

CURRICULUM VITAE

Name Pekka Neittaanmäki

Address

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Personal

<i>Date of birth:</i>	April 14, 1951	
<i>Place of birth:</i>	Saarijärvi, Finland	
<i>Citizenship:</i>	Finnish	

Education

<i>Degree</i>	<i>Date</i>	<i>School</i>
M.Sc.	1973	University of Jyväskylä
Ph.Lic.	1976	University of Jyväskylä
Ph.D.	1978	University of Jyväskylä

Languages Skills

Finnish (native); English (good); German (good); Swedish (good)

Professional Experience

1988–present	Professor in Information Technology, Numerical Analysis and Its Applications, University of Jyväskylä
2010–present	Dean of the Faculty of Information Technology, University of Jyväskylä
2003–present	Head of COMAS (Computing and Mathematical Sciences) Graduate School, University of Jyväskylä
1995–1999	
2008–present	Visiting Professor, Tokyo Institute of Technology, Japan
2000–present	Adjoint Professor, University of Houston, USA
1991–present	Docent in Applied Mathematics (Numerical Analysis), Helsinki University of Technology and Tampere University of Technology
1986–present	Docent in Information Technology, Lappeenranta University of Technology
2000–2009	Chairman of Agora Human Centered Information Technology Research Center, University of Jyväskylä
1993–2000	Vice Rector, University of Jyväskylä
1986–1988	Associate Professor in Applied Mathematics (Mathematical Computer Sciences), University of Jyväskylä (on leave 1988–1993)
1982–1985	Associate Professor in Computer Science, Lappeenranta University of Technology

Visiting Positions

- 1978, September – 1979, August Visiting Researcher, Sonderforschungsbereich 72,
University of Bonn
- 1986, May-June Visiting Professor, University of Hamburg
- 1980–1999 Visiting researcher 1–4 weeks at several Universities throughout Europe,
USA and Japan

Memberships

Academies

- The Finnish Academy of Science and Letter, Finland 1994–
- The Finnish Academy of Technology, Finland 1992–
- International Informatization Academy, Moscow (academician) 1997–
- St. Petersburg Academy of Sciences (academician) 1999–

Societies

- Finnish Information Technology Society
- Mathematical Union of Finland
- Finnish Technical Society
- Operation Research
- American Mathematical Society
- Society for Industrial and Applied Mathematics (SIAM)
- Institute of Mathematics and its Applications (IMA)
- Institute of Electrical and Electronics Engineers (IEEE, Senior member)
- Gesellschaft für Angewandte Mathematik und Mechanik
- The Association of Parliament Members and Scientists (TUTKAS, tutkijat ja kansanedustajat)
- Finnish Society for Future Studies (Tulevaisuuden tutkimuksen seura)
- Finnish Mechanics Society (Suomen mekaniikkaseura)

Organizations

- ECCOMAS (European Community on Computational Methods in Applied Sciences), member of the board 2000–, Vice President 2005–2012

Decorations

- Leonhard Euler Medal, Russian Academy of Sciences, Russia, 2011
- Commemorative Medal, Czech Mathematical Society, Czech Republic, 2011
- Doctor h.c., St. Petersburg State University, Russia, 2010
- Bernard Bolzano Honorary Medal, Academy of Sciences of the Czech Republic, 2007
- Chevalier de l'Ordre des Palmes académiques, France, 2004

Fellowship Positions

- Researcher, Academy of Finland, 1985
- Exchange scholar
- DAAD–fellowship, University of Bonn, 3 months, 1976
- Brief (at most 3 months) fellowship visits to the following universities:
Bonn, Essen, Augsburg, Glasgow, Charles University Prague, Lundby, INRIA (Le Chesnay), Banach Centre Warsaw, Santa Barbara, Nice, Pavia, St. Petersburg, Moscow

Research

- coauthor of 13 monographs
- editor of 30 proceedings or lecture notes
- author or coauthor of about 300 journal or conference papers
- coauthor of a lecture note on nonlinear programming

Research Interests

- partial differential equations (PDE's)
- numerical analysis and mathematical software
- optimization and optimal control
- computer aided optimal design (CAOD)
- signal processing
- monitoring and diagnostics
- industrial applications of information technology
- mobile services
- innovative learning solutions

