

Institute of Control and Computation Engineering

2025 Annual Report



Warsaw University of Technology
Faculty of Electronics and Information Technology
Institute of Control and Computation Engineering
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From the Director

The Institute of Control and Computation Engineering (ICCE; in Polish: Instytut Automatyki i Informatyki Stosowanej) was founded in 1955 as the Chair of Automatic Control and Telemechanics by Professor Władysław Findeisen. It was reorganized in 1970 to become the Institute of Automatic Control. The rapid development of microprocessor technology and its impact on the field of control in subsequent years directed the interest of the research staff and students towards computational and algorithmic aspects of control, decision support, man-machine interfaces, network communications, etc. This resulted in 1994 in the creation of new educational profiles offered by the Institute and a change of its name to the present one.

The Institute offers courses in Automatic Control and Robotics as well as in Computer Science, both at three levels of education (undergraduate, postgraduate, Ph.D.). We are proud to offer interesting opportunities to our postgraduates so that they can continue their studies and research towards a Ph.D. It is important that our postgraduate and Ph.D. courses are open to candidates with different educational backgrounds. Our courses attract more and more candidates who graduated from various universities with degrees in different fields, not only in Automatic Control and Robotics or Computer Science. During the last few years, we have made an effort to organize and equip new laboratories located in a new part of our building. Currently, all our students benefit from new laboratories, without which offering a few new courses would be impossible. This standard educational offer has been supplemented by postgraduate studies: Management of Information Technology Resources and Project Management, organized by Dr. Andrzej Zalewski.

I regret that I have to convey this sad information that two of our former faculty members passed away in 2025: Prof. Radosław Ładziński and Prof. Andrzej Pacut.

In 2025, we witnessed three changes in the employment status of our staff. Namely, Dr. Klara Borowa and Dr. Michał Falkowski were employed as assistant professors. Dr. Andrzej Stachurski retired. I sincerely thank him for his many years of dedicated service to Warsaw University of Technology and the Institute.

In 2025, Dr. Piotr Arabas received his D.Sc. for the scientific achievement entitled *Resource Allocation Control in Energy-Efficient Networks and Distributed Data Processing Systems*. Dr. Klara Borowa received her Ph.D. degree for the thesis entitled *Cognitive Biases in Architectural Decision-Making: Impact and Debiasing Strategies* (supervised by Dr. Andrzej Zalewski).

This year, the Institute obtained six new grants. The Sonata Miniatura project *Trustworthy Artificial Intelligence for Software Architecture: Ethical Dilemmas in Using Generative AI for Architectural Design* (headed by Dr. Klara Borowa) was obtained from the National Science Center. The grant *Digital Twins for Household Autonomous Robots* (headed by Dr. Artur Wilkowski) was obtained from the NAWA Agency. The project *iCampus WUT – Development of a Concept and Pilot Implementation of an IoT Sensor System to Support the Creation and Development of a Smart WUT Campus* (headed by Dr. Piotr Pałka) was obtained from The Excellence Initiative Research University (IDUB) of Warsaw University of Technology. Two projects were obtained from the Scientific Council of the discipline Automation, Electronics, Electrical Engineering and Space Technologies of Warsaw University of Technology: *Physics-Guided Neural Networks and Their Application in Advanced Control Algorithms* (headed by Prof. Maciej Ławryńczuk) and *Task and Motion Planning for Service Robots* (headed by Dr. Dawid Seredyński). Dr. Mariusz Kaleta obtained a Rector's Grant for the Kraken Student Research Group. Additionally, three domestic contract work projects were obtained. Prof. Paweł Domański obtained the project *Feasibility Study for Boiler K6 (optionally K3) from*

EC3 Veolia Energia Łódź S.A. Dr. Andrzej Zalewski obtained two projects from the Polish National Committee of Electric Energy: *Assessment of the Feasibility of Launching NMWI for the Entire Electricity Market in Poland within the Currently Legally Specified Deadline* and *Recommendation Regarding a Comprehensive Implementation Plan for a New Information Exchange Model via CSIRE in a Safe and Predictable Manner for all Market Participants, the Energy Market Information Operator Responsible for Launching and Administering CSIRE, as Well as Other Users Authorized to Use CSIRE*. Moreover, the Industrial PhD Program was obtained with funding from the Minister of Education and Science for a PhD student of the WUT Doctoral School, Henryk Giemza (supervised by Prof. Ewa Niewiadomska-Szynkiewicz).

The following faculty members received the Rector's Awards for their achievements: Prof. Cezary Zieliński (together with Prof. Teresa Zielińska from the Faculty of Power and Aeronautical Engineering) received the 1st Class Award for organizational achievements, Dr. Tomasz Kruk received the Rector's Award for excelling in the "Golden Chalk" competition organised by the students, Dr. Klara Borowa, Dr. Piotr Pałka, and Dr. Mariusz Kaleta (together with Prof. Robert Olszewski from the Faculty of Geodesy and Cartography) received the 2nd Class Award for didactic achievements, Prof. Maciej Ławryńczuk and Prof. Tomasz Traczyk received the 2nd Class Award for didactic achievements.

I am pleased to congratulate all the above-mentioned staff members for their achievements.

Cezary Zieliński

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1 General Information

The following information about organization of the Institute reflects the situation on December 31, 2025.

1.1 Directors

Professor Cezary Zieliński
Professor Maciej Ławryńczuk, Deputy Director for Research
Professor Tomasz Traczyk, Deputy Director for Academic Affairs

1.2 Organization of the Institute

Complex Systems Group

Leader of the Group: prof. dr hab. E. Niewiadomska-Szynekiewicz
Group members: dr P. Arabas, dr E. Bartuzi-Trokielewicz, dr K. Ciecierski, mgr M. Hałoń, dr hab. M. Kamola, dr hab. A. Karbowski, dr T.J. Kruk, dr M. Trokielewicz, dr M. Koryciński
Ph.D. Student: mgr B. Laskowska, mgr A. Nwachukwu, mgr K. Roszczewska, mgr H. Gienza, mgr B. Guś, mgr T. Waksmundzki, mgr A. Sawilska (since Oct 2025)

The main area of interest are problems of modeling, design, control, optimization and simulation of various types of complex real systems, including networks, ad hoc networks, social networks, economic systems and the environment. Research in the field of optimization and control are focused on developing the theory and methodology in applying model predictive control, hierarchical control structures in nonlinear systems with uncertainty, developing methods for solving continuous and discrete time optimization problems (including evolutionary optimization methods and using the arithmetic of intervals), game theory and design theory of complex systems of rules (so-called theory of mechanisms). Research in the field of computer simulation and parallel processing of information concerning such departments as: distributed operating systems, programming of parallel machines in computer networks, clusters, grids and GPUs, the creation of systems for computer-aided design and management. Particular attention is devoted to issues of modeling, management and security in computer networks, including sensor networks and mobile ad hoc networks.

Research of the group is centered on biologically inspired information processing and control, including biometrics, machine learning, uncertainty modeling, and biological modeling. Biometrics consists in using personal characteristics for identity recognition. Our

research is focused mainly on safety of biometrics software, systems, and applications. In particular, safety issues are investigated for iris, fingerprints, and finger veins. Safety of biometric data storage and exchange and data encryption using biometrics are investigated. Original recognition methodology is developed for iris hand-written signature, 3D face and EEG. Machine learning research is focused on reinforcement learning, applied to adaptive control and multi-agent systems including very large systems and adaptive network routing. Also, learning in neural networks and modeling granularity is investigated.

Robot Programming Group

Leader of the Group: prof. dr hab. C. Zieliński

Group members: dr W. Dudek, dr M. Figat, dr D. Seredyński, dr hab. W. Szytniewicz, dr T. Winiarski, mgr D. Giełdowski

Ph.D. Students: mgr D. Giełdowski

Research of the group is concerned with robot control system design and in particular robot programming methods. The group focuses on robot system architectures, their specification and implementation. Service robots are at the centre of interest. The research encompasses manipulation and grasping, especially two handed manipulation, utilizing force and impedance control. It also deals with mobile robot localization and navigation. Special emphasis is placed on sensor-based motion planning and control of single and multiple robots.

Machine Perception Group

Leader of the Group: prof. dr hab. W. Kasprzak

Group members: dr A. Wilkowski, mgr M. Stefańczyk

Ph.D. Students: mgr P. Piwowarski

The research interests are in pattern recognition and machine learning techniques and their applications to image and speech analysis. Lately, the focus in image analysis is on bridging the semantic gap between object recognition in images/video and ontology-based image and scene representation. For this purpose RGB-D images and 3-D point clouds are intensively being processed. Machine learning techniques are applied for object detection and recognition in images and video, as well as for speech- and speaker recognition. Besides robot perception systems, the eyed application fields are multi-modal human-machine interfaces, automatic surveillance data analysis and biometrics – suitable gesture recognition- and speech/speaker recognition methods are developed and implemented.

Control Engineering Group

Leader of the Group: prof. dr hab. M. Ławryńczuk

Group members: dr P. Chaber, prof. dr hab. P. Domański, dr M. Falkowski (since March 2025), mgr J. Gustowski, mgr R. Nebeluk, dr hab. P. Marusak, dr S. Plamowski, prof. dr hab. P. Tatjewski, dr A. Wojtulewicz, mgr K. Zarzycki, mgr inż. M. Zakrzewski

Research of the group concentrates on advanced control engineering techniques and their applications in control of industrial process and in embedded systems. The focus is on model predictive control algorithms, multilayer optimizing and supervisory control, fault detection and fault-tolerant control. Among others, soft computing methods are used in the considered algorithms (neural networks, fuzzy systems and genetic algorithms). The Advanced Control Systems Laboratory offers the possibility to verify developed theoretical solutions. The laboratory is equipped with a set of test processes. For control of industrial

process, a Distributed Control System (DCS) cooperating with a Supervisory Control and Data Acquisition (SCADA) software platform and Programmable Logic Controllers (PLC) are used. For control of embedded systems, microcontrollers equipped with numerous sensors and actuators are used.

Software Engineering Group

Leader of the Group: dr hab. A. Zalewski

Group members: dr K. Borowa, dr S. Kijas, mgr W. Macewicz, dr M. Szlenk,
dr A. Ratkowski

The main area of interest is the development and maintenance of software. Topics include software processes, software analysis and design methods, and the methods for software quality evaluation. New approaches to the assessment of high-level system architecture in the earliest phases of software development are investigated. Methods for architectural decision modeling during the evolution of service-oriented (SOA) systems are developed. Part of the research is aimed at security and trust management issues in distributed open applications.

Decision Support and Operations Research Group

Leader of the Group: dr hab. K. Pieńkosz

Group members: dr J. Granat, dr hab. M. Kaleta, dr B. Kozłowski, dr A. Krzemie-
nowski, dr P. Pałka, mgr J. Sobczyk, dr hab. A. Stachurski (until
Sept. 2025), dr T. Śliwiński, dr T. Traczyk, dr I. Żółtowska

Ph.D. Students: mgr W. Burzyński

Research of the group is focused on the optimization and decision support methods for various classes of decision problems. They cover the whole area of linear, nonlinear and discrete optimization models, as well as data extraction methods and knowledge engineering. An important direction of research are methods for supporting management processes and multiple-criteria analysis techniques for decision making under uncertainty and risk. This applies to both centralized structures of management systems and distributed ones operating under market competition. Multi-agent systems and auction mechanisms are also being developed for competitive multicommodity markets with broad application prospects in a variety of infrastructure fields.

1.3 Statistical Data

FACULTY and STAFF	2023 persons	2024 persons	2025 persons
Academic Staff	45(+2)	47(+0)	47(+0)
by titles/degrees			
Professors	5	6	6
D.Sc.-s	9	8	8
Ph.D.-s	24(+0)	24(+0)	25(+0)
M.Sc.-s	7	9	8
Others	0	0	0
by positions			
Professors	8	8	8
Readers	0	0	0
Assistant Professors	29(+0)	30(+0)	31(+0)
Senior Lecturers	0	0	0
Assistants	8	9	8
Ph.D. Students	11	9	8
Technical Staff	1	1	1
Administrative Staff	8	8	7

+ – corrections due to persons on long-term leave of absence

ACTIVITIES	2023	2024	2025
Teaching activities			
standard teaching potential, hours	10 185,0	10 149,4	9 839,0
# hours taught	10 474,2	10 345,4	14 627,8
Degrees awarded			
Professor	0	1	0
D.Sc	0	0	1
Ph.D.	4	3	1
M.Sc.	72	77	99
B.Sc.	69	68	69
Research projects			
granted by WUT	7	9	8
granted by State institutions	3	1	3
granted by international institutions	1	1	0
other	2	1	2
Sci.-Tech. publications			
monographs (authored or edited)	1	2	3
chapters in books and proceedings	18	31	11
papers in journals	39	37	57
Reports, abstracts and other papers	0	2	6
Conferences			
participation (# of conferences)	13	14	16
participation (# of part. from ICCE)	35	29	19

RESOURCES	2023	2024	2025
Space (sq.m.)			
laboratories	644	644	644
library + seminar room	182	182	182
faculty offices	821	821	821
Computers			
personal computers	255	226	226
Library resources			
books	2 746	2 756	2 756
booklets	3 430	3 575	3 575
journals subscribed	9	9	9

2 Faculty and Staff

Presentation of our faculty starts with Professors Emeriti and continues with Senior Faculty, Supporting Faculty, Ph.D. Students, and Administrative Staff. Senior Faculty includes Professors, Readers, Assistant Professors, and Senior Lecturers. By Supporting Faculty we understand Lecturers, Assistants, Research Associates, and Software Engineers, as well as Technical Staff. The personal information below regards the period of January 1 – December 31, 2018.

