

Włodzisław Duch - Curriculum Vitae



August 2010; this document [in PDF](#).

- [Academic Genealogy](#)
- [Address and personal](#)
- [Computer experience](#)
- [Conferences and schools](#)
- [Education and degrees](#)
- [Invited talks](#)
- [Journals and associations](#)
- [Major grants](#)
- [Positions held](#)
- [Publications](#)
- [Research Fields](#)
- [Teaching Experience](#)

Office address Katedra Informatyki Stosowanej (Department of Informatics), Wydział Fizyki, Astronomii i Informatyki Stosowanej (Faculty of Physics, Astronomy and Informatics)
 Uniwersytet Mikołaja Kopernika (Nicolaus Copernicus University)
 ul. Grudziadzka 5, 87-100 Toruń, Poland
 E-mail id: wduch, on the server is.umk.pl
 WWW: Google "Duch" or type <http://www.is.umk.pl/~duch>
 Tel: (48-56) 622 1543 or 611-3267; Fax: (48-56) 622 1543

Home address ul. Koniuchy 11B/37
 87-100 Toruń, Poland

Personal data Born: 27 July 1954, in Kwidzyn, Poland
 Nationality: Polish
 Married: 18.04.1976, with Maria Wisniewska
 Children: Jakub born 1978; Alicja born 1980

Sex: male

Education, degrees and titles

- 1997 Title of a "professor of theoretical physics and informatics"
- 1987 Habilitation (D.Sc.) in many body physics. Thesis title: *Graphical representation of model spaces*, published by Springer Verlag, Berlin (1986); thesis won the Ministry of Education Award.
- 1980 PhD in quantum chemistry. Thesis title: *Direct Configuration Interaction Method* (Ministry of Education Award granted in 1981). Thesis advisor: Prof. dr hab. Jacek Karwowski.
- 1977-1980 Graduate study in quantum chemistry at the Nicolaus Copernicus University, Torun, Poland.
- 1977 Master of Science diploma (highest honors, "blue diploma").
- 1972-1977 Undergraduate study in physics at the Nicolaus Copernicus University, Torun, Poland.

[Academic Genealogy](#)

Positions held (one month or longer only)