Member of Program/Scientific Committees

- International Workshop on Reliable Methods of Mathematical Modeling RMMM 2011, 6—8 July 2011, Lausanne, Switzerland
- 11th Workshop on Optimization and Inverse Problems in Electromagnetism, Sofia, Bulgaria, 14—18 September, 2010
- International Workshop on Reliable Methods of Mathematical Modeling RMMM 2009, Berlin, Germany, 24—26 June 2009
- 18th International Conference on Computer Methods in Mechanics (CMM 2009), Zielona Góra, Poland, 18—21 May 2009
- IFAC Workshop on Control Applications of Optimization, Jyväskylä, Finland, 6—8 May 2009
- 8th World Congress on Computational Mechanics (WCCM8) and the 5th European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008), Venice, Italy, 30 June – 4 July 2008
- 4th Conference on Superconvergence Phenomena in the Finite Element Method, Prague, Czech Republic, 25—28 June 2008
- International Workshop on Reliable Methods of Mathematical Modeling RMMM 2007, St. Petersburg, Russia, 24—27 July 2007
- EUROGEN 2007 – ECCOMAS Thematic Conference on Evolutionary and Deterministic Methods for Design, Optimization and Control with Applications to Industrial and Societal Problems, Jyväskylä, Finland, 11—13 June 2007
- ADMOS 2005 International Conference on Adaptive Modeling and Simulation, Barcelona, Spain, 8—10 September 2005
- The International Conference on Bio-Nano-Informatics (BNI) Fusion, Marina del Rey, California, USA, 20—22 July 2005
- ENUMATH 2005 European Conference on Numerical Mathematics and Advanced Applications, Santiago de Compostela, Spain, 18—22 July 2005
- ECCOMAS 2004, European Conference on Computational Methods and Applied Sciences, Jyväskylä, Finland, 24—28 July 2004
- ECCOMAS 2000 European Conference on Computational Methods and Applied Sciences, Barcelona, Spain, 11—13 September 2000
- Finite Element Methods Three-dimensional Problems, Jyväskylä, Finland, 27 June –

- 1 July 2000
- 5th French-Russian-Finnish Workshop on Experimentation, Mathematical Modeling and Computation in Engineering Sciences, Jyväskylä, Finland, 26—28 June 2000
 - Finite Element in Flow Problems 2000, Austin, Texas, USA, 30 April –4 May 2000
 - ENUMATH99 Third European Conference on Numerical Mathematics and Advanced Applications, Jyväskylä, Finland, 26—30 July 1999
 - EUROGEN99 Short Course on Evolutionary algorithms in Engineering and Computer Science, Jyväskylä, Finland, 30 May –3 June 1999
 - ENUMATH 97 Second European Conference on Numerical Mathematics and Advanced Applications, September 29 – October 3, 1997, Heidelberg, Germany
 - Finite Element Methods: Superconvergence, Post-processing and A Posteriori Estimates, July 1—4, 1996, Jyväskylä, Finland
 - ENUMATH 95 Conference on Numerical Mathematics and Advanced Applications, Paris, France, 18—22 September 1995
 - ICIAM 1995, Chairman and organizer of Minisymposium on Paper Technology
 - Biomechanics, 1995, Jyväskylä, Finland
 - International Conference in Fluid Mechanics, Barcelona, Spain, 1994
 - Domain Decomposition Methods and Free Boundary Problems, Jyväskylä, Finland, March 1992
 - Days of Industrial Mathematics 92, Lappeenranta, Finland, 1992
 - Computer Aided Mathematics, Jyväskylä, Finland, October 1991
 - International Summer Semester, Jyväskylä, Finland, August 1991
 - IMACS World Conference, Dublin, Ireland, July 1991
 - Meeting of scientific supercomputing, Centre of Scientific Computing, Helsinki, Finland, March 1991
 - Days of Mechanics, Lappeenranta, Finland, June 1991
 - Symposium on Finite Element Method in Simulation, Jyväskylä, Finland, 15—16 March 1990
 - Numerical Methods for Free Boundary Problems, Jyväskylä, Finland, 23—28 July 1990
 - ECMI-90 Conference, Lahti, Finland, 23—25 May 1990
 - Industrial mathematics, Lammi, Finland, 1988
 - Minisymposium on Numerical Methods for Magnets and Semiconductors, Jyväskylä, Finland, 1988
 - Numerical Simulation Models, Jyväskylä, Finland, 1986
 - Numerical Analysis, Summer School, Jyväskylä, Finland, 1985