2.1 Professors Emeriti

Ładziński Radosław Professor (retired January 1998)

Complex Systems Group

M.Sc. 1952, Ph.D. 1957 from WUT; the title of Professor of Technical Sciences awarded in 1968.

With WUT since 1949. Vice-Dean of the Faculty of Electronics, (1964–1969), head of the Ph.D. Program in Control Engineering and Computer Science (1977–1981), chairman of the Electronics and Information Technology Committee for Ph.D. Degree in Control and Computer Engineering (1991–1996). As Professor Emeritus author of the programme and the first lecturer of the two basic Undergraduate Courses: *Dynamic System* and *Control*, both taught in English (1998–2007). Parallel working with Institute of Electrical Engineering of Polish Academy of Sciences (PAN) (1955–1962), and with Institute of Automatic Control of PAN (1963–1968). Post-Doctoral Scholar, Royal Institute of Technology, Stockholm, Sweden (1957), British Council Scholar, University of Cambridge, England (1959–60), Visiting Lecturer, Department of Mathematics, University of Ghana, Accra, Ghana (1962–63), Professor of Engineering Science, University of Mosul, Iraq (1970–74), Professor of Engineering Mathematics, Rivers State University of Science and Technology, Port Harcourt, Nigeria (1981–87), Member of Magdalene College, University of Cambridge, England.

Interests: Dynamic systems, control theory, and applied mathematics.

Krzysztof Malinowski Professor (Head of Division, retired Feb. 2019)

**Complex Systems Group
room 517**

M.Sc. 1971, Ph.D. 1974, D.Sc. 1978, the title of Professor of Technical Sciences awarded in 1989, appointed to ordinary professorship in 1994.

With WUT since 1971. Director of ICCE (1984–1996), Dean of the FEIT (1996–1999). Member of the Senate of the Warsaw University of Technology (1993–2002), Chairman of the Senate Committee on Academic Staff (1993–1996 and 1999–2002), Chairman of Senate Committee on Research (1996–1999). Member of the Polish Academy of Sciences (PAN) (Corresponding Member 1998–2016, Full Member 2016–), Member of the Warsaw Scientific Society (TNW), Chairman of the Committee of Automation and Robotics of Polish Academy of Sciences (PAN) (2007–2014, Professor in the Research and Academic Computer Network Institute (NASK), Vice-Chairman of the Scientific Council of NASK (2011–2015), Chairman of Task Group of Ministry of Science and Higher Education for assessment of applications for funding large scale research equipment and constructions (2011–2015), Chairman of the Scientific Council of the Industrial Institute for

Automation and Measurements (PIAP), Member of the IFAC Technical Committees on Optimal Control and on Large Scale Systems, Chair of the Council of Provost, Division IV: Engineering Science, Polish Academy of Sciences (2015–2018).

Interests: Hierarchical control, model-based predictive control of nonlinear systems, applications of optimization, management and control of computer networks.

Andrzej Pacut Professor (retired October 2022)

Biometric and Machine Learning Group

M.Sc. 1969, Ph.D. 1975, D.Sc. 2000 from WUT, the title of Professor of Technical Sciences awarded in December 2010.

With Warsaw University of Technology since 1969, first with the Institute of Mathematics (until 1978) then with ICCE. Visiting Assistant Prof. at Lefschetz Center for Dynamical Systems of Brown University, Providence, RI (1980–1981), Visiting Associate Prof. at Oregon State University, Corvallis, OR (1984 and 1986–1991). Deputy Director of ICCE 1985–1986 and 1993–2005. Senior Member of IEEE. Vice Chairman (2001–2005) and Chairman (2006–2009) of the IEEE Poland Section, Chair of Tech. Committee No. 309 on Biometrics (2010–) and expert of Tech. Committee No. 182 on Information Security in IT Systems (2003–) of Polish Normalization Committee (PKN). Head of the NASK Biometric Laboratories (2003–), member of NASK Research Council (2007–), vice-chair (2009–2011). Member of Scientific Council of Central Laboratory of Criminology (2011–).

Interests: Learning systems, system identification, biometrics, neural modeling, neural networks.

Jerzy Pułaczewski Senior Engineer (retired since October 2003)

Robot Programming Group

M.Sc. 1958, Ph.D. 1965 from WUT.

With WUT since 1956, Deputy Director of ICCE (1972–80 and 1993–96), Deputy Dean of the Faculty of Electronics (1981–87), Chairman of the Departmental Curriculum Committee (1981–90), member of the Senate of Warsaw University of Technology (1987–90). Scholarship in Moscow Electroenergy University (1958–59), the British Council scholarship at Cambridge University, UK (1965–66), visiting researcher at Minneapolis University, Minneapolis, MN (1980–81).

Interests: Digital control algorithms, process modeling and simulation, process control.

Jacek Szymanowski Professor (retired January 2000)

Complex Systems Group

M.Sc. 1962, Ph.D. 1966, D.Sc. 1983 from WUT.

With WUT since 1968. Visiting Professor, Laboratoire d'Automatique de Nantes, Ecole Centrale de Nantes, France, 1992, 1994, 1995, 1996, 1997. Retired since January 2000.

Interests: Simulation of control systems, linear and nonlinear programming, control applications of optimization techniques, operating systems.

Wiesław Traczyk Professor (retired January 2010)

Optimization and Decision Support Group

M.Sc. 1959, Ph.D. 1964, D.Sc. 1969 from WUT, the title of Professor awarded 1983.

With WUT since 1957, Vice-Dean of the Faculty of Electronics (1971–1975), Deputy Director (1975–1981) and Director of ICCE (1981–1984). Member of the Senate of Warsaw University of Technology (1981–1984), Chairman of the Senate Committee of Finances (1981–84). Professor of the University in Port Harcourt, Nigeria (1984–1987), Professor of the Institute of Telecommunications (1997–2006). Chairman of FEIT Committee for Ph.D. Degrees in Automatic Control and Computer Sciences (1990–2005). Head of ICCE Optimization and Decision Support Division (1997–2002).

Interests: Knowledge engineering, expert systems, artificial intelligence.

Eugeniusz Toczyłowski Professor (retired Oct. 2020)

Operations Research and Management Systems Group

room 516

E.Toczyłowski@ia.pw.edu.pl

M.Sc. 1973, Ph.D. 1976, D.Sc. 1989 from WUT, the title of Professor of Technical Sciences awarded in 2004.

With WUT since 1973. Head of Operations Research and Management Systems Division, Vice-Dean of the Faculty of Electronics at WUT (1990–1993), chairman of the Rector's Committee for University Computerization (1993–1999), Advisor to the Dean on Strategic Planning (1993–1996). Head of the Undergraduate Program in Information Systems for Decision Support (1992–2004). Member of the Section on Decision Support (since 1992) and the Section on Knowledge Engineering and Operations Research (2003–) of the Committee of Automation and Robotics of Polish Academy of Sciences, Member of the Scientific Council of the Systems Research Institute (IBS PAN) (since 2002), Member of Consulting Council EnergoProject S.A. (2003–2004), Member of Steering Committee of the Energy Market (2003–2004). Member of the Polish National Council for CO₂ Reduction Emission Program, and Head of the Energy Market Group (2009–), Member of the European Commission DG Advisory Group for Energy Roadmap 2050 (2011–).

Interests: Structural approaches to discrete optimization, operations research and management, management information systems, auction theory, competitive market design under constraints, low carbon economy design.

Andrzej P. Wierzbicki Professor (retired March 2004)

Optimization and Decision Support Group

A.Wierzbicki@ia.pw.edu.pl

M.Sc. 1960, Ph.D. 1964, D.Sc. 1968 from WUT, titles of Professor awarded in 1975 and 1992.

With WUT since 1961, half time since March 1997. Deputy Director of the ICCE (1971–1975), Deputy Dean (1971–1972) and then Dean of FEIT (1975–1978) member of the Senate (1975–1978), member or chairman of many university commissions.

Since 1978 working with the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria and served (1979–1984) as the chairman of the Systems and Decision Sciences Program. Visiting prof. at the University of Minnesota, Minneapolis,

MN, Brown University, Providence, RI (1970–1971), Kyoto University, Japan (1989–1990), Fernuniversitaet Hagen (1985) and Japan Advanced Institute of Science and Technology (2004–2007).

Director of the National Institute of Telecommunications in Poland (1996–2004). Chairman of the Commission of Applied Research of the State Committee for Scientific Research (KBN) (1991–1994). Chairman of the Consulting Panel for Promotion and Policy of Science of State Committee for Scientific Research (KBN) (1994–2000), Member of the Consulting Panel for Computer Infrastructure of Science KBN (1994–2000), Chairman of the Consulting Panel for International Scientific Cooperation of State Committee for Scientific Research (KBN) (2000–2004). Chairman of the Scientific Council of the Industrial Institute for Automation and Measurements (PIAP) (1991–2004), chairman of the Scientific Council of Scientific and Academic Computer Network NASK (1994–2004), and member of the Scientific Council of Institute of System Research (IBS PAN) (1992–2004). Member of the Committee of Automation and Robotics of Polish Academy of Sciences (PAN) (1970–2004). Member of the Committee for Future Studies “Poland 2000+” PAN (since 1986, deputy chairman since 2000). Member and deputy chairman of the Panel for Cooperation with IIASA of PAN.

Member of the Polish Association for the Club of Rome. Member of Polish Mathematical Society (PTM) (since 1975) and of Society of Polish Electrical Engineers (SEP) (1970–2004). Member of the Information Society Technology Advisory Group (ISTAG) of the European Commission (2000–2002). Recipient of George Cantor Award of the Int. Soc. of Multi-Criteria Decision Making for his results in multi-criteria optimization theory and decision support methodology (1992). Recipient of Tomasz Hofmokr Award of NASK for the promotion of informational society, 2005. Recipient of Best Paper Award at the Hawaii International Conference of Systems Science, 2005 for the paper: “Knowledge Creation and Integration: Creative Space and Creative Environments”.

Interests: Optimization theory and algorithms, decision theory, decision support systems, negotiation methods and experiences, applications in telecommunication, information society issues, knowledge creation and engineering.

2.2 Senior Faculty

Piotr Arabas Assistant Professor (part-time)

Complex Systems Group
room 573, tel. 22 234 7126
Piotr.Arabas@pw.edu.pl

M.Sc. 1996, Ph.D. 2004 from WUT, D.Sc. 2025 from WUT

With WUT since 2002.

Interests: Hierarchical systems, predictive control, management of telecommunication services.

Ewelina Bartuzi-Trokielewicz Assistant Professor (part-time)

Complex Systems Group
room 558, tel. 22 234 7805
ewelina.trokielewicz@pw.edu.pl

PhD 2022 from WUT

With WUT since 2023.

Interests: deep learning, computer vision, biometrics, voice recognition, iris recognition, face recognition, deepfake detection

Klara Borowa Assistant Professor

Software Engineering Group
room 562, tel. 22 234 7756
klara.borowa@pw.edu.pl

M.Sc. 2019, Ph.D. 2025 from WUT

With WUT since 2019.

Interests: Software engineering, software architecture, architecture decision making, requirements engineering

Patryk Józef Chaber Assistant Professor

Control Engineering Group
room 563, tel. 22 234 7124
patryk.chaber@pw.edu.pl

M.Sc. 2014, Ph.D 2018 from WUT.

Interests: Neural networks, microcontrollers, control algorithms, modelling.

Konrad Ciecierski Assistant Professor (part-time)

Complex Systems Group
room 573, tel. 22 234 7126
konrad.ciecierski@pw.edu.pl

PhD with distinction 2014 from WUT

With WUT 2011–2014 and again since 2023

Interests: decision support systems in neurosurgery, medical computer science, digital signal processing

Paweł Domański Professor

Control Engineering Group
room 522, tel. 22 234 7733
Pawel.Domanski@pw.edu.pl

Ph.D. 1996, D.Sc 2018 from WUT, the title of Professor of Technical Sciences awarded in 2024

With WUT since 1991.

Interests: Adaptive control, intelligent control, fuzzy logic.

Wojciech Dudek Assistant Professor (part time)

Robot Programming Group
room 573a, tel. 22 234 7860

wojciech.dudek@pw.edu.pl, <https://www.robotyka.ia.pw.edu.pl/team/wdudek>

M.Sc 2015, Ph.D. 2021 from WUT

With WUT since 2017

Interests: Mobile robots, navigation, distributed architectures, cloud computing.

Michał Falkowski Assistant Professor

Control and Computation Engineering
room 522, tel. +48 22 234 77 33
michal.falkowski@pw.edu.pl

Ph. D. 2024 from WUT

With WUT since 2017.

Interests: control algorithms, nonlinear systems analysis, transfer entropy, causality, mathematical modeling

Maksym Figat Assistant Professor

Robot Programming Group
room 566, tel. 22 234 7649
maksym.figat@pw.edu.pl

M.Sc. 2013 from WUT, Ph.D. 2022 from WUT.

With WUT since 2014. He is the recipient of the Polish Prime Minister's Award for an outstanding doctoral dissertation, the ABB Award, the NAWA Bekker Programme

(Poland), and the Kosciuszko Foundation Fellowship (United States). He has conducted research visits at NASA Jet Propulsion Laboratory in the US, Imperial College London in the UK, ONERA in France, and Griffith University in Australia.

Interests: formal methods for robotic system design, multi-robot and autonomous systems, robotic ontologies, and extended Petri nets for modelling and analysis.

Daniel Giełdowski Assistant

Robot Programming Group
room 566, tel. 22 234 7649
daniel.gieldowski@pw.edu.pl

M.Sc. 2013 from WUT.

With WUT since 2024.