- 2010-2012 Nanyang Visiting Professor, Nanyang Technological University, School of Computer Engineering, Department of Computer Science, Singapore.
- 2004-2007 Visiting Professor, Nanyang Technological University, School of Computer Engineering, Department of Computer Science, Singapore (6 month each year).
- 2003 Senior Fellow, Nanyang Technological University, School of Computer Engineering, Department of Computer Science, Singapore (sabbatical).
- 2001-2002 President, Executive Board of the Kopernik.pl company (March 2001, the company existed till the end of 2002).
- 2000-now Professor Ordinarius (Profesor zwyczajny), Nicolaus Copernicus University (UMK), head of the [Department of Informatics, Torun](#), Poland; teaching, research, administration, member of countless committees.
- 1998-now President, DuchSoft research and development company.
- 1990-1999 Associate Professor (Profesor Nadzwyczajny), Nicolaus Copernicus University (UMK), head of the [Department of Computer Methods, Torun](#), Poland; teaching, research, administration, member of countless committees.
- 1996-2001 Visiting Scientist, [Max-Planck-Institut für Astrophysik](#) (MPA), Garching b. München, Germany; 1-2 month each year, research.
- 2000 Visiting Professor, [Meiji University, Department of Computer Science](#), Kawasaki, Tokyo, Japan; 1 month, research.
- 1997 Visiting Scientist, [Max-Planck-Institut für Psychological Research](#) (MPPF), München, Germany; 1 month, research.
- 1997 Visiting Professor, [LSIIT, Artificial Intelligence Department](#), Louis Pasteur Universite, Strasbourg, France, 1 month, research.
- 1996 Senior Research Fellow, [Kyushu Institute of Technology](#), Faculty of Computer Science and Systems Engineering, Iizuka, Fukuoka, Japan; 3 month, research.
- 1995 Visiting Scientist, [Center for Neural Networks](#), King's College, London, and IUT, Université de Champagne, Reims, France, research.
- 1994 Senior Research Fellow, [Rikkyo University](#), Department of Chemistry, Tokyo, Japan; 3 month, research.
- 1992-1994 Visiting Scientist, Max-Planck-Institut für Astrophysik (MPA), Garching b. München, Germany; 2 month each year, research.
- 1992 Visiting Professor, [Department of Chemistry](#), University of Alberta, Edmonton, Canada; 1 month, research.
- 1991 Visiting Professor, Department of Chemistry, University of Alberta, Edmonton, Canada; 5 weeks, research.
- 1990 Visiting Professor, [Quantum Theory Project](#), University of Florida, Gainesville, Florida; 6 weeks, research.
- 1989-1991 Visiting Scientist, Max-Planck-Institut für Astrophysik (MPA), Garching b. München; 3 month each year, research.
- 1988 Visiting Professor, Department of Chemistry, [University of Southern California](#), Los Angeles, California; 1.5 month, research.
- Visiting Scientist, Max-Planck-Institut für Astrophysik (MPA), Garching b. München; 1.5 month, research.
- 1988-1991 Vice-president for computing, Nicolaus Copernicus University.
- 1988-1990 Associate Professor (Docent), Nicolaus Copernicus University, Institute of Physics, Torun, Poland; teaching, research, administration.
- 1987 Visiting Scientist, Institute of Theoretical Physics, Stockholm University, Stockholm, Sweden; 1 month, research; Visiting Scientist, MPA; 3 month, research.
- 1985-1987 Alexander von Humboldt Fellow, MPA. Max-Planck-Institut für Astrophysik (MPA), Garching b. München, Germany; 1.5 years, research.
- 1984-1988 Adiunkt (Assistant Professor), Institute of Physics, Nicolaus Copernicus University, Torun, Poland; teaching and research.
- 1984 Visiting Scientist, Max-Planck-Institut für Astrophysik (MPA), Garching b. München, Germany; 3 months, research.
- 1982-1984 Starszy Asystent (Senior Assistant), Institute of Physics, Nicolaus Copernicus University, Torun, Poland; teaching and research.
- 1980-1982 Postdoctoral fellow, Department of Chemistry, [University of Southern California](#) (USC), Los Angeles, California; 2 years, research.
- 1980 Asystent (Teaching Assistant), [Institute of Physics, Nicolaus Copernicus University](#), Torun, Poland; teaching and research.

Journals - editorial boards

1. [Behavioral and Brain Sciences](#) (BBS) associate, since 2003
 2. [Cognitive Neurodynamics](#) (Springer), since 2006
 3. [Cognitive Science and Media in Education](#), scientific secretary, since 1998
 4. [Computer Physics Communications](#) (Elsevier, North Holland), Special Editor (1994-2007)
 5. [IEEE Transactions on Neural Networks, books and media editor](#), appointed 2000, 2002, 2004, 2006-2008 ([list of reviews](#))
 6. [International Journal of Computational Intelligence](#), editor, since 2004
 7. [International Journal of Information Technology and Intelligent Computing](#), editor, since 2006
 8. [International Journal of Neural Systems](#) (IJNS), World Scientific, Editorial Advisory Board 2005
 9. [International Journal of Signal Processing](#), editor, since 2004
 10. [International Journal of Transpersonal Studies](#), editor, since 2001
 11. [Journal of Artificial General Intelligence](#) (JAGI), starting in 2008
 12. [Journal of Mind and Behavior](#), assessing editor, since 2002
 13. [Journal of Artificial Intelligence and Soft Computing Research](#), since 2009
 14. [Machine Graphics and Vision](#), since 2003
 15. [Neural Information Processing Letters and Reviews](#), since 2003
 16. [Nonlinear Biomedical Physics](#), Open Access journal (BioMed Central, London), since 2006
17. Handbook of Natural Computing: Theory, Experiments, and Applications, Springer, advisory board, since 2008

