation of the smart city (Smart City) concept
	Sources of funding	City Hall of Wrocław (Office of Cooperation with Higher Education Institutions)
	Name of the call	MOZART
	Implementation period	1.10.2020-30.09.2021
3.	Role in the project (e.g., principal investigator, work package leader, etc.)	Work package leader
	Project title	A universal diagnostic and prognostic module for condition monitoring systems of complex mechanical structures operating in the presence of non-Gaussian disturbances and variable operating conditions
	Sources of funding	National Centre for Research and Development
	Name of the call	Szybka Ścieżka
	Implementation period	1.10.2021-31.12.2023
4.	Role in the project (e.g., principal investigator, work package leader, etc.)	Workpackage leader
	Project title	NonGaussMech - New methods of processing non-stationary signals (identification, segmentation, extraction, modeling) with non-Gaussian characteristics for the purpose of monitoring complex mechanical structures
	Sources of funding	National Science Centre



	Name of the call	Sheng
	Implementation period	1.02.2022-31.01.2025
5.	Role in the project (e.g., principal investigator, work package leader, etc.)	Work package leader
	Project title	Market risk model identification and validation using novel statistical, probabilistic, and machine learning tools
	Sources of funding	National Science Centre
	Name of the call	OPUS
	Implementation period	14.01.2021-13.01.2025

#### 4. International experience

*Brief description of international cooperation and experience (e.g., research stays, cooperation with foreign entities, coordination or participation in international projects or programmes, keynote speeches and presentations delivered at renowned international conferences, visiting professor stays, invited lectures).*

No.	Description	Year(s)
1.	Cooperation with Colorado State University, prof. D. Krapf	From 2017
2.	Cooperation with Potsdam University, prof. R. Metzger, prof. A. Chechkin	From 2010
3.	Cooperation with IIT Madras, prof. S. Sundar, prof. A. Kumar, prof. N. S. Upadhye, dr P. Giri	From 2016
4.	Cooperation with Max Planck Institute, Dresden, prof. H. Kantz, dr S. Thapa	From 2018
5.	Cooperation with Lappeenranta Tech. Univ., prof. M. Jablonska-Sabuka	From 2013
6.	Cooperation with INSA Lyon, prof. J. Antoni	From 2018
	Cooperation with Ecole Polytechnique, prof. D. Grebenkov, dr Y. Lanoiselée	From 2018
7.	Research stays and invited lectures: Lappeenranta Tech. Uni. (Finland), Colorado State University (USA), Potsdam University (Germany), Max Planck University Dresden (Germany),	From 2013

#### 5. Experience in teaching doctoral students

*Brief description of experience in teaching doctoral students (e.g., courses in doctoral schools and PhD studies, summer/winter schools for doctoral students, tutorials, trainings, etc.).*

No.	Description	Year(s)
1.	Research Skills (course for PhD students)	From 2021
2.	Mathematical methods in the analysis of experimental data (course for PhD students)	From 2016
3.	Vice-dean for PhD students – Doctoral School of Wrocław University of Science and Technology	From 2020-current

#### 6. List of supervised doctoral students

*List of all supervised doctoral students that defended the PhD including: name of the student, dissertation title, year of awarding PhD.*

No.	Name, surname	Dissertation title	Year of awarding PhD
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1.	Ł. Bielak	Application of stochastic processes for modelling market risk factors in a mining company	2023
2.	J. Hebda-Sobkowicz	Modeling processes in mining and geology using stochastic processes	2023
3.	P. Kruczek	Cyclostationary random sequences with stable noise and their applications	2022
4.	A. Grzesiek	Dependence structure analysis for two-dimensional autoregressive model with $\alpha$ -stable noise	2022
5.	P. Giri	Estimation of multidimensional autoregressive (AR) and periodic autoregressive (PAR) time series models with alpha-stable distribution	2021
6.	D. Kucharczyk	Change point detection problem in time series data	2018
7.	G. Żak	Local damage detection methods in mining machines in presence of non-Gaussian noise	2018
8.	R. Połoczański	"The processes of anomalous diffusion in the application to description of the indoor air quality"	2018

## 7. Prizes and awards

*The most important national and international prizes and awards related to research, development and teaching activities.*

No.	Description	Year
1.	Special award of the Rector of Wrocław University of Science and Technology Docento Discimus for special achievements in teaching	2018
2.	Award of the Rector of Wrocław University of Technology in recognition of outstanding contributions to the university	2015, 2017, 2018, 2019, 2020, 2021, 2022
3.		