Interests: reinforcement learning, robot control algorithms, cybersecurity of robots

Janusz Granat Assistant Professor

Decision Support and Operations Research Group
room 560A, tel. 22 234 7864
Janusz.Granat@pw.edu.pl, www.ia.pw.edu.pl/~janusz

M.Sc. 1986, Ph.D. 1997 from WUT.

With WUT since 1987, chairman of IFIP Working Group TC 7.6, Optimization-Based Computer Modeling and Design

Interests: Decision support systems, multicriteria decision analysis, data warehouses, decision support in telecommunication industry.

Jerzy Gustowski Assistant (part time)

Control Engineering Group
room 525, tel. 22 234 7699
Jerzy.Gustowski@pw.edu.pl

M.Sc. 1979 from WUT.

With WUT since 1979.

Interests: Low level software for computer control, interfacing, single-chip microcomputers, PLC controllers.

Michał Hałoń Assistant (part-time)

Complex Systems Group
room 560, tel. 22 234 7297
michal.halon@pw.edu.pl

M.Sc. 2018 from WUT.

With WUT since 2023.

Interests: Biometrics, Computer Vision, Artificial Intelligence.

Mariusz Kaleta Assistant Professor

Decision Support and Operations Research Group

room 561, tel. 22 234 7123

Mariusz.Kaleta@pw.edu.pl

M.Sc. 2000, Ph.D. 2005, D.Sc. 2022 from WUT

With WUT since 2003.

Interests: Discrete optimization, operations research and management, decision support in energy market.

Mariusz Kamola Assistant Professor (part-time)

Complex Systems Group

room 573, tel. 22 234 7126

Mariusz.Kamola@pw.edu.pl, www.ia.pw.edu.pl/~mkamola

M.Sc. 1997, Ph.D. 2004, D.Sc. 2022 from WUT.

With WUT since 2002.

Interests: Data analysis, machine learning, complex networks, cybersecurity, spiking networks.

Andrzej Karbowski Assistant Professor

Complex Systems Group

room 572, tel. 22 234 7632

Andrzej.Karbowski@pw.edu.pl, www.ia.pw.edu.pl/~karbowsk

M.Sc. 1983, Ph.D. 1990. D.Sc. 2012 from WUT

With WUT since 1983. Research visitor: Politecnico di Milano and Universita di Genova, 1992, Edinburgh Parallel Computing Centre, 2000. Editor of a special issue of the Energies journal: "Mixed-Integer Linear and Nonlinear Programming Methods for Energy Aware Traffic Control in Stationary Networks and Clouds"

Interests: Cybersecurity, large scale systems, distributed computations, optimal control and management in risk conditions, decision support systems, neural networks, environmental systems management, control and decision problems in computer networks.

Włodzimierz Kasprzak Professor

Machine Perception Group

room 516, tel. 22 234 7950

Wlodzimierz.Kasprzak@pw.edu.pl, www.ia.pw.edu.pl/~wkasprza

M.Sc. 1981, Ph.D. 1987 from WUT, Dr-Ing. 1997 from Univ. of Erlangen-Nuremberg, D.Sc. 2001 from WUT, the title of Professor awarded in 2014.

With WUT since 1997, Professor since 2005. Member of Polish Section of IAPR.

Interests: Computer vision, speech recognition, pattern classification, signal analysis, artificial intelligence.

Szymon Kijas Assistant Professor (part time)

Software Engineering Group

room 555, tel. 22 234 7997

szymon.kijas@pw.edu.pl

Ph.D. 2019 from WUT.

With WUT since 2019.

Mateusz Koryciński Assistant Professor (part time)

Complex Systems Group

room 565, tel. 22 234 7866

mateusz.korycinski@pw.edu.pl

M.Sc. 2013 from WUT.

With WUT since 2024.

Interests: deep learning, computer vision, medical data analysis, MRI, tractography

Bartosz Kozłowski Assistant Professor (part time)

Decision Support and Operations Research Group

room 519a, tel. 22 234 7863

Bartosz.Kozlowski@pw.edu.pl

M.Sc. 2004 from WUT.

With WUT since 2010.

Interests: Computer networks, data bases, operating systems, programming languages, text processing.

Tomasz Jordan Kruk Assistant Professor (part time)

Complex Systems Group

room 530, tel. 22 234 7922

Tomasz.Kruk@pw.edu.pl, www.ia.pw.edu.pl/~tkruk

M.Sc. 1994 from Technical University of Gdańsk. Ph.D. 1999 from WUT.

With WUT since 1999. Since 2018 cybersecurity expert of PIIT (The Polish Chamber of Information Technology and Telecommunications)

Interests: Operating systems, computer and network security, distributed systems.

Adam Krzemienowski Assistant Professor

Decision Support and Operations Research Group

room 553, tel. 22 234 7640

Adam.Krzemienowski@pw.edu.pl

Ph.D. 2007 from WUT.

With WUT since 2007. Visiting Lecturer at the University of Leeds, United Kingdom (2007–2008).

Interests: Optimization and decision support under risk, risk measures, stochastic programming.

Maciej Ławryńczuk Professor (Leader of the Group), (Deputy Director of the Institute)

Control Engineering Group

room 523

Maciej.Lawrynczuk@pw.edu.pl

M.Sc. 1998, Ph.D. 2003, D.Sc. 2013 from WUT, the title of Professor of Technical Sciences awarded in 2022.

With WUT since 2003. Twice awarded of “Gold chalk” („Złota kreda”) award. The coordinator of B.Sc. and M.Sc. studies in automation and robotics since 2011.

Interests: advanced process control algorithms, in particular Model Predictive Control (MPC) algorithms, set-point optimisation algorithms, artificial intelligence and soft computing techniques, in particular neural networks, modelling and simulation.

Piotr Marusak Assistant Professor

Control Engineering Group

room 567, tel. 22 234 7673

Piotr.Marusak@pw.edu.pl, www.ia.pw.edu.pl/~pmarusak

M.Sc. 1997, Ph.D. 2003, D.Sc 2020 from WUT.

With WUT since 2002.

Interests: Predictive control of nonlinear systems, digital control algorithms, process modeling and simulation, fuzzy control.

Robert Ryszard Nebeluk Assistant

Control Engineering Group

room 571, tel. 22 234 7861

Robert.Nebeluk@pw.edu.pl

M.Sc. 2019 from WUT

With WUT since 2019

Interests: Modelling, control algorithms, optimization, neural networks, machine learning algorithms.

Ewa Niewiadomska-Szynkiewicz Professor, Leader of the Group

Complex Systems Group

room 572a, tel. 22 234 3650

Ewa.Szynkiewicz@pw.edu.pl, www.ia.pw.edu.pl/~ens

M.Sc. 1986, Ph.D. 1995, D.Sc. 2005 from WUT, the title of Professor of Technical Science awarded in Feb. 2017. Member of the Foundation for the Promotion of Science Systems Polish Academy of Sciences (2017-)

Research Assistant at the Institute of Geophysics of Polish Academy of Sciences in (1987–1988), with WUT since 1988, Central Mining Institute (GIG) since 2022, NASK in (2001–2022), NASK Director for Research in (2009–2022), Member of Committee on Automatic Control and Robotics of the Polish Academy of Sciences (KAiR PAN) since 2011. Member of the Council for the Foundation of Systemic Sciences PAN since 2016. Member of of the Scientific Council of NASK in (2002–2022), Vice-Chairman in

(2008–2009). She was a member of the State Accreditation Committee working for the quality of education in Poland (2010–2016). Information Sharing and Analysis Center GIG (ISAC-GIG) member in (2022–2024), Chair of the Scientific Committee since 2025. Member of the Cyber Security Training Centre of Excellence since 2023. Member of IEEE.

Interests: Large scale systems, computer simulation, computer aided control systems design, environmental systems management, distributed computations, global optimization, telecommunication systems, ad hoc networks.

Piotr Pałka Assistant Professor

Decision Support and Operations Research

room 554, tel. 22 234 7648

Piotr.Palka@pw.edu.pl, <http://www.ia.pw.edu.pl/~ppalka>

M.Sc. 2005, Ph.D. 2009 from WUT.

With WUT since 2009. Member of the Rector's Team for the Innovative Forms of Education (2014–). Expert of Ministry of Economic Development on Industry Transformation (2016–2017).

Interests: multi-agent systems, agent-based modeling, smart cities, distributed decision systems, auction theory, IoT, innovative forms of education, problem based learning, design thinking.

Krzysztof Pieńkosz Assistant Professor, Leader of the Group

Decision Support and Operations Research

room 560a, tel. 22 234 7864

Krzysztof.Pienkosz@pw.edu.pl

M.Sc. 1984, Ph.D. 1992, D.Sc. 2011 from WUT.

With the Research Institute of Polish Gas and Oil Company 1984–1986, with WUT since 1986.

Interests: Operations research in particular discrete optimization, combinatorial algorithms, production planning and scheduling in manufacturing systems.

Sebastian Plamowski Assistant Professor

Control Engineering Group

room 567, tel. 22 234 7673

Sebastian.Plamowski@pw.edu.pl

M.Sc. 2000, Ph.D. 2006 from WUT.

With WUT since 2015.

Interests: Modeling and simulation, optimization, diagnostics, predictive control, SCADA and DCS systems.

Andrzej Ratkowski Assistant Professor**Software Engineering Group****room 555, tel. 22 234 7997**

Andrzej.Ratkowski@pw.edu.pl

M.Sc. 2005, Ph.D. 2011 from WUT.

With WUT since 2009.

Interests: Software engineering, Service Oriented Architecture, performance engineering, TT architectures.**Dawid Seredyński** Assistant Professor**Robot Programming Group****room 573a, tel. 22 234 7860**

Dawid.Seredynski@pw.edu.pl

M.Sc. 2012, Ph.D 2023 from WUT.

With WUT since 2015.

Interests: grasp planning, manipulation planning**Jerzy Sobczyk** Assistant**Decision Support and Operations Research Group****room 519A, tel. 22 234 7863**

Jerzy.Sobczyk@pw.edu.pl, www.ia.pw.edu.pl/~jurek

M.Sc. 1985 from WUT.

With WUT since 1984. FEIT Network Administrator.

Interests: Computer networks, system and network administration, programming languages, web applications, parallel and distributed programming, multi-criteria optimization.**Andrzej Stachurski** Assistant Professor (part time, until Sept. 2025)**Decision Support and Operations Research Group****room 553, tel. 22 234 7640**

Andrzej.Stachurski@pw.edu.pl, www.ia.pw.edu.pl/~stachurs

M.Sc. 1976, Ph.D. 1980, D.Sc 2013 from WUT.

Senior Assistant (1979–80) and then Assistant Professor (1980–92) at the Institute of System Research (IBS PAN), with WUT since 1992. Visiting Professor at the Calabria University, Italy, 1984, Åbo Swedish Academy in Turku, 1987, Jyväskylä University, Finland, 1988, JSPS invitee at the Department of Control Engineering, Osaka University, Japan, 1988–89. Member of Polish Society of Operations and Systems Research. Author and co-author of many scientific papers and reports on optimization algorithms, identification, applications of optimizations in macro-economy modeling and optimal design problems in structural engineering. Co-author of a textbook 'Podstawy optymalizacji' ('Foundations of Optimization') published in 1999. Reviewer of Control & Cybernetics, Optimization, Archives of Control Science, SIAM J. on Optimization, IEEE Concurrency.

Interests: Interests: nonlinear programming, large-scale optimization, applications to the optimal design problems in structural engineering, parallel and distributed calculations in Mathematical Programming.

Maciej Stefańczyk Assistant

Machine Perception Group

room 564

Maciej.Stefanczyk@pw.edu.pl

M.Sc 2011

With WUT since 2011

Interests: Computer vision, computer graphics.

Marcin Szlenk Assistant Professor

Software Engineering Group

room 555, tel. 22 234 7997

Marcin.Szlenk@pw.edu.pl

M.Sc. 2000, Ph.D. 2006 from WUT.

With WUT since 2005.

Interests: Software modeling, programming paradigms.

Wojciech Szyrkiewicz Professor

Robot Programming Group

room 517, tel. 22 234 7119

Wojciech.Szyrkiewicz@pw.edu.pl

M.Sc. 1985, Ph.D. 1996 from WUT, D.Sc. 2016 from WUT.

With WUT since 1985. Deputy Director of the Research Center for Control and Information-Decision Technology (1999–2003).

Interests: Robotics, multiple robots coordination, robot sensor-based manipulation and motion planning, autonomous navigation, real-time systems.

Tomasz Śliwiński Assistant Professor

Decision Support and Operations Research Group

room 561, tel. 22 234 7123

Tomasz.Sliwinski@pw.edu.pl

M.Sc. 1999, Ph.D. 2007 from WUT.

With WUT since 2004.

Interests: Discrete optimisation, operations research, decision support.

Piotr Tatjewski Professor (part time)

Control Engineering Group

room 524, tel. 22 234 6119

Piotr.Tatjewski@pw.edu.pl

M.Sc. 1972, Ph.D. 1976, D.Sc. 1988, the title of Professor of Technical Sciences awarded in 2003, appointed to ordinary professorship in 2006

With Warsaw University of Technology since 1972. Head of Control Engineering Group 1991–2015, Deputy Director of ICCE for Academic Affairs (1987–1991), Director of ICCE 1996–2008. Vice Dean for Research of the Faculty (2012–2020). Head of Control and Software Engineering Division (2006–2021), Head of the Undergraduate Degree Program in Computer Control Systems (1994–1996). DAAD scholarship in 1978 (TU Hanover), SERC research fellow at the City University, London (1986), visiting professor at the University of Birmingham (1992/1993). Member of Committee of Control and Robotics of Polish Academy of Sciences since 2004, Chair of the Automatic Control Systems Section of this Committee (2007–2015), Member of the Control and Robotics Section of the Scientific Research Council (KBN) 1997–2004. Member of Programme Committee of Int. Journal of Applied Mathematics and Computer Science, Journal of Automation, Mobile Robots and Intelligent Systems, Member of Editorial Advisory Board of ISA Transactions (2011–), Expert of Ministry of Education and Science for Educational Standards (2005–2006). Member of EUCA (European Union Control Association) Administrative Council (2008–2011), member of IFAC Technical Committees TC 2.1 and TC 5.4, Member of the Scientific Council of Systems Research Institute of Polish Academy of Sciences (2007–2022), vice-chairman of the Scientific Council (2011–2018). Member of the Polish Central Commission for Degrees and Titles (2017–2020). Member of Team of Experts of Ministry of Education and Science for evaluation of proposals and reports within the programme “PhD with industrial implementation” (2021–2023).