Professional associations

- European Union COST Action BM0605: Consciousness: A Transdisciplinary, Integrated Approach, since 2008.
 - EU COST Action BM601 [Neuromath](#), Advanced Methods for the Estimation of Human Brain Activity and Connectivity, since 2007.
 - EU COST Action B27 [Electric neuronal oscillations and cognition \(ENOC\)](#) working group, 2006-08.
 - EU COST IntelliCIS (Intelligent Monitoring, Control and Security of Critical Infra-structure Systems) Action IC0806, 2009.
 - [EUCog II](#) - 2nd European Network for the Advancement of Artificial Cognitive Systems, Interaction and Robotics.
 - European Union expert in the 6th Framework Program in the "Life Sciences" panel, 2003-05.
 - European Union expert in the 5th Framework Program in the "Life Sciences" panel, Marie Curie program, 2000-02.
 - [Polish Committee of Scientific Research](#), reviewer for VIII (1994), IX (1995), X (1996) call, section (T11E) "Medical Technologies"
 - Reviewer of the Polish [Ministry of Education](#) (since 1994-now)
- [Association for Computing Machinery](#) (ACM) individual member since 1990.
 - [European Neural Network Society](#); President 2006-2008, second term 2009-2011; President-elect 2005; member of the executive committee 2001-2004; individual ENNS member since 1993.
 - [European Physical Society](#), individual member since 1984.
 - [IEEE](#) Senior Member since 2002, Member since 1997.
 - [IEEE Computational Intelligence Society](#), CIS Technical Committee member since 2003
 - [IEEE Neural Network Society](#) (previously NN Council), active member since 6/1997, [current NN Technical Committee](#) and previous [NNTC](#) member
 - [International Neural Network Society](#); INNS Board of Governors member, 2003.
 - [International Brain Research Foundation Scientific Advisors](#).
 - [Lifeboat Foundation](#) Scientific Advisory Board
 - [Open Systems and Information Dynamics Society](#) (former "Polish-Japanese-Italian Society"; member of the board, 1992-1995 and 1999-2003 (elections are every year).
- Polish Academy of Sciences, Computational Physics Section, Sekcja Fizyki Obliczeniowej. Founding member (1997), vice-president (2001).
 - Polish Academy of Sciences, Committee on Automatics and Robotics, Neural Networks and Fuzzy Logic, Sekcja Automatyki, Robotyki, Sieci Neuronowych i Logiki Rozmytej, member (since 2000).
 - Polish Academy of Sciences, Komitet Informatyki, Sekcja Nauk Obliczeniowych (Computational Science Section), member of the board, 2009-2010.
 - Polish Academy of Sciences, [Komitet Neurobiologii](#) (Committee of Neurobiology), member of the board, 2007-2010.
 - Polish Chemical Society; Quantum Chemistry section, Sekcja Chemii Kwantowej, 1980-1990.
 - [Polish Cognitive Science Society](#), Polskie Towarzystwo Kognitywistyczne; founding member, on the executive board 2002-2004.
 - [Polish Neural Network Society](#), Polskie Towarzystwo Sieci Neuronowych; founding member, on the board since 1995.
 - [Polish Artificial Intelligence Society](#); Polskie Stowarzyszenie Sztucznej Inteligencji, on the scientific board since 2010.
 - [Polish Physical Society](#), Polskie Towarzystwo Fizyczne; member since 1977, secretary of the Torun chapter 1989-91; member of the board 1988-1992.
 - Polish Transpersonal Society, Polskie Towarzystwo Transpersonalne; founding member 1993.
 - [Societas Humboldtiana Polonorum](#), member since 1993.
 - Nicolaus Copernicus University, member of the professors club, since 2001.
- [SRM Deemed University](#), Chennai, India, member of the International Advisory Board, since 2004.
 - [INEB-Instituto de Engenharia Biomédica](#), Porto, Portugal, external advisory council, since 2008.

Computer experience

Programming:

FORTRAN (Fortran 77 and 90) and WATFIVE interactive, various dialects of PASCAL, LOGO, BASIC; SPEAKEAZY, dBase IV and older, Lotus 123, Framework IV and older (Fred language); Matlab, symbolic algebra languages Mathematica, Maple, Reduce, HTML.