Major Committees/Industrial Appointments

- Keskimaa Retail Cooperative, board member 1997–
- Jyväskylä Science Park, board member 1995–
- Simulation Techniques Co., partner, board member 1988–
- University Consultants Co., partner and head of the board member 1986–
- MACSI-net (Mathematics, Computing and Simulation for Industry) network coordinator 2000–2004
- Ministry of Education, Finnish knowledge of mathematics and sciences, 2002
- ESF project: SME and PhD's –study on the relationship between PhD's and private enterprises, project leader 1997–1998
- INTAS: Mathematical and Numerical Modelling of Phase Changing Problems, Project coordinator, 1996–1998
- ESF, Research Conference on Mathematical Methods in Industrial Problems, Vice Chairman, 1995–1996

- Steering Committee of ESF (European Sciences Foundation) program: Free boundary problems, 1993–1997
- Academy of Finland, representative in Research Council for Natural Sciences and Engineering, 1995–1997
- HCM Programme: Control Problems and Applications 1994–1996
- HCM Programme: Mathematics as an Industrial Resource 1993–1995
- Finland Centre of Excellence Network in Technology, leading group 1993–1995
- Centre of Supercomputing, Member in scientific advisory board, 1990–1992, 1992–1994
- Rolf Nevanlinna Institute, Member of advisory board, 1988–1990, 1992–1994
- Rolf Nevanlinna Institute, Member of the directors, 1987–1990
- Ministry of Education, Chairman of evaluation of education in mathematics and natural sciences, 1991–1992
- Ministry of Education, University commission of technology and sciences, 1990–1992
- Ministry of Education postgraduate program in information technology, 1986–1991
- Academy of Finland, representative in Applied Mathematics and Information Technology in Academy of Finland, Council of Technology, 1986–1991

Editorial Boards

- Advances in Mathematical Sciences
- Journal of Numerical Mathematics (formerly East-West Journal of Numerical Mathematics)
- Editor of 15 conference proceedings

Evaluation Positions

- Evaluator of FWF (Austrian Science Fund) 2001–
- Evaluator of Lithuanian State Science and Studies Foundation 2007–2008
- Evaluator of Slovenian Research Agency 2006–2008
- Evaluator of German Research Foundation 2006
- ESF/PESC programme Applied Mathematics for Industrial Flow Problems (AMIF), evaluator 1999
- Evaluation of one INTAS project 1995
- INTAS, referee 1994
- Evaluations for promotion of several candidates to professors at University of Houston, University of Cincinnati, Texas A&M University, University Kent, 1993–

Research Grants/Contracts

- Tekes project Amob 2009—2012
- Tekes project SCOPE (Scientific innOvation Product concept) 2009–2012
- Tekes project SCOMA (Scientific Computing and Optimization in Multidisciplinary Applications) in MaSi (Modeling and Simulation) Technology Programme 2005–2010
- Tekes project InBCT (Innovation in Business, Communication and Technology) 2000–2004
- MACSI-net (Mathematics, Computing and Simulation for Industry) network 2000–2004
- INTAS 2 projects: INTAS (International Association for the Promotion of Cooperation with Scientists from the Independent States of the Former Soviet Union) programme: the universities involved are University of Jyväskylä, St. Petersburg Technical University, Technical University of Munich and University of Milan, period 1994–1997.
- EC-project "DECISION" (HPCN Integrated Optimization Strategies for Increased Engineering Design Complexity) 1997–1999

- INGENET Thematic Network 1996–2000
- Several projects on scientific computing, computer aided optimal design, electrical circuits, nonlinear systems supported by Academy of Finland, Council Science and Technology during years 1984–1992
- Computer Aided Teaching of Mathematics in Technical Colleges (1991–1992) (together with Technical College of Jyväskylä)
- ESPRIT GENESIS/S (EP 2702) project High Performance parallel systems for numerical applications (1990-1992), several universities and research institutions in Europe
- TEKES project FEM based Simulation and Supercomputer Applications (1990–1991)
- Finsoft III (1989–1991) National program for developing programming tools for parallel computing, several universities supported by TEKES
- Numerical Simulation Models in Paper Making (1986–present) Valmet Paper Industry (many various contracts)
- Expert systems for talent searching in long distance running (together with Faculty of Sport Education) (1989–1991)
- Expert Systems in economical planning (together with Department of Economics) (1986–1987)
- Continuous Casting of Steel (1984–1990) (Technology Development Centre of Finland TEKES) together with Helsinki University of Technology, Koverhar Steel Works, Outokumpu Oy Steel, Ovako Steel Oy Ab, Rautaruukki Oy, Raabe Steel Works
- Project Computer Simulation of Vaneering Making Process (1982–1984) with Schauman Oy Vaneering Work