Interests: Advanced process control and optimization, model based predictive control, multi-layer control systems, decomposition methods in optimization and control, soft computing methods.

Tomasz Traczyk Professor (Deputy Director of the Institute)

Decision Support and Operations Research Group

room 518, tel. 22 234 7750, 6192

M.Sc. 1984, Ph.D. 1992 from WUT.

With WUT since 1984.

Interests: Applications of databases in management and control, long-term digital archives.

Mateusz Trokielewicz Assistant Professor (part-time)

Biometric and Machine Learning Group

room 558, tel. 22 234 7805

`mateusz.trokielewicz@pw.edu.pl`

M.Sc. 2014, Ph.D. 2019 from WUT.

With WUT since 2016. He is employed at the Institute of Control and Applied Informatics at the Faculty of Electronics and Information Technology, from 2016 to 2019 as an assistant, since 2019 as an assistant professor. Head of the Biometrics and Machine Learning Laboratory in the Complex Systems Group.

Interests: biometric methods of identity recognition, in particular iris biometrics, protection against attacks on biometric systems, image processing algorithms, artificial intelligence methods, and generation and detection of synthetic data.

Artur Wilkowski Assistant Professor

Systems Machine Perception Group

room 564

Artur.Wilkowski@pw.edu.pl

M.Sc Eng 2004, Phd 2012 from WUT

With WUT since 2006

Interests: Computer vision, Machine learning.

Tomasz Winiarski Assistant Professor

Robot Programming Group

room 565, 012, tel. 22 234 7866, 22 234 7117

tomasz.winiarski@pw.edu.pl, <http://robotyka.ia.pw.edu.pl/team/twiniarski>

M.Sc. 2002, Ph.D. 2009 from WUT.

With WUT since 2004.

Interests: Robot control systems, artificial intelligence, mobile robots, impedance control, manipulator force control, service robots, social robots, systems engineering.

Andrzej Marcin Wojtulewicz Assistant Professor

Control Engineering Group

room 563, tel. 22 234 7124

Andrzej.Wojtulewicz@pw.edu.pl

M.Sc. 2014, Ph.D 2020 from WUT

With WUT since 2016

Interests: Control theory, FPGA, microcontroller.

Maciej Zakrzewski Assistant

Control Engineering Group

room 571, tel. 22 234 7861

maciej.zakrzewski@pw.edu.pl

M.Sc. 2013 from WUT.

With WUT since 2024.

Interests: control algorithms, heat recovery systems, acoustic detection systems, embedded programming

Andrzej Zalewski Assistant Professor, Leader of the Group

Software Engineering Group

room 562, tel. 22 234 7756

Andrzej.Zalewski@pw.edu.pl

M.Sc. 1997, Ph.D. 2003, D.Sc 2015 from WUT.

With WUT since 2002. Member of Information Systems Audit and Control Association (ISACA).

Interests: Software engineering, real-time systems, timing requirements, concurrent systems, performance analysis for computer systems, IT project economics.

Krzysztof Zarzycki Assistant**Control Engineering Group****room 571, tel. 22 234 7861**

krzysztof.zarzycki@pw.edu.pl

M.Sc. 2020 from WUT.

With WUT since 2020.

Interests: Process modelling, model predictive control, neural networks.**Cezary Zieliński** Professor, Leader of the Group, Director of the Institute**Robot Programming Group****room 518A, tel. 22 234 5102**

Cezary.Zieliński@pw.edu.pl, www.ia.pw.edu.pl/~zielinsk

M.Sc. 1982, Ph.D. 1988, D.Sc. 1996 from WUT, the title of Professor of Technical Sciences awarded in 2012.

With WUT since 1985. Research visitor at Loughborough University of Technology, UK (1990, 1992), Senior Fellow at Nanyang Technological University, Singapore (1999–2001), Secretary of Priority Research Program in Control, Information Technology, and Automation (PATIA) (1994–1999). Member of the Forecast Committee of the Polish Academy of Sciences: Poland 2000 Plus (2003–2007, 2015–). Senior Member of IEEE (2002–), Vice Chairman of the Scientific Committee of the Industrial Research Institute for Automation and Measurement PIAP (2016–2017). Vice Dean for Research and International Cooperation FEIT (2002–2005), Head of ICCE Robot Programming and Pattern Recognition Group since 1996 (currently Robot Programming Group). Member of the board of EURON (European Robotics Network of Excellence, 2004–2008). Deputy Director of ICCE for Research (2005–2008), Director of ICCE (2008–2016), Vice Dean for General Affairs (2016–). Member of the Control and Robotics Committee of the Polish Academy of Sciences (2007–). Editor in Chief of Measurements-Automation-Robotics Technical Sciences Quarterly (PAR) (2017–). Head of Warsaw University of Technology Centre for Priority Research Area Artificial Intelligence and Robotics, established within the Excellence Initiative: Research University (IDUB) programme (2020–)

Interests: Robot programming methods, open-structure robot controllers, behavioral control, digital systems.**Izabela Żółtowska** Assistant Professor**Decision Support and Operations Research Group****room 554, tel. 22 234 7648**

Izabela.Zoltowska@pw.edu.pl, home.elka.pw.edu.pl/~imilenko

M.Sc. 2000, Ph.D. 2006 from WUT.

With WUT since 2005.

Interests: Operations, planning and economics of electric energy systems, optimization theory and its applications.

2.3 Supporting Faculty and Staff

Włodzimierz Macewicz Senior Software Engineer

Software Engineering Group

room 525, tel. 22 234 7699

`Wlodzimierz.Macewicz@pw.edu.pl`

M.Sc. from WUT.

With WUT since 1983.

Interests: Computer networks, data bases, operating systems, programming languages, text processing.

2.4 Ph.D. Students

Wojciech Burzyński Ph.D. Student (since Oct. 2023)

**Decision Support and Operations Research Group
room**

01133559@pw.edu.pl

Supervisor: Mariusz Kaleta

Daniel Giełdowski Ph.D. Student

Robot Programming Group
daniel.gieldowski.dokt@pw.edu.pl

Supervisor: Wojciech Szynkiewicz

Henryk Karol Giemza Ph.D. Student (since Oct. 2024)

Complex Systems Group
01202307@pw.edu.pl

Supervisor: Ewa Niewiadomska-Szynkiewicz

Bartłomiej Guś Ph.D. Student (since Oct. 2024)

Complex Systems Group
01140642@pw.edu.pl

Supervisor: Ewa Niewiadomska-Szynkiewicz

Barbara Laskowska Ph.D. Student

Complex Systems Group
barbara.laskowska.dokt@pw.edu.pl

Supervisor: Mariusz Kamola

Anthony Nwachukwu Ph.D. Student (until July 2025)

Complex Systems Group
Anthony.Nwachukwu.dokt@pw.edu.pl

Supervisor: Andrzej Karbowski

Katarzyna Roszczewska Ph.D. Student (since Oct. 2023)

**Complex Systems Group
room**
01025846@pw.edu.pl

Supervisor: Ewa Niewiadomska-Szynkiewicz

Ada Sawilska Ph.D. Student (since Oct. 2025)

Complex Systems Group
01143808@pw.edu.pl

Supervisor: Ewa Niewiadomska-Szynkiewicz

Tomasz Bronisław Waksmundzki Ph.D. Student (since Oct. 2024)

Complex Systems Group
01192844@pw.edu.pl

Supervisor: Ewa Niewiadomska-Szynkiewicz

2.5 Administrative and Technical Staff

Renata Kisielewicz Senior financial specialist.

room 526, tel. 22 234 7122
renata.kisielewicz@pw.edu.pl

M.A. 2005 from University of Insurance and Banking currently Vistula University

Elżbieta Matyjasiak Secretary, Main office.

room 521, tel. 22 234 7397, 22 825 0995
Elzbieta.Matyjasiak@pw.edu.pl

M.Sc. 2002 from Warsaw School of Management and Marketing.

Katarzyna Newelska-Pedowicz .

room 521, tel. 22 234 7397
Katarzyna.Pedowicz@pw.edu.pl

2001 from Łazarski University.

Sylwia Piskorska R&D Specialist (part time).

room 530, tel. 22 234 6156
Sylwia.Piskorska@pw.edu.pl

M.Sc.2002 from Technical University of Gdańsk

Dorota Podniesińska Manager, Finances.

room 526, tel. 22 234 6096
Dorota.Podniesinska@pw.edu.pl

M.Sc. 2007 from the M.Skłodowska-Curie Warsaw Academy

Agnieszka Słojewska Finances specialist (until August 2025).

room 526, tel. 22 234 7122
Agnieszka.Slojewska@pw.edu.pl

baccalaureate 2005 from Leon Kozmiński Academy of Entrepreneurship and Management

Alicja Trojanowska Secretary, Student affairs.

room 518, tel. 22 234 7750
Alicja.Trojanowska@pw.edu.pl

baccalaureate 2012 from WUT.

Beata Woźniak Manager, Administration.

room 521a, tel. 22 234 7397
Beata.Wozniak@pw.edu.pl

M.Sc. 1993 from Warsaw University.

3 Teaching Activities – Academic Year 2024/2025

3.1 Undergraduate and Graduate Studies

3.1.1 Fall

Course Title	Lecturer	Hours per sem.	Course code	Notes
Agent and Actor Decision Systems	P. Pałka	70	103A-INISY-MSP-AASD	
Applied Operations Research in Enterprises	I. Żółtowska	60	103A-INISY-MSP-ZBOP	
Audio Signal Analysis and Speech Recognition	W. Kasprzak	45	103A-INISY-MSP-EASAR	
Automation and Engineering Measurements	J. Gustowski	45	1020-TC000-ISP-PR30	for the Faculty of Chemistry
Automation and Engineering Measurements in Industry	J. Gustowski	30	1020-BISEM0-MSP-1001	for the Faculty of Chemistry
Automation and Engineering Measurements in Industry	J. Gustowski	30	1020-TC000-ISP-3006	for the Faculty of Chemistry
Biometrics Authentication	M. Trokielewicz	45	103B-IBxxx-ISP-BIT	
Biometrics Authentication	M. Trokielewicz	45	114A-IBxxx-ISP-BIT	
Case Studies (Biometry)	M. Trokielewicz	30	1120-MASMA-NSP-0234	for the Faculty of Mathematics and Information Science
Computer Networks	J. Sobczyk	60	103C-INxxx-ISP-SKM	
Computer Systems for Control and Measurement	D. Seredyński	60	103A-INxxx-ISP-SKPS	
Computer Vision	A. Wilkowski	45	1130-EMARO-MSA-1006	for EMARO/Robotics programme
Control Equipment	T. Winiarski	45	103B-ARxxx-MSP-APA	
Control Equipment	T. Winiarski	45	103A-ARxxx-ISP-APA	
Control Theory	P. Marusak	60	103D-ARxxx-MSP-TST	
Data Bases 2	T. Traczyk	45	103C-INxxx-ISP-BD2	
Data Modelling	T. Traczyk	45	103A-INISY-MSP-MODA	
Development of Control Systems (Group Project)	M. Ławryńczuk	75	103A-ARxxx-ISP-PUST	
Digital archives	T. Traczyk	45	103A-CBxxx-MSP-ARCY	
Dynamic Systems and Control	R. Nebeluk		103A-CTxxx-ISA-EDYCO	
Fundamentals of Control Systems	P. Marusak	45	103B-ARxxx-MSP-PODA	
Fundamentals of Control Systems	P. Marusak	45	103A-ARxxx-ISP-PODA	
Fundamentals of Information Technology	A. Wilkowski		1060-GI000-ISP-1004	for the Faculty of Geodesy and Cartography
Image and Speech Recognition	W. Kasprzak	60	103A-CTCSN-MSA-EIASR	
Implementation and Maintenance of IT Systems	A. Ratkowski	60	103A-INIOP-ISP-WUS	
Intelligent Robot Systems	C. Zieliński	45	103A-ARxxx-DSP-ISR	
Introduction to Management Systems	K. Pieńkosz	75	103A-INxxx-ISP-WSYZ	
Introduction to Robotics	W. Szynekiewicz	60	103B-ARxxx-MSP-WR	
Introduction to Robotics	W. Szynekiewicz	60	103A-ARxxx-ISP-WR	