Computer systems:

UNIX (Standard, AIX, Sun OS/Solaris), MS Windows 3.1/95/NT/2000, MS-DOS, CP/M, TSO, CMS, Amos, Amis, IBM 360/370 systems JCL and utilities, CRAY system, VMS.

Applications:

MS Office, Lotus Smartsuite, TeX and LaTeX typesetting systems, various DOS shells: Norton, Xtree, Xtpro, PCTools, Desqview, many statistical and other application packages.

Teaching experience

Artificial intelligence, computational intelligence, neural networks, machine learning, fuzzy and rough logic.

Cognitive science, introductory courses, including philosophy of mind, neurobiology, brain and behavior.

Computer science, introductory courses, introductory programming courses in Fortran, Pascal, Logo, applications and networking.

Physics, basic and advanced quantum mechanics, field theory (classical), foundations of physics, elementary and advanced quantum chemistry, atomic and molecular physics, group theory, computer methods in physics.

Popularization of science

About 40 popular articles in many journals.

2 major awards for popularization of science (1983, 1984).

Other Major Interests

In no particular order: music of all kinds; musical instruments (collection of flutes, Electronic Wind Instrument AkaiPro EWI400s); scuba diving (holding Advanced Open Water Diver certificate), oriental philosophy (Chinese, Indian, Japanese, Korean), especially meditation schools, frontiers of science and technology, brain research, psychology, artificial intelligence, cognitive science, science-fiction, Hi-Fi and digital sound/video.

Languages:

- Polish - mother language
- English, Russian - fluent (written and spoken)
- German - good (written and spoken)

Research fields, in order of present interest

- Neurocognitive informatics, or algorithms that are inspired by brain functions, including imagination, intuition, insight and creativity.
- Theory and applications of computational intelligence, including neural networks, similarity-based systems, relations with fuzzy systems, pattern recognition, artificial intelligence, selection of relevant information, visualization of multidimensional data and relations, meta-learning techniques.
- Natural language processing, computer linguistics, information retrieval and extraction, connections with human memory models, word games, medical informatics, semantic internet.
- Computational cognitive neuroscience, cognitive science, cognitive robotics, cognitive informatics, cognitive psychology, developmental psychology, large scale simulations of brain functions, human-computer interaction, humanized software interfaces.
- Informational dynamics: concept of information, brain-mind transition, theory of complex systems.
- Philosophy of mind, foundations of physics, quantum computing, philosophical problems of physics, history of physics.
- Education: infant learning and development, testing cognitive, motor and perceptual functions, new educational programs, application of computers in education, development of computational science educational programs.
- **Older research areas I was working in:** Computer physics, computational methods of quantum chemistry, electron correlation problem, in particular variational methods of the configuration interaction type.
- Group theory, including the symmetric and the unitary group theory, properties of non-abelian symmetry groups; theory of graphs, graphical representations of tensor Hilbert spaces, nuclear physics theory, shell-model methods in nuclear physics; spin functions, construction, properties, spin-dependent problems; Jahn-Teller effect in molecules, vibronic couplings, harmonic oscillators.
- Software engineering tools and methods, object-oriented programming; numerical analysis: partial diagonalization of very large sparse matrices.

Major Grants

Involvement in international projects:

- 2010 *CHIST-ERA Consortium*, EU FET Project
- 2009-2012 *2nd European Network for the Advancement of Artificial Cognitive Systems, Interaction and Robotics*, FP7 EU Networks Project
- 2008-2012 *COST Action BM0605 "Consciousness: A Transdisciplinary, Integrated Approach"*, EU COST Project
- 2008-2012 *COST Action BM0601 NeuroMath "Advanced Methods For The Estimation Of Human Brain Activity And Connectivity"*, EU COST Project
- 2007-2010 *Argumentation*, UMK - Rutgers University
- 2005-2007 *COST Action B27 Group, "Electric neuronal oscillations and cognition (ENOC)"*, EU COST Project
- 1999-2001 *Similarity-based reasoning systems with applications in science and medicine*.
IBMBF-KBN POL-040-98, principal investigator on Polish side (IBMBF, Internationale Büro (IB) das Bundesministerium für Bildung und Forschung)
- 1996 Kyushu Institute of Technology, Heiwa Nakajima Foundation Research Award, 3 month, about 18.000 \$.
- 1995 *Development of electron correlation methods based on intermediate hamiltonians*. (principal investigator on the Polish side, with prof. J-P. Malrieu on the French side). Cooperation scientifique entre la France et la Pologne, KBN/Le ministre Francais des affaires etrangeres, No. 114
- 1995 *European Union COST project "Intelligent software for chemistry"*, W. Duch, first co-investigator, in collaboration with Max Planck Institute of Astrophysics (Garching b. Munchen, prof. Diercksen, principal investigator), Belfast (Ireland), Bratislava (Slovakia), Groningen (Holland), Leeds (UK) and Espoo (Finland).
- 1994 Rikkyo University, Tokyo, Research Award, 3 month, about 13.000 \$.
- 1992-1995 CEC TEMPUS Office, "Computer Based Education", 3 years; budget 196.000 ECU in 1992/3, 279.000 ECU in 1993/4 and 310.000 in 1994/5; coordinator of the program. Participating institutions: Nicolaus Copernicus University (main beneficiary), University of Cambridge and University of Leeds (UK), Paul Sabatiér University and Universite de Champagne in Reims (France), Max Planck Institute of Astrophysics and the Technical University of Munich (Germany)
- 1986-1987 Alexander von Humboldt Stiftung, Germany; "Application of symmetric group methods in quantum chemistry", research support for 18 months, additional support (around 20.000 DM) for equipment and books.

National grants:

- 2010-2012 *Autism: comprehensive approach*. MNiSW, principal investigator
- 2010-2012 *Prototype-based logical rules with applications for data exploration*. MNiSW, PI - M. Blachnik

- 2010-2012 *Heterarchical methods of information search supported by lexical networks*. MNIŚW, PI - J. Szymanski
- 2005-2007 *Selection of information*. KBN, principal investigator, no. T11C-07128
- 2005-2007 *Meta-learning*. KBN, co-principal investigator
- 2000-2002 *Theory and applications of computational intelligence*. KBN, principal investigator, no. 8 T11C 006 19
- 2000-2001 *Application of similarity based methods to analysis of medical images*. KBN, PhD grant for Karol Grudziński, no. 8 T11E 042 19
- 2000-2001 *Application of the neurofuzzy FSM system to analysis of experimental data*. KBN, PhD grant for Rafał Adamczak, no. 8 T11F 019 19
- 1998-2000 [Med-Uni project](#), Stefan Batory Foundation, grant director
- 1998-1999 *Adaptive systems in applications to analysis of medical and psychometrical data*, KBN, principal investigator
- 1998-1999 *Sieci ontogeniczne - badania nad kontrolą złożoności sieci neuronowych*, KBN, PhD grant for Norbert Jankowski, 19 750 zł
- 1995-1997 *Neurofuzzy systems*, KBN, 133.000 PLN, principal investigator
- 1995 Grant from KBN to build *Local Area Network* in the Institute of Physics and Department of Informatics building, about 25.000 \$ (with physics).
- 1992-1993 UMK, local grant, "What can you teach neural networks?", principal investigator.
- 1991-1993 KBN (State Committee for Scientific Research), "Development of configuration interaction method", principal investigator.
- 1991-1992 UMK, local grant, "Models of neural networks", principal investigator.
- 1990-1991 UMK, local grant, "Parallel data processing", principal investigator.
- 1989-1990 Resortowy Program Badawczo-Rozwojowy RRI.14: "Budowa systemów oprogramowania profesjonalnego dla potrzeb nauki i dydaktyki: symulacje komputerowe w fizyce" (computer simulations in physics; software development); local coordinator of the program supervising about 10 investigators.
- 1988-1991 Resortowy Program Badawczo-Rozwojowy RRI.14 : "Informatyzacja procesów dydaktycznych i naukowo badawczych w szkołach wyższych" (computer methods in teaching and research); local coordinator of large program, planning and creation of 6 computer laboratories at the Nicolaus Copernicus University.

- [List of Papers](#)
- [Conferences and Schools Attended](#)
- [Invited Talks](#)
- [WD in Nauka Polska](#).