## 8. Other significant achievements

*Information on other significant achievements related to research, development and teaching activities.*

Selected conference lectures:

- "Structure break point detection for anomalous diffusive processes", 7th European Seminar on Computing (ESCO 2020), Pilsen, Czech Republic, 4-6.06.2020
- "Heavy-tailed stochastic models with time-dependent coefficients: applications to financial time series", 12th International Conference of the ERCIM WG on Computational and Methodological Statistics, 13th International Conference on Computational and Financial Econometrics, London, UK, 14-16.12.2019
- „How to Model Data with Anomalous Diffusion Behavior?", Department of Mathematics and Statistics, University of Nevada, Reno, USA, 13.09.2018



- 6th European Seminar on Computing, invited talk „How to Recognize the Anomalous Diffusion?”, Pilsen, Czech Republic, 03.06.2018-08.06.2018
- Cykl wykładów dla studentów i przedstawicieli przemysłu “Advanced Mathematical Methods for Real Data Analysis: From Partial Differential Equations Approach to Time Series Modelling” w ramach programu GIAN (finansowanego przez Ministry of Human Resource Development Government of India), 05.03.2018-10.03.2018
- The Eleventh Workshop on Non-Stationary Systems and Their Applications, invited talk „Testing of the anomalous diffusion behavior”, Gródek nad Dunajcem, Poland, 11.02.2018-15.02.2018
- International Conference Theory and Modeling of Complex Systems in Life Sciences, invited talk „Statistical tools for anomalous diffusion recognition”, Sankt Petersburg, Russia, 19.09.2017-22.09.2017
- 11th IEEE International Symposium on Diagnostics for Electric Machines, Power Electronics and Drives SDEMPED 2017, plenary talk (with cooperation with R. Zimroz) „Diagnostics of processes and machines in mining industry”, Tinos, Greece, 29.08.2017-01.09.2017
- Mini Conference on Industrial Applications of Mathematics, invited talk „Statistical methods for processing and signals modelling in application to technical diagnostics”, Polska Akademia Nauk, Warszawa, 04.07.2017
- The Tenth Workshop on Non-Stationary Systems and Their Applications, invited talk „Application of tempered stable distribution for selection of optimal frequency band in gearbox local damage detection”, Gródek nad Dunajcem, Poland, 05.02.2017-09.02.2017
- Wrocław-Potsdam meeting on dynamics, invited talk „Stable distribution-based stochastic modeling in application to time series eye movement”, Potsdam, Germany, 07.12.2016-08.12.2016
- International Conference on „Advances in Scientific Computing”, plenary talk „Statistical methods for processing and signals modelling in application to technical diagnostics”, Indian Institute of Technology Madras, India, 28.11.2016-30.11.2016
- International Conference on Applicable Mathematics, invited talk „Anomalous diffusion models as tool of real data description”, Stella Maris College, Chennai, India, 20.11.2016-01.12.2016
- „Anomalous diffusion models as tools to real data description”, Department of Mathematics, Indian Institute of Technology, Madras, India, 31.03.2016
- „Codifference as a practical tool to measure interdependence”, Department of Mathematics, Indian Institute of Technology, Madras, India, 07.04.2016
- The Ninth Workshop on Non-Stationary Systems and Their Applications, invited talk „Co-difference as a practical tool to measure the interdependence”, Gródek nad Dunajcem, Poland, 07.02.2016-11.02.2016
- International Conference Stochastic Modeling of Anomalous Dynamics in Complex Physical and Biological Systems, invited talk „Subordinated continuous-time autoregressive (CAR) processes with applications”, Wrocław, Poland, 14.05.2015-16.05.2015.