Course Title	Lecturer	Hours per sem.	Course code	Notes
Mathematical Modelling	M. Kaleta	60	103A-INISY-MSP-MOM	
Microprocessor Systems in Process Control	P. Chaber	60	103B-ARxxx-ISP-SMS	
Modelling and Control of Manipulators	C. Zieliński	60	1130-EMARO-MSA-1002	for EMARO/Robotics programme
Modelling and Control of Robots	C. Zieliński	45	103A-ARxxx-DSP-MORO	
Numerical Methods	P. Marusak	60	103A-CTxxx-ISA-ENUME	
Numerical Methods	P. Tatjewski	45	103B-INxxx-ISP-MNUM	
Operating Systems	T. Kruk	60	103B-INxxx-ISP-SOI	
Optimization Algorithms and Methods	A. Krzemienowski	60	103B-ARxxx-DSP-AMO	
Parallel and Distributed Programming	E. Niewiadomska-Szyrkiewicz	60	103B-INISY-MSP-PORR	
Programmable Logic Controllers	J. Gustowski	45	103B-INSID-ISP-SP	
Programmable Logic Controllers	J. Gustowski	45	103C-ARxxx-MSP-SP	
Programming Fundamentals	M. Kaleta	60	103A-CTxxx-ISA-EPFU	
Programming Paradigms	M. Szlenk	45	103A-INxxx-ISP-PARP	
Real-time Systems	T. Kruk	75	1130-EMARO-MSA-1003	for EMARO/Robotics programme
Research Project	P. Pałka	60	103A-INISY-MSP-PBAD	
Robot Control and Simulation	T. Winiarski	60	103A-ARxxx-ISP-STERO	
Robot Control and Simulation	T. Winiarski	42	103B-ARxxx-MSP-STERO	
Robot Programming Methods	C. Zieliński	60	103A-INISY-MSP-ERPM	
Signal Processing	W. Kasprzak	45	1130-EMARO-MSA-1004	for EMARO/Robotics programme
Soft Computing in Process Control	M. Ławryńczuk	60	103A-ARxxx-MSP-SZAU	
Software Project Management	K. Pieńkosz	45	103D-INxxx-ISP-ZPI	
System Architecture and Integration	A. Ratkowski	45	103A-INxxx-MSP-AIS	
Team Project 1	M. Kaleta	60	103A-INxxx-ISP-PZSP1	
Team Project 2	I. Żółtowska	116	103A-INxxx-ISP-PZSP2	
Techniques for Social Network Analysis	P. Arabas	60	103A-INSID-MSP-TASS	
Unix System and TCP/IP Network Administration	J. Sobczyk	60	103B-INSID-ISP-ASU	

3.1.2 Spring

Course Title	Lecturer	Hours per sem.	Course code	Notes
Advanced Process Control Techniques	P. Tatjewski	60	103C-ARxxx-MSP-TAP	
Algorithms and Data Structures	A. Zalewski	90	103D-INxxx-ISP-AISDI	
Anatomy of Robots	T. Winiarski	45	103A-ARxxx-ISP-ANRO	

Course Title	Lecturer	Hours per sem.	Course code	Notes
Anatomy of Robots	T. Winiarski	45	103B-ARxxx-MSP-ANRO	
Artificial Intelligence	W. Kasprzak	45	1130-EMARO-MSA-2005	for EMARO/Robotics programme
Biometrics Authentication	M. Trokielewicz	45	103B-IBxxx-ISP-BIT	
Biometrics Authentication	M. Trokielewicz	45	114A-IBxxx-ISP-BIT	
Computer Networks	J. Sobczyk	60	103B-CTxxx-ISA-ECONE	
Computer Networks	J. Sobczyk	60	103C-INxxx-ISP-SKM	
Computer Systems for Control and Measurement	D. Seredyński	60	103A-INxxx-ISP-SKPS	
Computer Vision Techniques	A. Wilkowski	60	103A-INISY-MSP-TWM	
Cybersecurity – Social and Organization Security	A. Zalewski	60	103A-CBxxx-ISP-BESPO	
Data Stream Processing and Data Science	J. Granat	60	103A-INISY-MSP-PSD	
Databases	T. Traczyk	15	1060-GI000-ISP-2009	for the Faculty of Geodesy and Cartography
Databases and Data Warehouses	T. Traczyk	45	1050-FTEDM-MSP-1BHD	for the Faculty of Physics
DCS and SCADA Systems	S. Plamowski	60	103A-ARxxx-ISP-DCS	
Decisions under Risk	A. Krzemienowski	45	103B-INxxx-MSP-WDWR	
Diagnosis of Industrial Processes	S. Plamowski	45	103B-ARxxx-MSP-DIPR	
Diagnosis of Industrial Processes	S. Plamowski	45	103A-ARxxx-ISP-DIPR	
Discrete Optimization Methods	I. Żółtowska	45	103A-INISY-MSP-MOD	
Dynamic Systems and Control	R. Nebeluk		103A-CTxxx-ISA-EDYCO	
Engineering Prototyping in Automatic Control and Robotics	M. Ławryńczuk	60	103A-ARxxx-ISP-PIAR	
Essentials of Informatics and Programming	T. Śliwiński	75	103A-INxxx-ISP-PIPR	
Fundamentals of Operation Research	K. Pieńkosz	45	103B-ARxxx-ISP-POBO	
Identification Methods	P. Domański	45	103B-ARxxx-MSP-MI	
Implementation and Maintenance of IT Systems	A. Ratkowski	60	103A-INIOP-ISP-WUS	
Introduction to Automatic Control, Electronics and Telecommunication	P. Marusak	45	103A-INxxx-ISP-WAET	
Introduction to Management Systems	K. Pieńkosz	75	103A-INxxx-ISP-WSYZ	
Machine Perception	W. Kasprzak	60	103B-INSZI-ISP-PERM	
Mathematical Modelling	M. Kaleta	60	103A-INISY-MSP-MOM	
Microprocessor Systems in Process Control	P. Chaber	60	103B-ARxxx-ISP-SMS	
Microprocessor Systems in Process Control	P. Chaber	60	103C-ARxxx-MSP-SMS	
Mobile Robots	W. Szyrkiewicz	60	1130-EMARO-MSA-2004	for EMARO/Robotics programme
Modeling and Identification	M. Ławryńczuk	60	103B-ARxxx-MSP-MODI	
Modeling and Identification	M. Ławryńczuk	60	103A-ARxxx-ISP-MODI	

Course Title	Lecturer	Hours per sem.	Course code	Notes
Modelling and Computer Simulation	E. Niewiadomska-Szynkiewicz	60	103A-ARxxx-DSP-MISK	
Networked Intelligent Devices	M. Kamola	60	103A-INISY-MSP-SIU	
Numerical Methods	P. Tatjewski	45	103B-INxxx-ISP-MNUM	
Optimization Techniques	J. Granat	30	1130-EMARO-MSA-2008	for EMARO/Robotics programme
Parallel Numerical Methods	A. Karbowski	60	103A-CSCSN-MSA-EPNM	
Process Control	M. Ławryńczuk	60	103B-ARxxx-ISP-STP	
Process Control	M. Ławryńczuk	60	103C-ARxxx-MSP-STP	
Programmable Logic Controllers	J. Gustowski	45	103B-INSID-ISP-SP	
Programming Paradigms	M. Szlenk	45	103A-INxxx-ISP-PARP	
Reliable, Scalable and Maintainable IT Systems	T. Kruk	45	103A-INISY-MSP-ERSMS	
Research Project	P. Pałka	60	103A-INISY-MSP-PBAD	
Robot Programming Methods	C. Zieliński	60	1130-EMARO-MSA-2003	for EMARO/Robotics programme
Software Project Management	K. Pieńkosz	45	103D-INxxx-ISP-ZPI	
System Architecture and Integration	A. Ratkowski	45	103A-INxxx-MSP-AIS	
Team Project 2	I. Żółtowska	116	103A-INxxx-ISP-PZSP2	
Unix System and TCP/IP Network Administration	J. Sobczyk	60	103B-INSID-ISP-ASU	
Virtual Computation Environments	P. Arabas	45	103A-INISY-MSP-WSO	

3.2 Extramural Graduate Studies

Postgraduate studies **IT Resources Management: architectures, processes, standards, quality** are designed to provide students with current knowledge necessary for successful management of IT in modern organizations. The programme comprises: IT project management, quality standards and assurance systems, development methodologies, system testing, IT audit, business process modeling, system architectures and managerial skills. The classes take form of lectures, workshops, exercises and laboratories.

Postgraduate studies **Project Management: Standards, Practice, Techniques and Tools** merge theoretical knowledge with practical skills necessary for successful project management. The program encompasses: business case and project efficiency assessment, basic project management standards: PMBoK, PRINCE2, IPMA, specialized project management methods e.g. for IT (software development methods including agile approaches), automotive or construction industries, soft-skills like facilitation, negotiations, conflict management, public relations for project management, hard skills like project planning, scheduling, budgeting.

3.3 Graduate Distance Learning

Starting from academic year 2005/2006 our institute is involved in graduate distance learning programme of WUT (named **OKNO**). We coordinate two specializations: Engineering of Internet Systems and Decision and Management Support Systems. The graduates of the first one are prepared for designing, implementing and taking care of complex information technology and computing systems using possibilities offered by contemporary computer

networks. They have also ability to manage the layers of technology involved in the next generation of massive system deployments. The graduates of the latter are prepared for designing and implementing software systems which assist in managing, planning and decision making. Their skills and knowledge enable to manage the layers of technology involved in the new generation of intelligent systems empowering every aspect of business operations. First Ms.Sc. degree was awarded in the year 2008.

4 Projects

- [PR1] The Polish National Agency for Academic Exchange NAWA Grant No. BPN/BDE/2024/1/000044/DEC/1 **Twins for Household Autonomous Robots**

Granting period: 01-01-2025 31-12-2026.

Principal investigator: Artur Wilkowski. Investigators: Włodzimierz Kasprzak, Maciej Stefańczyk.

This project aims to advance intelligent household robots. Robotics technology can automate routine household tasks, allowing residents to focus on more productive or leisure activities, and expected to significantly improve the quality of life for elderly and disabled individuals.

Generation of digital twins of the real environments (simulation game-like model of the real environment), is an important computer vision processing step that facilitates semantic reasoning and goal understanding for robotic systems. Thus, intelligent behavior of such robotic systems relies on the digital twin generation step.

In this project, there is a focus on mesh-based reconstruction of articulated objects in the environment from RGB-D video data [1]. These are objects with interactable parts, e.g., a refrigerator or microwave that contain doors, check of drawers, etc. Generation of digital twin models of such objects will facilitate better planning and semantic reasoning of intelligent agents. The proposed research is being built on the recent developments of 3D gaussian splatting methods [2][3][4], which recently revolutionized novel-view synthesis of scenes captured with multiple photos or videos. The application of 3D language field [3] is explored that enables precise and efficient open vocabulary querying within 3D spaces towards building models of articulated objects for digital twin environments.

The long-term goal of the project is to develop methods that enable domestic robots to adapt swiftly to new home environments using SOTA deep learning scene perception approaches. Based on previous experiences, solutions are proposed to improve scene understanding and goal comprehension communicated by a user. Success indicators of this project include superior performance of the proposed approach compared to other state-of-the-art (SOTA) approaches reported for widely recognized benchmarks. The research results will be submitted to top-tier journals (IEEE, Frontiers, TMLR, etc.) and peer-reviewed conferences (NeurIPS, CoRL, ICRA, IROS, ICML, ICLR, etc.). This collaborative project will also support junior scientists through international collaboration and networking, and several Masters' and Engineers' theses' topics are proposed. During the collaboration, both research groups will seek opportunities to secure third-party funding for future research and build a community around this project, e.g. by organizing international workshops at leading conferences.

Keywords: intelligent home robots, service robots, digital twins, computer vision, 3D reconstruction, articulated objects, scene understanding.

- [PR2] Miniatura NCN Grant No. 2025/09/X/ST6/00901 **Trustworthy Artificial Intelligence for Software Architecture: Ethical dilemmas in using generative AI for architectural design**

Granting period: 13-11-2025 12-11-2026.

Principal investigator: Klara Borowa.

Aim of project: The project aims to conduct an initial empirical study on ethical dilemmas related to the use of generative artificial intelligence (GenAI) for software

architecture design as a first step towards building a trustworthy AI system for software architecture (TAI4SA). The main ethical dilemmas arising when using GenAI in architectural decision-making will be identified through interviews and questionnaires gathered from software practitioners and leading software architecture researchers. The study will be carried out in collaboration with researchers from Finland.

Expected results: The project is expected to yield a publicly available replication package with anonymised data on zenodo and a preprint on arXiv. A research article will also be submitted to a leading venue in software architecture or empirical software engineering.

Keywords: generative artificial intelligence, software architecture, ethics.

- [PR3] The Excellence Initiative Research University (IDUB), Grant No. 504/04496/1031/45. 050002 **iCampus WUT – development of a concept and pilot implementation of an IoT sensor system to support the creation and development of a smart WUT campus**
Granting period: 20–01–2025 30–06–2026.

Principal investigator: Piotr Pałka.

Investigators: Przemysław Korpas (WEiTI), Krzysztof Koszewski (WA), Robert Olszewski (WGiK), Sławomir Szostak (WEiTI), Agnieszka Wendland (WGiK), Żółtak-Dąbrowska (WA).

The objective of the project is to develop the concept, architecture, and functional assumptions of the “smart campus” system, iCampus WUT, and subsequently to implement it in a pilot deployment within the Main Campus of the Warsaw University of Technology. iCampus WUT will constitute an experimental, integrated network of intelligent devices designed both to collect and locally process data using IoT sensors operating in the edge-computing model, and to deliver multisensory information to members of the academic community. One of the key components of this infrastructure will be the so-called “smart lamp post”, equipped with a variety of sensors, actuators, and communication modules enabling cooperation with other devices within the system. This solution will support not only the monitoring of selected environmental and infrastructural parameters, but also the development of modern, interactive services enhancing the day-to-day functioning of the campus. An important assumption of the project is also to engage members of the Warsaw University of Technology community in the co-creation of the campus environment and in shaping directions for its further development. In this way, iCampus WUT will become not only a technological platform, but also a tool supporting participatory campus management and the development of innovative solutions that address the real needs of its users.

Keywords: IoT; Smart City; WUT Campus.