Teaching Experience

Since 1974 teaching experience in Numerical methods, Programming, CAD, Simulation, Optimization, Optimal control, FEM, Mathematical modeling

Thesis Supervision

Ph.D. (62 Ph.D. theses)

O. Mali	Analysis of errors caused by incomplete knowledge of material data in mathematical models of elastic media, 2011 (together with Prof. S. Repin)
S. Nikitin	Dynamic aspects of industrial middleware architectures, 2011 (together with Prof. V. Terziyan and Prof. T. Tiihonen)
A. Pennanen	A graph-based multigrid with applications, 2010 (together with Prof. T. Rossi)
M. Häkkinen	Why alarms fail: A cognitive explanatory model, 2010 (together with Prof. P. Saariluoma)
T. Puurtinen	Numerical simulation of low temperature thermal conductance of corrugated nanofibers, 2010 (together with Prof. L. Baskin, University for Telecommunications, Russia, and Prof. B. Plamenevskii, St. Petersburg State University, Russia)
E. Kudryashova	Cycles in continuous and discrete dynamical systems: Computations, computer-assisted proofs, and computer experiments (together with Prof. G. Leonov, St. Petersburg State University, Russia, and Dr. N. Kuznetsov), 2009

- T. Valkonen Diff-convex combinations of Euclidean distance: a search for optima (together with Prof. M. M. Mäkelä, University of Turku, Finland, and Prof. T. Kärkkäinen), 2008
- A. Pozharskii On the electron and phonon transport in locally periodical waveguides (together with B. Plamenevskii, St. Petersburg State University, Russia, and L. Baskin, University for Telecommunications, Russia), 2008
- O. Sarafanov Asymptotic theory of resonant tunneling in quantum waveguides of variable cross-section (together with B. Plamenevskii and L. Baskin), 2008
- T. Nousiainen Children's involvement in the design of game-based learning environments (together with Doc. M. Kankaanranta), 2008
- N. Kuznetsov Stability and oscillation of dynamical system and applications (together with Prof. G. Leonov), 2008
- Yu. Pavlova Multistage coalition formation game of a self-enforcing environmental agreement (together with Dr. M. Dementieva), 2008
- E. Laitila Symbolic analysis and atomistic model as a basis for a program comprehension methodology (together with Prof. T. Kärkkäinen), 2008
- E. Gorshkova A posteriori error estimates and adaptive methods for incompressible viscous flow problems (together with Prof. S. Repin, V. A. Steklov Institute of Mathematics in St. Petersburg, Russia), 2007
- T. Ruohonen Improving the operation of an emergency department by using a simulation model, 2007
- N. Kohvakko Context modeling and utilization in heterogeneous networks, 2006
- D. Zhovtobryukh Context-aware web service composition, 2006
- P. Turchyn Adaptive meshes in computer graphics and model-based simulation, 2006
- K. Nevala Content-based design engineering thinking: In the search for approach, 2005 (together with Prof. P. Saariluoma and Prof. J. Karhunen, University of Oulu, Finland)
- K. Kärkkäinen Shape sensitivity analysis for numerical solution of free boundary problems, 2005 (together with Prof. T. Tiihonen)
- S. Matyukevich The nonstationary Maxwell system in domains with edges and conical points, 2005 (together with Prof. B. Plamenevskii)
- V. Solbakov Application of mathematical modeling for water environment problems, 2004
- J. Kujala On computation in statistical models with a psychophysical application, 2004 (together with Dr. T. Lukka)
- M. Frolov Reliable control over approximation errors by functional type a posteriori estimates, 2004
- M. Dementieva Regularization in multistage cooperative games, 2004
- V. Kalvine Scattering and point spectra for elliptic systems in domains with cylindrical ends, 2004

