

ACADEMIC TEACHER PROFESSIONAL EXPERIENCE DOCTORAL SCHOOL OF WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

1. Basic information

Name, surname:	Piotr Kowalczyk
Grade / Title:	dr hab. inż. (PhD habilitation engineer)
Scientific discipline	Mathematics
Faculty:	Mathematics
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Link to home page and/or research profiles (Google Scholar, ResearchGate, etc.)	https://prac.im.pwr.edu.pl/~kowalczykp/

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.	M. Desroches P. Kowalczyk, and S. Rodrigues, Discontinuity induced	2024
	dynamics in Conductance-Based Adaptive Exponential Integrate-and-Fire	
	Model, Bulletin of Mathematical Biology	
2.	Zofia Wróblewska, P. Kowalczyk, and Krzysztof Przednowek, Leg stiffness	2024
	and energy minimization in human running gaits, Sports Engineering	
3.	Zofia Wróblewska, P. Kowalczyk, and Łukasz Płociniczak, Stability of fixed	2023
	points in an approximate solution of the spring-mass running model, the IMA	
	Journal of Applied Mathematics	
4.	P. Kowalczyk, Łukasz Płociniczak and Zofia Wróblewska, Energy variations	2022
	and periodic solutions in a switched inverted pendulum model of human	
	running gaits, Physica D	
5.	M. Desroches P. Kowalczyk, and S. Rodrigues, Spike-adding and reset-	2021
	induced canard cycles in adaptive integrate and fire models, Nonlinear	
	Dynamics	
6.	P. Kowalczyk, The dynamics and event-collision bifurcations in switched	2020
	control systems with delayed switching, Physica D	
7.	P. Kowalczyk, A novel route to a Hopf-bifurcation scenario in switched	2017
	systems with dead zone, Physica D	
8.	P. Glendinning, P. Kowalczyk, and A. B. Nordmark, Multiple attractors in	2016
	grazing-sliding bifurcations in Filippov type flows, the IMA Journal of Applied	
	Mathematics, 2016	
9.	S. Nema, P. Kowalczyk, and I. Loram, Complexity and dynamics of switched	2015
	human balance during quiet standing, Biological Cybernetics, 2015	
10.	S. Nema, P. Kowalczyk, Detecting abrupt changes in a noisy Van der Pol type	2015
	oscillator, Differential Equations and Dynamical Systems, 2015	

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
	principal investigator,	
	work package leader, etc.)	
	Project title	Abrupt changes in the behaviour of hybrid systems
		in discontinuity induced multiple attractors bifurcations
	Sources of funding	EPSRC (United Kingdom)
	Name of the call	First Grant Scheme
	Implementation period	2013 - 2014
2.	Role in the project (e.g.,	
	principal investigator,	
	work package leader, etc.)	
	Project title	
	Sources of funding	
	Name of the call	
	Implementation period	
3.	Role in the project (e.g.,	
	principal investigator,	
	work package leader, etc.)	
	Project title	
	Sources of funding	
	Name of the call	
	Implementation period	
4.	Role in the project (e.g.,	
	principal investigator,	
	work package leader, etc.)	
	Project title	
	Sources of funding	
	Name of the call	
	Implementation period	
5.	Role in the project (e.g.,	
	principal investigator,	
	work package leader, etc.)	
	Project title	
	Sources of funding	
	Name of the call	
	Implementation period	

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.	Department of Engineering Mathematics, University of Bristol, United	2000-2002
	Kingdom. PhD in numerical and analytical investigation of sliding	
	bifurcations in Filippov type systems	
2.	Full time position as a Research Assistant in the Department of	2003-2005



	Engineering Mathematics, University of Bristol Analysis and computation of	
	bifurcations in piecewise-smooth (PWS) dynamical systems	
3.	Full time lecturer of Applied Mathematics in the School of Engineering,	01.01.2006-
	Computer Science and Mathematics, University of Exeter.	31.01.2008
4.	Full time position as a Research Associate in the Centre for Interdisciplinary	01.02.2008-
	Computational and Dynamical Analysis (CICADA) School of Mathematics,	28.02.2011
	The University of Manchester	
	Analysis of bifurcations in hybrid systems (systems modelled by sets of	
	differential equations and discrete mappings)	
5.	Full time position as a Senior Lecturer of Mathematics, School of	01.03.2011-
	Computing, Mathematics and Digital Technology, Manchester	31.01.2018
	Metropolitan University	
6.	Invited speaker: ``Dynamics of Piecewise-Smooth Slow-Fast Systems", SIAM	2010
	conference on Emerging Topics in Dynamical Systems and Partial	
	Differential Equations DSPDEs'10, Barcelona, Spain	
7.	Minisymposium organiser and speaker: ``Dynamics and bifurcations of	2013
	hybrid systems", SIAM Conference on Applications of Dynamical Systems,	
	Snowbird Ski Resort, Utah USA	
8.	Minisymposium organiser: ``Multiple-Timescale Dynamics with a View	2023
	Towards Biological Applications", SIAM Conference on Applications of	
	Dynamical Systems, Snowbird Ski Resort, Utah USA	
9.	EUROMECH colloquium co-organiser ``Recent Advances in Non-Smooth	2025
	Dynamics" Exeter, UK	(upcoming)

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.	``Dynamics of digitally controlled systems with switched vector fields", 6th	2011
	SICC International School: Topics in nonlinear dynamics, Urbino Italy	
2.	``Stability and Bifurcations in Piecewise-Linear systems", IMUS DOC-	2012
	COURSE, Sevilla, Spain	
3.	``Multiple attractors in grazing-sliding bifurcations of three-dimensional	2013
	Filippov type flows", 8th SICC International School:	
	Topics in nonlinear dynamics, Urbino Italy	

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
1.	Co-supervisor (second supervisor) of Zofia Wróblewska	Odwrócone sprężyste wahadło jako matematyczny model biegu (Spring-mass Inverted pendulum as a mathematical model of human running)	2024

7. Prizes and awards



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

No.	Description	Year
1.	Teaching Award, MMU (Manchester Metropolitan University)	2012

8. Other significant achievements

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

Books (based on my research)

M. di Bernardo, C. J. Budd, A. R. Champneys and **P. Kowalczyk**, *Bifurcation and Chaos in Piecewise-smooth Dynamical Systems*: Theory and Applications, Springer-Verlag, 2008

Contribution to books (based on my research)

M. di Bernardo, A. R. Champneys, **P. Kowalczyk**, *Corner collision and grazing sliding: practical examples of border collision bifurcations*, Chaotic Dynamics and Control of Systems and Processes in Mechanics, Springer Verlag, 2003

PGCE Diploma (Postgraduate Course in Education Diploma, MMU, UK, 2013)

Member of an EU funded and EU wide SICONOS project aimed at developing numerical and analytical tools for the analysis of systems with discontinuous nonlinearities (2003-2005, Bristol, UK) https://upcommons.upc.edu/bitstream/handle/2099/1557/SICONOS.pdf?sequence=1&isAllowed=y

Member of an EPSRC funded (2008-2012, Manchester, UK) interdisciplinary centre CICADA – Centre for Interdisciplinary Computational and Dynamical Systems Analysis