- [PR4] Scientific Council for the Discipline of Automatic Control, Electronics and Electrical Engineering and Space Technologies Grant No. 1031/RND/2/2025 **Task and Motion Planning for Service Robots**

Granting period: 07–07–2025 31–12–2026.

Principal investigator: Dawid Seredyński.

Investigator: Cezary Zieliński.

Aim of the project: The aim of the proposed project is to develop and validate a method for hierarchical task and motion planning for service robots that combines symbolic and geometric planning within a unified formalism. Task and motion planning is crucial for robots operating in dynamic and unsupervised environments, where the integration of high-level action planning with trajectory planning in continuous space is essential.

Defining the formalism using well-defined mathematical notation will make it possible to explore the topic in depth and present it to a wider audience. The main research challenge is the so-called 'semantic gap' between task planning (operating at the symbolic level) and motion planning (operating at the geometric level). The proposed approach assumes the use of a Hierarchical Task Network (HTN), extended with the PDDLStream formalism, which enables the generation of parameters at different ontological levels using streams, as well as the addition of a world model that serves as an intermediary between symbolic and geometric representations.

Keywords: hierarchical planning, task and motion planning, service robotics, manipulation.

- [PR5] Scientific Council for the Discipline of Automatic Control, Electronics and Electrical Engineering and Space Technologies Grant No. 1031/RND/1/2025 **Physics-guided neural networks and their application in advanced control algorithms**

Granting period: 07-07-2025 31-12-2026.

Principal investigator: Maciej Ławryńczuk. Investigator: Krzysztof Zarzycki.

The aim of the project is to develop a new structure of physics-guided neural networks and apply them in advanced control algorithms, especially in model predictive control algorithms. The considered models have a hybrid structure that includes both a neural component, trained using data sets and physical laws. They are used when the available data range is smaller than the process range. Keywords: neural networks, physics-guided neural networks, advanced control algorithms.

- [PR6] Commercial project for Valmet Automation No. 501210103557 **Assessment study including analysis of the performance of automatic control systems and identification of improvement potential for optimizing the combustion process for a coal-fired pulverized-fuel boiler operating at the EC3 Łódź: K6 CHP plant.**

Granting period: 09-10-2025 15-01-2026.

Principal investigator: Paweł Domański.

- [PR7] Warsaw University of Technology Centre for Priority Research Area Artificial Intelligence and Robotics YOUNG Grant No. 504/04496/1031/45. 010001: **Analysis of the properties of robotic system models expressed by hierarchical Petri nets.**

Granting period: 03.04.2023-26.07.2025.

Principal investigator: Maksym Figat

The aim of my research is to develop a method of analysis for robotic systems expressed by 6-layer RSHPN (Robotic System Hierarchical Petri Nets) to describe the activity of a robotic system. It describes the activity of: 1) agents, 2) subsystems, 3) subsystem tasks, 4) behaviours, 5) transition functions, 6) communication models used between pairs of subsystems. RSHPN has been designed to make its analysis for a specific model as simple as possible. As part of the work so far, I have developed a parameterised RSHPN metamodel from which an RSHPN model of the robotic system automatically emerges (after appropriate determination of model parameters).

The main goal of the project is to answer the question whether it is possible to prove the fulfilment of certain properties, e.g. no deadlock or safety, for the whole class of robotic systems emerging from the RSHPN metamodel by proving these properties for the RSHPN metamodel. In other words, whether the properties satisfied by the RSHPN metamodel are inherited by the emerging RSHPN models.

Based on the analysis methods developed, it may be necessary to specify in the generated RSHPN model the relevant network fragments for which the analysis has to be performed (e.g. network with a variable structure). For others, the properties would be guaranteed by the RSHPN metamodel. This would mean that when creating new robotic system models, the designer would be guaranteed properties for the majority of the system. For the remaining fragments of the system, the proposed analysis methods would have to be applied again, but we already know that these are extremely negligible fragments of the system. Ultimately, the tedious and very complex analysis of system properties would be omitted and the designer would be able to concentrate mainly on the most important aspects of the designed robotic system.

In my PhD thesis, I introduced a basic method for analysing RSHPN models and showed that the resulting decomposition of the RSHPN model into 6 layers, and subsequently into panels, greatly simplifies the process of verifying model properties (using reduction methods). With the proposed approach, the formal analysis of the RSHPN model is limited to the analysis of small parts of the system. If the designer ensures that the properties are satisfied for these parts of the system, then (thanks to the principle of inheritance of properties from the RSHPN metamodel) the whole system will also satisfy the above properties.

- [PR8] The Excellence Initiative Research University (IDUB), Grant No. 504/04496/1031/45. 110001 **Preparation and publication of a review article in a prestigious international journal**

Granting period: 07-08-2024 30-04-2025.

Principal investigator: Maciej Ławryńczuk. Investigator: Krzysztof Zarzycki.

Aim of the project: The project aims to conduct thorough literature studies and write a review journal article on the possible methods of using Long Short-Term Memory (LSTM) neural networks and their variants in Model Predictive Control (MPC). First, several model variants utilized in MPC are characterized. Next, possible approaches to MPC based on LSTMs are discussed and compared, particularly the MPC methods leading to low computational complexity. Stability and robustness issues are also discussed. Finally, numerous applications, including applications to real processes, hardware-in-the-loop solutions and example simulation studies, are reviewed.

Expected results: An accepted article for a prestigious international journal with a minimum score of 100 points, with the ultimate goal of 140+ points.

Keywords: Long Short-Term Memory neural network, Gated Recurrent Units neural network, recurrent neural network, Model Predictive Control.

- [PR9] The Excellence Initiative Research University (IDUB), Grant No. 504/00007/1031/45. 150001 **Design and deployment of a modular didactic offer in Requirements Engineering, supporting the interdisciplinary and international development of the team project courses conducted at the Faculty of Electronics and Information Technology**

Granting period: 01.11.2024 – 29.09.2025

Principal investigator: Izabela Żółtowska. Investigators: Klara Borowa, Marcin Szlenk, Izabela Żółtowska

Aim of the project: The aim of the project is to support the interdisciplinary and international development of team-based project activities through the development of new forms of active learning in requirements engineering. The main goal is to develop and introduce a new course in English, in a modular format, involving students in

a completely new role in the teaching process, co-responsible for the implementation of tasks by other students. The direct, dynamic interaction between participants in two courses (PZPS2 and ExT) is intended to simulate the real-world collaboration between the IT project team and the client. The proposed system is based on a teaching-by-examples and learning-by-doing approach, combined with role-playing and PBL methodology. Through the opportunity to collaborate with students from other faculties/universities, it exposes students to areas and skills from other disciplines, enabling them to communicate, utilize, and further develop their skills from a broader perspective, contributing to the potential of interconnected, interdisciplinary knowledge.

Expected results: The introduction of the new course will maximize the learning outcomes in terms of knowledge and skills, such as collaboration in an interdisciplinary team, demonstration and communication, requirements modeling and analysis, and team planning and management. The modular format of the newly developed ExT course will allow it to be included in the European Educational Pathways offerings of the ENHANCE+ program.

Keywords: PBL, team project, requirements engineering, innovative didactics

- [PR10] Scientific Council for the Discipline of Automatic Control, Electronics and Electrical Engineering Grant No. 504/04960/1031/43.022401 **Test platform for research on the security of digital twins of industrial processes**

Granting period: 25-04-2024 31-12-2025.

Principal investigator: Patryk Chaber. Investigator: Bartosz Chaber.

Aim of the project: Our aim is to prepare a test platform that will allow us to study methods of cyberattacks on digital twins and ways to protect them. Such a platform will allow for more extensive research on this topic in future projects. The level of detail in the model can range from relatively simple mathematical models to realistic, complex numerical models. The model we have developed will be based on the FEniCS library, which allows for the creation of fast and effective simulations using the finite element method. FEniCS is a proven computational package that generates efficient C++ code for solving fast simulation problems. However, a simpler model will be built first, created in the COMSOL Multiphysics environment. Both models will be based on the heat conduction equation and the convection equation.

Expected results: An accepted article for a journal with a minimum score of 100 points. We expect that in the second year of work, an application for a research grant financed from external sources will be submitted, in which we will be the leaders. Establishing international scientific contacts, which may result in joint publications or projects in the future.

Keywords: Digital Twin, Finite Element Method, Cybersecurity.

- [PR11] Research agreements with Sąd Okręgowy w Warszawie, Sąd Okręgowy w Lublinie, Sąd Okręgowy w Rzeszowie and Sąd Okręgowy w Krakowie: **Expert opinions on the information systems and services.**

Principal investigator: Andrzej Zalewski.

- [PR12] Rector's Grant No. 504440300176 **Kraken HackForce – Teams of innovators as the university's flagship**

Granting period: 16-09-2025 30-06-2026.

Principal investigator: Mariusz Kaleta.

Investigators: Karol Orzechowski, Jeremi Sobierski, Kacper Klassa, Jakub Kowieski, Maksymilian Łazarski, Wiktor Pytlewski, Julian Mossakowski, Radosław Kostrzewski, Julia Jodczyk, Julian Jarosz, Leon Woźniak (WEiTI) Natalia Nawrot, Zuzanna Koc, Łukasz Poplewski (WA) Adam Kuligowski (WSiMR) Szymon Warda (WE).

The primary objective of this project is to enhance students' design thinking and soft skills by supporting their participation in national and international hackathons, where they solve real-world challenges through prototyping and team collaboration. This initiative bridges the gap between academic theory and practical application, developing future-proof skills highlighted by the World Economic Forum, such as analytical thinking, creativity, and interdisciplinary teamwork. Furthermore, the grant strengthens Warsaw University of Technology's visibility and reputation within the global startup and innovation ecosystem.

5 Degrees Awarded

5.1 D.Sc. Degrees

Piotr Przemysław Arabas

Resource Allocation Control in Energy-Efficient Networks and Distributed Data Processing Systems

Thesis defended on Oct. 18, 2025

5.2 Ph.D. Degrees

Advisor: **Andrzej Zalewski**

Klara Borowa

Cognitive Biases in Architectural Decision-Making: Impact and Debiasing Strategies Thesis

Thesis defended on April 25, 2025

5.3 M.Sc. Degrees

Advisor: **P. Arabas**

H. Makuła (OKNO)

Symulacja heurystycznych, energooszczędnych algorytmów sterowania aktywnością węzłów periodycznej sieci sensorów

Degree awarded on March 2025

S. Mościcki

Mobilna stacja ładowania z funkcją śledzenia pozycji Słońca

Degree awarded on October 2025

Advisor: **P. Chaber**

J. Ostrzołek

Analiza wybranych języków programowania na systemy wbudowane pod kątem wydajności i niezawodności

Degree awarded on October 2025 (with honors)

Advisor: **P. Domański**

A. Daniel (OKNO)

Badanie przyczynowości na rynkach finansowych

Degree awarded on March 2025

H. Pisiecki

Evaluation of the Smart Alarming using Transfer Entropy and Causality Analysis

Degree awarded on June 2025

B. Gałecki

Statistical detection of outliers in stream data

Degree awarded on October 2025 (with honors)

P. Godlewski

Analiza i optymalizacja zużycia energii systemu HVAC

Degree awarded on October 2025

M. Kawałek

Analiza teoretyczna i rozwój regulatorów sic!PID

Degree awarded on October 2025

S. Wcisło

Statistical Methods in Vibration Analysis of Marine Diesel Engines

Degree awarded on October 2025

F. Kwaśnik

Wariantowa analiza przyczynowości w systemach wielopętlowych z wykorzystaniem wiedzy procesowej

Degree awarded on October 2025

Advisor: **W. Dudek**

M. Zembroń

Zdecentralizowany system zarządzania zadaniami dla zespołu robotów w misji poszukiwawczo-ratowniczej

Degree awarded on June 2025 (with honors)

Advisor: **J. Granat**

D. Wysocki

Declarative languages for stream data processing

Degree awarded on March 2025

M. Dudzisz

Uczenie przyrostowe sieci neuronowych w przetwarzaniu strumieniowym

Degree awarded on March 2025

M. Karol (OKNO)

Mikroserwisy odporne na awarie w przetwarzaniu danych strumieniowych

Degree awarded on March 2025

M. Jarosz

Detekcja anomalii systemu GPS z wykorzystaniem sieci neuronowych w procesie strumieniowego przetwarzania danych

Degree awarded on March 2025

H. Groen

Adaptacja modeli w czasie prawie rzeczywistym dla danych strumieniowych

Degree awarded on June 2025 (with honors)

M. Paluch

Analiza i strumieniowe przetwarzanie grafów dynamicznych

Degree awarded on October 2025

Advisor: **M. Kaleta**

S. Kwieciński (OKNO)

Zastosowanie modeli językowych GPT-4 do modelowania i rozwiązywania problemów opty-

malizacyjnych w systemach wspomagania decyzji

Degree awarded on March 2025

M. Paruzel (OKNO)

Zastosowanie programowania w ograniczeniach do optymalizacji tras łazików marsjańskich

Degree awarded on March 2025

D. Stalewski (OKNO)

Zastosowania grafowych sieci neuronowych do problemu wyznaczania tras z ograniczoną ładownością

Degree awarded on March 2025

Advisor: **M. Kamola**

M. Podstawski (OKNO)

Wykorzystanie grafowej organizacji wiedzy do poprawy rezultatów RAG (Retrieval Augmented Generation) dla tekstów narracyjnych

Degree awarded on March 2025 (with honors)

Advisor: **A. Karbowski**

A. Sharapa (OKNO)

Badania porównawcze różnych API do realizacji obliczeń numerycznych wykorzystujących karty graficzne

Degree awarded on March 2025 (with honors)