- L. Seyukova-Rivkind Mathematical and numerical analysis of boundary value problems for fluid flow, 2002
- V. Akimov Domain decomposition methods for the problems with boundary layers, 2002
- P. Virtanen Neuro-fuzzy expert systems in financial and control engineering, 2002
- M. Kovalainen Computer mediated organizational memory for process control: Moving CSCW research from an idea to a product, 2002 (together with Prof. K. Lyytinen)
- K. Saarinen Near infra-red measurement based control system for thermo-mechanical refiners, 2001
- K. Hirvonen Towards better employment using adaptive control of labour costs of an enterprise, 2001
- A. Smolianski Numerical modeling of two-fluid interfacial flows, 2001
- T. Taskinen On the steady-state flow of an elastic-plastic material past cones and wedges, Mathematical Institute, University of Oxford, United Kingdom, 2000
- D. Kuzmin Numerical simulation of reactive bubbly flows, 1999
- J. Toivanen Fictitious domain method applied to shape optimization, 1997 (together with J. P eriaux, Dassault Aviation, France, and Prof. R. A. E. M akinen)
- E. Heikkola Domain decomposition method with nonmatching grids for acoustic scattering problems, 1997 (together with Prof. Yu. A. Kuznetsov, University of Houston, USA)
- L. Liu Finite element analysis of nonlinear heat conduction problems, 1997 (together with Prof. M. Kř izek, Czech Academy of Sciences, The Czech Republic)
- S. Korotov Variational crimes and equilibrium finite elements in three-dimensional space, 1997
- J. Hokkanen Aiding public environmental decision making by multicriteria analysis, 1997 (together with Ass. Prof. R. Lahdelma)
- P. Risku A computer-based mathematics learning environment in engineering education, 1996
- A. Niemist o FE-approximation of unconstrained optimal control like problems, 1995
- T. Rossi Fictitious domain methods with separable preconditioners, 1995 (together with Prof. Yu. A. Kuznetsov, University of Houston, USA)
- A. Murgu Neural networks for planning and control in communication networks, 1995
- K. Hiltunen Mathematical and numerical modelling of consolidation processes in paper machines, 1995
- T. K arkk ainen Error estimates for distributed parameter identification problems, 1995
- P. Tarvainen Block relaxation methods for algebraic obstacle problems with M -matrices: Theory and applications, 1994

- J.-P. Santanen On bounding approach for timing simulation of digital integrated circuits, 1994 (together with Prof. C. A. Marinov, Polytechnical University of Bucharest, Romania)
- K. Miettinen On the methodology of multiobjective optimization with applications, 1994
- M. Miettinen Approximation of hemivariational inequalities and optimal control problems, 1993
- J. Hämäläinen Mathematical modelling and simulation of fluid flows in the headbox of paper machines, 1993 (together with Ass. Prof. T. Tiihonen)
- A. Eljendy Exact controllability and stabilization of hyperbolic systems through boundary control, 1992
- K. Salmenjoki On numerical methods for shape design problems, 1991
- X. C. Tai Parallel computing with splitting-up methods and the distributed parameter identification problems, 1991
- T. Männikkö Convex and nonconvex duality in optimal control, 1990
- V.-M. Hokkanen On the solvability of some non-linear dynamic systems, 1990
- M. Mäkelä Nonsmooth optimization. Theory and algorithms with applications to optimal control, 1990
- R. Mäkinen On computer aided optimal shape design, 1989
- E. Laitinen On the simulation and control of the continuous casting process, 1989
- V. Hara On the delay time for distributed networks, 1988
- K. Ruotsalainen On the convergence of some boundary element methods in the plane, 1987 (together with Prof. J. Saranen, University of Oulu, Finland)
- T. Tiihonen Shape optimization and unilateral boundary value problems, 1987

M.Sc.

Several hundred M.Sc. theses in applied mathematics and computer science.

External examiner

Ph.D. theses in Helsinki University of Technology, Tampere University of Technology, University of Oulu, and Chalmers University of Technology.

Publications and Patents

According to the Publication Type Classification of the Ministry of Education, Science and Culture, see appendix

- A Peer-reviewed scientific articles
 - A1 Journal article (refereed), original research
 - A4 Conference proceedings
- B Non-refereed scientific articles
 - B2 Book section
 - B3 Non-refereed conference proceedings
- C Scientific books (monographs)
 - C1 Book
 - C2 Edited book, conference proceedings or special issue of a journal

- D Publications intended for professional communities
 - D1 Article in a trade journal
 - D2 Article in a professional manual or guide or professional information system, textbook material
 - D3 Professional conference proceedings
 - D4 Published development or research report or study
 - D5 Textbook, professional manual or guide, dictionary
- G Theses
 - G4 Doctoral dissertation (monograph)
- H Patents and invention disclosures
 - H1 Granted patent