

CURRICULUM VITAE

May 2005

Włodzisław Duch sex: male

Polish Office address Katedra Informatyki Stosowanej (Department of Informatics)
Wydział Fizyki, Astronomii i Informatyki Stosowanej (Faculty of Physics, Astronomy and Informatics)
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Singapore Office Visiting Professor, Nanyang Technological University,
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Blk N4-02c-114, Nanyang Avenue, Singapore 639798 (July-January each year).

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Personal data	Born	27 July 1954, in Kwidzyn, Poland
	Nationality	Polish
	Married	18.04.1976, with Maria Wiśniewska
	Children	13.07.1978, Jakub; 06.08.1980, Alicja

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 (thesis won the Ministry of Education Award in 1981). Thesis advisor: Prof. dr hab. Jacek Karwowski.

1977-1980 Graduate study in quantum chemistry at the Nicholas Copernicus University, Toruń, Poland.

1977 Master of Science diploma (highest honors, “blue diploma”).

1972-1977 Undergraduate study in physics at the Nicholas Copernicus University, Toruń, Poland.

Positions held (one month or longer only):

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).

- Since 2000** Position of the “Professor Ordinarius” (prof. zwyczajny).
- Since 1998** President, DuchSoft research and development company.
- 1990-1999** Associate Professor (Profesor Nadzwyczajny), Nicholas Copernicus University, UMK, head of the Department of Computer Methods, Toruń, Poland; teaching, research, administration, member of countless committees.
- 1996-2001** Visiting Scientist, Max-Planck-Institut für Astrophysik (MPA), Garching b. München, Germany; 1 month each year, research.
- 2000** Visiting Professor, Meiji University, Kawasaki, Tokyo, Japan; 1 month, research.
- 1997** Visiting Scientist, Max-Planck-Institut für Psychologische Forschung (MPPF), München, Germany; 1 month, research.
- 1997** Visiting Professor, Artificial Intelligence Department, Louis Pasteur Universite, Strasbourg, France, 1 month, research.
- 1996** Kyushu Institute of Technology, Faculty of Computer Science and Systems Engineering, Senior Research Fellow, 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** Rikkyo University, Department of Chemistry, Senior Research Fellow, 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, Nicholas Copernicus University.
- 1988-1990** Associate Professor (Docent), Nicholas Copernicus University, Institute of Physics, Toruń, 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 (1.5 years). Max-Planck-Institut für Astrophysik (MPA), Garching b. München, Germany; 1.5 month, research.
- 1984-1988** Adiunkt (Assistant Professor), Institute of Physics, Nicholas Copernicus University, Toruń, 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, Nicholas Copernicus University, Toruń, 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, Nicholas Copernicus University, Toruń, Poland; teaching and research.

Professional associations: (in alphabetic order)

- Behavioral and Brain Sciences (BBS) associate, since 2003
- Cognitive Science and Media in Education, scientific secretary, since 1998
- Computer Physics Communications (North Holland), Special Editor, since 1994
- IEEE Transactions on Neural Networks, books and media editor, appointed 2000, 2002, 2004
- International Journal of Computational Intelligence, editor, since 2004
- International Journal of Neural Systems (IJNS), World Scientific, Editorial Advisory Board 2005
- International Journal of Signal Processing, editor, since 2004
- International Journal of Transpersonal Studies, editor, 2001
- Neural Information Processing Letters and Reviews, since 2003
- Machine Graphics and Vision, since 2003
- The Journal of Mind and Behavior, assessing editor, 2002
- European Union expert in the 5th Framework Program in the “Life Sciences” panel, Marie Curie program, 2000-2002.
- European Union expert in the 6th Framework Program in the “Life Sciences” panel, 2003/04.
- Polish Committee of Scientific Research, reviewer for VIII (1994), IX (1995), X (1996) calls, section (T11E), Medical Technologies
- Reviewer of the Polish Ministry of Education (since 1994-now)
- Association for Computing Machinery (ACM) individual member since 1990.
- Computational Physics Section, PAN Committee of Physics, founding member 1997
- European Neural Network Society, ENNS President-elect 2004, for the term 2005-2007; member of the executive committee 2001-2003; individual ENNS member since 1993.
- European Physical Society individual member since 1984.
- IEEE individual member since 1997; senior member 2002.
- IEEE Computational Intelligence Society, CIS Technical Committee member, since 2003
- IEEE Neural Network Society (previously NN Council), active member since 6/1997, NNS Technical Committee member.
- International Neural Network Society; INNS Board of Governors member, 2003.
- Open Systems and Information Dynamics Society (formerly “Polish–Japanese Society”); member of the board, 1992-1995, 1999-2003 (elections are every year).
- Polish Academy of Sciences, Computational Physics Section. Founding member (1997), vice-president (2001).
- Polish Academy of Sciences, Committee on Automatics and Robotics, Neural Networks and Fuzzy Logic Section, member (since 2000).
- Polish Chemical Society; Quantum Chemistry section, since 1980.
- Polish Cognitive Science Society; founding member, on the executive board 2002-2004.
- Polish Neural Network Society; founding member, on the board since 1995.
- Polish Physical Society; member since 1977, secretary of the Toruń chapter 1989-91; member of the board 1988-1992.
- Polish Transpersonal Society; founding member 1993.

- Societas Humboldiana Polonorum, member since 1993.
- Nicolaus Copernicus University, member of the professors club, since 2001.

Computer experience:

Programming: FORTRAN (Fortran 77 and 90), Matlab, WATFIVE interactive, various dialects of PASCAL, LOGO, BASIC; SPEAKEAZY, dBase IV and older, Lotus 123, Framework IV and older (Fred language); 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, T_EX and L^AT_EX typesetting systems, various DOS shells: Norton, Xtree, Xtpro, PCTools, Desqview, many 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; scuba diving (Advanced Open Water Diver), frontiers of science and technology, brain research, psychology, artificial intelligence, cognitive science, science-fiction, oriental philosophy (Chinese, Indian, Japanese, Korean), especially meditation schools, 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

- 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.
- Natural language processing, computer linguistics, information retrieval and extraction, connections with human memory models, word games, medical informatics.
- 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, development of new educational programs, application of computers in education, development of computational science educational programs.

- Older: 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:

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, with Karol Grudziński, no. 8 T11E 042 19

2000-2001 *Application of the neurofuzzy FSM system to analysis of experimental data*. KBN, with Rafał Adamczak, no. 8 T11F 019 19

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)

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.

1995-1997 *Neurofuzzy systems*, KBN, principal investigator.

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 *Intelligent software for chemistry*, European Union COST project. 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).

1995 Grant from KBN to build *Local Area Network* in the Institute of Physics and Department of Computer Methods building

1994 Rikkyo University, Tokyo, Research Award, 3 month

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: Nicholas 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.

Conferences and schools attended: 167 at the end of 2002; the list is stored at:
<http://www.phys.uni.torun.pl/~duch/cv/cv-conf.html>

Invited Lectures: 136 = 57 abroad + 79 in Poland, at the end of 2002;
<http://www.phys.uni.torun.pl/~duch/cv/cv-conf.html#lectures>

List of publications: 290 at the end of 2002; the list is stored at:
<http://www.phys.uni.torun.pl/~duch/cv/papall.html>