Advisor: **W. Kasprzak**

J. Matejczyk

Streszczenie polskich dokumentów sądowych za pomocą dużych modeli językowych

Degree awarded on October 2025

Advisor: **S. Kijas**

J. Zegarek (OKNO)

Porównanie protokołów komunikacyjnych Przemysłowego Internetu Rzeczy (IIoT)

Degree awarded on March 2025 (with honors)

K. Kwaśniewski (OKNO)

Zapewnienie natychmiastowej spójności danych w rozproszonych systemach IT

Degree awarded on March 2025 (with honors)

B. Krawczyk

Projekt bota do gier szachowych, analiza i implementacja wybranych algorytmów sztucznej inteligencji

Degree awarded on October 2025 (with honors)

W. Jóźwik (OKNO)

Analiza porównawcza środowisk uruchomieniowych JavaScript po stronie serwera w aplikacjach webowych

Degree awarded on October 2025 (with honors)

Advisor: **M. Ławryńczuk**

A. Samek

Badanie i analiza możliwości algorytmu SINDy do modelowania procesów dynamicznych oraz zastosowanie otrzymanych modeli w regulacji predykcyjnej

Degree awarded on June 2025

Advisor: **P. Marusak**

W. Rogalski

Zastosowanie modeli statyki typu Takagi-Sugeno z następnikami hiperbolicznymi w algorytmach regulacji predykcyjnej

Degree awarded on October 2025 (with honors)

K. Kamiński

Wykorzystanie neuronowo-rozmytych modeli Takagi-Sugeno z następnikami biliniowymi w regulacji predykcyjnej

Degree awarded on October 2025 (with honors)

Advisor: **E. Niewiadomska-Szynkiewicz**

A. Sypuła

Parallel framework for missing data completion

Degree awarded on June 2025 (with honors)

M. Kubiak

System wspomagania decyzji w diagnostyce neurologicznej

Degree awarded on October 2025

E. Reszka

Symulacja cyberataków na energooszczędną sieć WSN i metody detekcji ataków

Degree awarded on October 2025

Z. Filipkowska

Prognozowanie parametrów jakości węgla za pomocą metod sztucznej inteligencji

Degree awarded on October 2025

Advisor: **P. Pałka**

J. Szymanek

Harmonogramowanie zadań dla maszyn wytwarzania przyrostowego z wykorzystaniem aukcyjnych algorytmów wieloagentowych

Degree awarded on March 2025 (with honors)

R. Żurawski

Protokół przydziału zadań w heterogenicznym środowisku IoT przy ograniczeniach związanych z zarządzaniem energią

Degree awarded on June 2025

Advisor: **K. Pieńkosz**

J. Mazur

Wyznaczanie schematu pakowania elementów trójwymiarowych do pojemnika

Degree awarded on October 2025

Advisor: **S. Plamowski**

J. Kowalczyk

System wspierający zakup i cięcie stali

Degree awarded on January 2025

Advisor: **A. Ratkowski**

H. Nguyen (OKNO)

Procesy zarządzania zmianą na podstawie podejścia infrastruktura jako kod w narzędziu Terraform

Degree awarded on March 2025

W. Tarsa (OKNO)

Porównanie architektur, wydajności i zastosowań Apache Kafka i RabbitMQ w kontekście przetwarzania danych w czasie rzeczywistym

Degree awarded on June 2025

I. Anczykowski

Narzędzie do statycznej analizy kodu źródłowego wspomagające optymalizację serwisów wykorzystujących platformę Spring.

Degree awarded on June 2025

N. Gondek (OKNO)

Analiza porównawcza oraz ocena wdrożenia narzędzi wspierających procesy DevOps i zarządzanie cyklem życia oprogramowania

Degree awarded on October 2025

D. Górski

Porównanie architektury opartej na usługach komunikujących się synchronicznie z architekturą sterowaną zdarzeniami.

Degree awarded on October 2025

P. Rozwałka

Analiza porównawcza modeli wdrożeniowych w chmurze i wielokryterialne ramy wspomagania decyzji

Degree awarded on October 2025 (with honors)

Advisor: **A. Wilkowski**

K. Sołyga

Detekcja obiektów w sekwencjach obrazów pochodzących z różnych modalności

Degree awarded on March 2025

T. Kobylecki

Wizyjny system weryfikacji poprawnego parkowania

Degree awarded on March 2025

P. Ogonowska

Poprawa rozdzielczości i jakości obrazu IR na podstawie równolegle pozyskanych danych RGB

Degree awarded on October 2025

Advisor: **T. Winiarski**

A. Krawczyk

Symulacja robota TIAGo w środowisku O3DE pod ROS 2

Degree awarded on October 2025

J. Ostrowski

Platforma badawcza robota MiniRyś w zadaniu nawigacji roju robotów

Degree awarded on March 2025 (with honors)

Advisor: **I. Żółtowska**

M. Brzozowski

Wybrane modele i metody układania planu lekcji dla szkół podstawowych

Degree awarded on June 2025 (with honors)

K. Kozerski

Managing uncertainty in energy optimization models

Degree awarded on June 2025 (with honors)

Advisor: **A. Bąk**

J. Modzelewski (OKNO)

Optymalizacja routingu w sieci z wykorzystaniem protokołu BGP

Degree awarded on March 2025

Advisor: **R. Bembenik**

P. Szmurło

Opracowanie modelu decyzyjnego wyboru technologii mobilnych na podstawie porównania rozwiązań natywnych i wieloplatformowych

Degree awarded on June 2025 (with honors)

D. Łopatecki

Znajdowanie optymalnej lokalizacji dla prowadzenia działalności gospodarczej przy użyciu przestrzennych reguł asocjacyjnych i charakterystyki obszaru

Degree awarded on October 2025

Advisor: **P. Bilski**

P. Wojtiuk (OKNO)

Aplikacja www do przechowywania oraz przetwarzania danych geotechnicznych

Degree awarded on March 2025

Advisor: **P. Bobiński**

K. Latos (OKNO)

Aplikacja do prognozowania napadów padaczkowych na podstawie sygnałów EEG z wykorzysta-

taniem metod uczenia maszynowego

Degree awarded on March 2025

D. Kasierski (OKNO)

Bezpieczeństwo aplikacji internetowych z perspektywy zastosowanych wzorców projektowych

Degree awarded on March 2025

J. Róg (OKNO)

Optymalizacja kosztów BigQuery pod kątem procesów ETL/ELT w kontekście skalowalności przetwarzania danych

Degree awarded on June 2025

Ł. Pokrzywka (OKNO)

Bezpieczeństwo danych w środowiskach chmurowych: wyzwania i strategie ochrony informacji osobowych w kontekście aplikacji cloud-native oraz cloud-first

Degree awarded on June 2025

W. Inglot (OKNO)

Agile w sektorze IT: Analiza porównawcza i wybór metodyk projektowych

Degree awarded on October 2025

A. Sidor (OKNO)

Analiza i ocena bibliotek Selenium i Playwright w kontekście automatyzacji testów aplikacji webowych

Degree awarded on October 2025

R. Radziukiewicz (OKNO)

Zastosowanie modeli językowych AI do generacji strategii inwestycyjnych

Degree awarded on October 2025

R. Żelazo (OKNO)

Analiza wybranych rozwiązań Site Reliability Engineering (SRE) w kontekście projektowania skalowalnych aplikacji

Degree awarded on October 2025

Advisor: **M. Chwesiuk**

P. Popis (OKNO)

Integration of language models with detected real-time sign language hand gestures.

Degree awarded on March 2025

Advisor: **W. Daszczuk**

K. Faracik (OKNO)

Zastosowanie dowodów wiedzy zerowej w systemach głosowania opartych na technologii blockchain

Degree awarded on October 2025

Advisor: **K. Ignasiak**

E. Fiuk (OKNO)

Analiza porównawcza wytwarzania aplikacji mobilnych na przykładzie aplikacji planowania budżetu

Degree awarded on March 2025

Advisor: **K. Kamińska**

G. Kmita (OKNO)

Enhancing Threat Modeling with Large Language Models: Implementation and Assessment in OWASP Threat Dragon

Degree awarded on March 2025 (with honors)

P. Grzeszczuk (OKNO)

Badanie bezpieczeństwa systemu brzegowego automatyki przemysłowej

Degree awarded on March 2025

M. Rus (OKNO)

Badanie strategii omijania wykrycia przez oprogramowania antywirusowe oraz metod persistencji w systemie - perspektywa red team

Degree awarded on March 2025

Advisor: **K. Kukielka**

B. Jakielski

Analiza możliwości akwizycji danych z kontrolera robotów przemysłowych firmy Fanuc oraz analiza danych w kierunku wykrywania cyberataków.

Degree awarded on October 2025

Advisor: **W. Kuśmirek**

J. Stobnicki (OKNO)

Analiza wartości prądów z sekwenatora nanopore

Degree awarded on March 2025

Advisor: **K. Madziar**

M. Biela (OKNO)

Zagadnienie analizy, projektowania, implementacji i testów aplikacji webowych o architekturze mikroserwisowej

Degree awarded on June 2025

K. Musz (OKNO)

Projektowanie i wybór architektury aplikacji internetowych w kontekście długoterminowego utrzymania oraz jakości wytworzonego oprogramowania.

Degree awarded on June 2025

A. Rojek (OKNO)

Automatyzacja zarządzania infrastrukturą za pomocą narzędzia Terraform oraz proces wdrażania aplikacji w platformie chmurowej AWS

Degree awarded on June 2025

K. Macko (OKNO)

Analiza porównawcza historycznych i współczesnych algorytmów kryptograficznych

Degree awarded on October 2025

Advisor: **T. Martyn**

F. Nachawati (OKNO)

Efektywność dużych modeli językowych (LLM) w generowaniu dokumentacji i quizów opartych na jej podstawie

Degree awarded on October 2025

Advisor: **J. Misiurewicz**

A. Shmyk

Estimation of satellite orbital parameters from Doppler measurements with Software Defined Radio

Degree awarded on March 2025

Advisor: **M. Modrzejewski**

M. Falkowski (OKNO)

Machine learning framework for explainable artificial intelligence audio models

Degree awarded on October 2025

M. Wasilewski

Assessment of software complexity using code metrics and Large Language Models

Degree awarded on October 2025 (with honors)

Advisor: **M. Nałęcz**

D. Nalazek (OKNO)

Wykrywanie w śladzie aerodynamicznym turbulencji o częstotliwościach infradźwiękowych z wykorzystaniem głębokich sieci neuronowych

Degree awarded on March 2025

Advisor: **R. Nowak**

J. Winter

Automatyczne wyznaczanie chłonności działki budowlanej przy użyciu heurystycznych algorytmów przeszukiwania przestrzeni

Degree awarded on October 2025

Advisor: **R. Podraza**

K. Cedro (OKNO)

Porównanie architektury monolitycznej i mikroserwisów na przykładzie aplikacji w języku Java

Degree awarded on March 2025

D. Szpunar (OKNO)

Analiza i optymalizacja zarządzania aplikacjami kontenerowymi w chmurze publicznej przy użyciu Kubernetes

Degree awarded on March 2025

M. Tarka (OKNO)

Analiza i porównanie wydajności aplikacji w Javie korzystających z wątków wirtualnych i programowania reaktywnego

Degree awarded on March 2025

R. Tomaszewski (OKNO)

Porównanie wydajności rozwiązań low-code oraz klasycznego programowania na przykładzie

platformy Salesforce i aplikacji w architekturze mikroserwisowej

Degree awarded on March 2025

O.Żarowska (OKNO)

Comparison of the use of REST and GraphQL technologies in Internet systems

Degree awarded on June 2025

K. Adameczek (OKNO)

Badanie wydajności systemu przetwarzania danych typu „no-code” w porównaniu do rozwiązań opartych o języki SQL i Python

Degree awarded on October 2025 (with honors)

M. Beśka (OKNO)

Porównanie technologii SignalR i gRPC w aplikacjach internetowych opartych na .NET i Angular

Degree awarded on October 2025

Advisor: **G. Protaziuk**

W. Sikora (OKNO)

Predykcja cen nieruchomości

Degree awarded on October 2025

D. Herc (OKNO)

Metody generowania zmian w zapytaniach w celu uzyskania lepszych wyników wyszukiwania.

Degree awarded on October 2025

Advisor: **K. Radlak**

Z. Pudo (OKNO)

Zastosowanie aktywnego uczenia do problemu detekcji obiektów

Degree awarded on March 2025

Advisor: **P. Rokita**

J. Krupiński

Application of artificial intelligence in digital image analysis for robotics

Degree awarded on March 2025 (with honors)

Advisor: **Ł. Skonieczny**

K. Starowiejski (OKNO)

Analiza porównawcza typów baz danych

Degree awarded on October 2025

Advisor: **T. Trzcíński**

M. Stawik-Kilian

Segmentacja naczyń krwionośnych łożyska w zespole przetoczenia krwi między bliźniętami ucząc na filmach wideo wraz z pseudo-etykietami

Degree awarded on October 2025

Advisor: **Z. Wawrzyniak**

A. Wąs (OKNO)

Zaawansowane strategie wdrożeń ciągłych Blue-Green i Canary dla aplikacji biznesowych klasy ERP

Degree awarded on March 2025

J. Oleksiuk (OKNO)

Zabezpieczenie komunikacji aplikacji internetowej protokołem WebSocket

Degree awarded on March 2025 (with honors)

B. Starzyk (OKNO)

Analiza porównawcza wykorzystania narzędzi automatyzacji testów do systematycznego monitoringu serwisów sieciowych

Degree awarded on March 2025 (with honors)

J. Kochański (OKNO)

Implementacja algorytmu równoważenia obciążenia w architekturze rozproszonej

Degree awarded on October 2025 (with honors)

Advisor: **M. Ziembicki**

H. Zajączkowski (OKNO)

System plików z uwierzytelnieniem biometrycznym dla kart SD w systemach mikroprocesorowych

Degree awarded on October 2025 (with honors)

5.4 B.Sc. Degrees

Advisor: **P. Arabas**

Z.Godek

Filtr pakietów wykorzystujący pakiet DPDK

Degree awarded on February 2025

Advisor: **K. Borowa**

K.Mielęcka

System zapisów na zajęcia językowe - z wykorzystaniem algorytmów optymalizacji do tworzenia planu zajęć

Degree awarded on February 2025

M. Kindeusz

System dla organizacji pozarządowej wspierającej uchodźców

Degree awarded on February 2025

P. Zdziech

System do udostępniania ofert zajęć tanecznych

Degree awarded on September 2025

Advisor: **P. Chaber**

A. Makowski

Czytnik PDF ze stabilizacją obrazu - stabilizacja wyświetlanego obrazu w oparciu o podstawowe

czujniki urządzeń mobilnych

Degree awarded on February 2025

P. Michalczewski

Stanowisko do badań transferu ciepła w układzie regulacji

Degree awarded on February 2025

A. Rybojad

Platforma Mobilna- projekt i wykonanie obrotowo-uchylnej wieży czołgowej

Degree awarded on June 2025

M. Wewiór

Projekt i wykonanie automatycznego stroika wielokanałowego do gitary elektrycznej

Degree awarded on June 2025

S. Spaczyński

Projekt i budowa układu regulacji w postaci odwróconego wahadła z wykorzystaniem platformy mobilnej

Degree awarded on September 2025

M. Zelwak

Projekt i wykonanie planszy do gry w szachy wspierającej początkowych graczy

Degree awarded on September 2025

D. Młynarska

Projekt i wykonanie oprogramowania do rozwiązywania i generacji japońskich łamigłówek logicznych

Degree awarded on September 2025

Advisor: **P. Domański**

P. Płoski

Optymalizacja dynamiczna sieci dystrybucyjnej typu "Last Mile"

Degree awarded on February 2025

K. Radzikowski

Opracowanie modelu agentowego sieci dystrybucyjnej typu "Last Mile"

Degree awarded on February 2025 (with honors)

Advisor: **J. Gustowski**

A. Woś

System do automatycznego sterowania warunkami w terrariach dla zwierząt egzotycznych

Degree awarded on June 2025

J. Cholewiński

Aplikacja internetowa do wyszukiwania leków

Degree awarded on September 2025

K. Piątek

Implementacja złożonych przemieszczeń obiektów graficznych na panelu HMI KTP700

Degree awarded on September 2025

Advisor: **S. Kijas**

Z. Damszel

Projekt oraz implementacja aplikacji mobilnej przeznaczonej do rozpoznawania gatunków

grzybów na podstawie obrazów.

Degree awarded on February 2025

K. Fijałkowski

Projekt i realizacja systemu do zgłaszania usterek w lokalach mieszkalnych

Degree awarded on February 2025

Advisor: **A. Krzemienowski**

M. Kowalewski

Walidacja modeli statystycznych dla portfeli inwestycji z ryzykiem mierzonym ekspektylową wartością zagrożoną

Degree awarded on February 2025

W. Grunwald

Optymalizacja portfela w warunkach niejednoznaczności z ryzykiem mierzonym ekspektylową wartością zagrożoną

Degree awarded on February 2025

Advisor: **M. Ławryńczuk**

M. Chomanski

Konstrukcja i sterowanie robota trójkątowego

Degree awarded on February 2025 (with honors)

N. Iwańska

Opracowanie biblioteki do efektywnego uczenia dynamicznych modeli neuronowych typu GRU

Degree awarded on February 2025

P. Kluba

Efficient generation of surrogate models for Formula Student reccecar's aeromaps

Degree awarded on February 2025

Advisor: **P. Marusak**

D. Bartosiak

Oprogramowanie wspomagające projektowanie rozmytych regulatorów predykcyjnych

Degree awarded on February 2025 (with honors)

A. Czubak

Oprogramowanie symulujące i optymalizujące działanie regulatorów na podstawie wybranych kryteriów regulacji

Degree awarded on February 2025

Advisor: **E. Niewiadomska-Szynkiewicz**

M. Ładyżyński

Metody uczenia maszynowego do wykrywania artefaktów w zapisach rezonansu magnetycznego mózgu

Degree awarded on February 2025

R. Cendrowski

Wykrywanie i klasyfikacja emocji w tekście z wykorzystaniem metod uczenia maszynowego

Degree awarded on September 2025

Advisor: **R. Nebeluk**

K.Dul

Projekt i budowa pojazdu typu Line Follower z efektywnym układem sterowania umożliwiającym precyzyjny przejazd pojazdu po danej trasie

Degree awarded on February 2025

K. Piszczela

Efektywny układ sterowania quadcopterem w zadaniu dostarczania przesyłek

Degree awarded on September 2025

Advisor: **P. Pałka**

M.Czech

Aplikacja służąca do kojarzenia grup osób na wspólne spacerzy z psem

Degree awarded on June 2025

Advisor: **S. Plamowski**

M. Wójcik

Ocena jakości pracy układów regulacji na przykładzie rzeczywistego obiektu laboratoryjnego

Degree awarded on January 2025

B. Bąbolewski

Algorytmy automatycznego strojenia regulatorów PID działających w strukturze MFC

Degree awarded on September 2025

Ł. Nowaczyński

Implementacja algorytmów sterowania na mikrokontrolerze

Degree awarded on September 2025

Advisor: **A. Ratkowski**

B. Kisły

Mikroserwisowa aplikacja webowa do zarządzania i analizy budżetu z wykorzystaniem generatywnej sztucznej inteligencji

Degree awarded on February 2025 (with honors)

J. Woźniak

Aplikacja do zarządzania i monitorowania fotowoltaiką dla gospodarstw domowych

Degree awarded on February 2025

K. Lipski

Aplikacja do planowania gier zespołowych ZNAJDŹ GRĘ. Aplikacja przeglądarkowa oraz predykcja i system rankingowy

Degree awarded on September 2025

M. Pakulski

Aplikacja szachowa do rozgrywek na ślepo (blindfold chess) z możliwością gry z botami i innymi graczami

Degree awarded on September 2025

Advisor: **D. Seredyński**

J. Wasilewska

Ocena możliwości sterowania manipulatorem robota w zadaniu odbijania piłeczki do ping ponga

Degree awarded on February 2025

P. Dąbrowska

Projekt i implementacja systemu sterowania manipulatora mobilnego na przykładzie łazika marsjańskiego

Degree awarded on September 2025

Advisor: **M. Stefańczyk**

T. Owienko

Analiza zdjęć lotniczych i satelitarnych na potrzeby sytuacji nadzwyczajnych

Degree awarded on February 2025 (with honors)

M. Kowalczyk

Geolokalizacja na podstawie zdjęć satelitarnych i ujęć z poziomu ziemi

Degree awarded on June 2025

Advisor: **M. Szlenk**

A. Kruk

Narzędzie konwersji plików XMI do języka PlantUML

Degree awarded on February 2025

P. Stachyra

System zbierania i prezentowania opinii porównawczych

Degree awarded on September 2025

B. Niewiarowski

System usprawniający proces składania i obsługi zamówień w sklepie budowlanym

Degree awarded on September 2025

Advisor: **W. Szyrkiewicz**

S. Kołodziejczyk

Nawigacja drona z wykorzystaniem głębokiego uczenia ze wzmocnieniem

Degree awarded on February 2025

J. Cimochoński

System mikrokomputerowy do rejestracji danych z przebiegu trasy oraz parametrów technicznych w pojazdach samochodowych

Degree awarded on February 2025

J. Rusak

Sterownik z mikrokomputerem Raspberry Pi dla robotów modułowych LEGO Mindstorms

Degree awarded on June 2025

Advisor: **T. Winiarski**

B. Niemiec

Robot mobilny w roli przewodnika

Degree awarded on September 2025

F. Szyszek

Sterownik robota Dobot Magician oparty o ROS 2 Jazzy

Degree awarded on September 2025

Advisor: **A. Wojtulewicz**

J. Kierasiński

Opracowanie systemu wbudowanego z mikrokontrolerem dla systemu akwizycji i wizualizacji danych z samochodu w oparciu o DoIP

Degree awarded on February 2025

S. Michalski

Projekt i implementacja systemu sterowania numerycznego dla tokarki z wykorzystaniem sterownika Mitsubishi M80V

Degree awarded on February 2025

M. Sobaś

Hamownia dla silnika nitro używanego w modelach RC

Degree awarded on February 2025

Advisor: **A. Zalewski**

J. Jóźwiak

Przegląd i porównanie technologii Infrastructure as Code

Degree awarded on September 2025

Advisor: **K. Zarzycki**

M. Ciupak

Rekurencyjne sieci neuronowe w modelowaniu i regulacji predykcyjnej

Degree awarded on February 2025

P. Krzyczkowski

Konstrukcja i regulacja stanowiska laboratoryjnego

Degree awarded on February 2025

P. Kutyla

Integracja modelowania stanowiska laboratoryjnego i regulacji predykcyjnej z uczeniem maszynowym oraz praktykami MLOps i DevOps

Degree awarded on September 2025

Advisor: **I. Żółtowska**

B. Kowalski

Aplikacja do projektowania i organizacji kursów edukacyjnych z funkcją analizy postępów

Degree awarded on February 2025

Advisor: **P. Bilski**

J. Lemański

Zastosowanie technik uczenia maszynowego do predykcji wyników oraz zdarzeń podczas meczów piłkarskich

Degree awarded on June 2025

Advisor: **J. Chudziak**

F. Bańka

AI Architectures for Option Pricing and Portfolio Management: From Transformers to Multi-Agent Systems

Degree awarded on September 2025

Advisor: **J. Jasiński**

K. Kośnik

Opracowanie i realizacja zintegrowanego systemu pomiarowo-kontrolnego w postaci przenośnego mikropotencjostatu na potrzeby badań woltamperometrycznych

Degree awarded on February 2025

P. Dąbrowski

Sprzętowo-programowa realizacja systemu do pomiaru prędkości łodzi z wykorzystaniem mikromechanicznych czujników położenia i przemieszczenia kąтового z uwzględnieniem poprawek GNSS bazujących na obserwacjach dwuczęstotliwościowych.

Degree awarded on February 2025

Advisor: **G. Kasprowicz**

I. Mermer

Implementacja oraz wdrożenie platformy ALFRED w laboratorium detektora ALICE – FIT

Degree awarded on September 2025

Advisor: **G. Protaziuk**

J. Macuga

Aplikacja interaktywna tablica do współpracy online

Degree awarded on June 2025

Advisor: **K. Radlak**

D. Wszyńska

Zastosowanie metod uczenia maszynowego do rozpoznawania emocji na zdjęciach

Degree awarded on February 2025 (with honors)

W. Pobocho

Projekt i implementacja algorytmu detekcji pasa ruchu dla autonomicznych pojazdów

Degree awarded on September 2025

Advisor: **P. Rokita**

F. Wroński

Analiza funkcji błędu modeli rekonstrukcji nadrozdzielczej obrazów opartych na głębokich

sieciach neuronowych

Degree awarded on February 2025

F. Szczygielski

Analiza danych finansowych z wykorzystaniem klasycznych technik przetwarzania sygnałów oraz metod uczenia maszynowego

Degree awarded on February 2025

Advisor: **S. Szostak**

A. Moszczyński

Opracowania i weryfikacja systemu sterowania stanowiskiem do otrzymywania cienkich warstw techniką osadzania z fazy gazowej

Degree awarded on February 2025

Advisor: **P. Wieczorek**

A. Sieruga

Praca utajniona

Degree awarded on February 2025 (with honors, praca utajniona)

6 Publications

6.1 Scientific or Technical Books

- [B1] P. Domański, *Back to Statistics Tail-Aware Control Performance Assessment*, 1st ed. ISBN 9781032671741, 332 p, 2025.
- [B2] A. Mazur and C. Zieliński, Eds., *Postępy Robotyki*. Oficyna Wydawnicza Politechniki Wrocławskiej, ISBN: 978-83-7493-910-2, 2025.
- [B3] C. Zieliński, J. Arabas, D. Belter, W. Kasprzak, Z. Kowalczyk, M. Ławryńczuk, M. Malinowski, A. Mazur, W. Mazurczyk, E. Niewiadomska-Szynkiewicz, D. Pazderski, P. Skrzypczyński, M. Sochacki, J. Szmidt, P. Szynkarczyk, W. Szynkiewicz, J. Wrona, and T. Zielińska, *Autonomia robotów pola walki i robotów specjalnego przeznaczenia*. Sieć Badawcza Łukasiewicz – Instytut Technologii Eksploatacji, ISBN: 978-83-7789-788-1, 219 p., 2025.

6.2 Scientific and Technical Papers in Books and Conference Proceedings

- [C1] R. A. Bhuiyan, M. Trokielewicz, P. Maciejewicz, S. Bucher, and A. Czajka, “Iris recognition for infants”, in *2025 IEEE/CVF Winter Conference on Applications of Computer Vision Workshops WACVW 2025, 28 February - 4 March 2025 Tuscon, USA*. Institute of Electrical and Electronics Engineers, 2025, p. 83–92.
- [C2] K. Borowa, R. Rebouças de Almeida, and M. Wiese, “Debiasing architectural decision-making: An experiment with students and practitioners”, in *Proceedings 2025 IEEE 22nd International Conference on Software Architecture ICSA*. Institute of Electrical and Electronics Engineers, 2025, p. 210–220.
- [C3] B. Chaber and P. Chaber, *A Digital Model of a Ventilation System for Anomaly Detection*, 2025 Progress in Applied Electrical Engineering (PAEE), Koscielisko, Poland, 2025, pp. 1–4
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