



Through the Convolution of Artificial
Intelligence and Measurement Science



Dr. Hojjat Adeli

Ph.D, IEEE member, Ohio State University

“Impact of Ubiquitous Machine Learning on the Society”

Hojjat Adeli (F'12) received the Ph.D. degree from Stanford University, Stanford, CA, USA, in 1976., He held the Honorary/Distinguished Professorship at seven Asian and European Universities. He has authored over 600 research and scientific publications including 16 high-technology books, and holds a U.S. patent in the area of design optimization., Dr. Adeli was a recipient of over 50 awards and honors. In 1998, he received the Distinguished Scholar Award and The Ohio State University's Highest Research Award, “in recognition of extraordinary accomplishment in research and scholarship.” In 2010, he was an Engineering Legend in the ASCE Journal of Leadership and Management in Engineering. He presented Keynote/Plenary Lectures at 109 conferences held in 44 different countries. He has been an Associate Editor or a member on the editorial board of 141 research journals. He is the Founder and the Editor-in-Chief of the international journals Computer-Aided Civil and Infrastructure Engineering and Integrated Computer-Aided Engineering. He is the Editor-in-Chief of the International Journal of Neural Systems. He is a corresponding member of the Spanish Royal Academy of Engineering, a Foreign Member of the Lithuanian Academy of Sciences and the Polish Academy of Science, a Distinguished Member of ASCE, and a fellow of AAAS, IEEE, AIMBE, and the American Neurological Association.



Dr. Witold Pedrycz

Professor, University of Alberta, Edmonton, Canada

**“Data and Domain Knowledge-Oriented Elicitation
of Interpretable Information Granules”**

Witold Pedrycz is also with the Systems Research Institute of the Polish Academy of Sciences, Warsaw, Poland. He also holds an appointment of special professorship in the School of Computer Science, University of Nottingham, UK. In 2009, Dr. Pedrycz was elected a foreign member of the Polish Academy of Sciences. His main research directions involve Computational Intelligence, fuzzy modeling and Granular Computing, knowledge discovery and data mining, fuzzy control, pattern recognition, knowledge-based neural networks, relational computing, and Software Engineering. He has published numerous papers in this area. He is also an author of 14 research monographs covering various aspects of Computational Intelligence and Software Engineering. Witold Pedrycz has been a member of numerous program committees of IEEE conferences in the area of fuzzy sets and neurocomputing. Dr. Pedrycz is intensively involved in editorial activities. He is an Editor-in-Chief of Information Sciences and Editor-in-Chief of IEEE Transactions on Systems, Man, and Cybernetics - part A. He currently serves as an Associate Editor of IEEE Transactions on Fuzzy Systems and is a member of a number of editorial boards of other international journals. He has edited a number of volumes; the most recent one is entitled “Handbook of Granular Computing.” In 2007, he received a prestigious Norbert Wiener award from the IEEE Systems, Man, and Cybernetics Council. He is a recipient of the IEEE Canada Computer Engineering Medal 2008. In 2009, he has received a Cajastur Prize for Soft Computing from the European Centre for Soft Computing for pioneering and multifaceted contributions to Granular Computing.



Dr. Luca Mari

Ph.D., currently chair of the TC1, 1/25 (CEI), Università Carlo Cattaneo – LIUC

**“Measurement, Computation, Simulation, etc.:
Is There Still a Difference in the “Big Data” Age?”**

Luca Mari (MS in physics, University of Milano, Italy, 1987; Ph.D. in measurement science, Polytechnic of Torino, Italy, 1994) since 2006 has been a Full Professor of measurement science with Università Carlo Cattaneo - LIUC, Castellanza, Italy, where he teaches courses on measurement science and statistical data analysis, and systems theory. In the international context, he is currently the chair of the TC1 (Terminology) and the secretary of the TC25 (Quantities and units) of the International Electrotechnical Commission (IEC), and an IEC expert in the WG2 (VIM) of the Joint Committee for Guides in Metrology (JCGM) (in this context he developed the software for the online browsing of the International Vocabulary of Metrology (VIM) and the International vocabulary of legal metrology (VIML)). He was the chair of the TC7 (Measurement Science) of the International Measurement Confederation (IMEKO). In Italy, he is currently chair of the Technical Committee CEI 1/25 "Terminologia, grandezze e unità" of the Comitato Elettrotecnico Italiano (CEI), chair of the Technical Commission UNI-CEI 500 "Metrologia", and member of the Technical Committee CEI 085-66 "Strumentazione di misura, di controllo e da laboratorio". He was coordinator of the research area "Metrologia" of the scientific society Gruppo Misure Elettriche ed Elettroniche (GMEE). He was the coordinator of the European research project (Horizon 2020) DiDIY, Digital Do It Yourself (Jan 2015-Jun2017, 7 partners, 2 M€). He was component the Editorial Board of the journal Measurement and of the International Programme Committee of the journal Metrology and Measurement Systems (Polish academy of sciences; Committee of measurement and scientific instrumentation). He has served as scientific reviewer for the journals Frontiers in Psychology - Quantitative Psychology and Measurement, IEEE Transaction on Instrumentation & Measurement; Measurement Science and Technology; Measurement; Measurement: Interdisciplinary Research and Perspectives; Measurement Science Review; Metrologia; Metrology and Measurement Systems; NCSLI Measure: The Journal of Measurement Science; Philosophy of Science; Proceedings of the Royal Society A (Mathematical, Physical and Engineering Sciences); Program; Pure and Applied Chemistry; Quality & Quantity; Review of General Psychology. He is currently the cultural director of idea.lab, a laboratory activated by a network of schools in 2017. He is the author of about 150 papers published in international journals or in proceedings of peer-reviewed international conferences, editor of 10 special issues of scientific journals or scientific books, author of 7 educational books on information science and technology. His research activities cover different fields and are related to fundamental topics of measurement science and its relations to information science and technology, systems theory, information systems, e-learning. He is the designer and main developer of STGraph, a software engine for the simulation of dynamical systems.



Dr. Eric Benoit

Ph.D. in Physics, Associate professor, Chair T7 (IMEKO), (University Savoie Mont Blanc, Polytech Annecy-Chambéry

“Some Measurement Fundamentals to Improve AI Approaches”

Eric BENOIT, born in 1965 in France, he was graduated with a Master of Physics on “Instruments & Measurement”, and a Magister of Physics in 1988 from University Joseph Fourier (Grenoble, France). In 1993, he obtained a with honors a PhD in Physics on the topic "Symbolic sensors and fuzzy sensors: a new step to intelligence". He works as researcher at the University Savoie Mont Blanc (Annecy, France) from 1994. His fields of interest are the Measurement Science and Artificial Intelligence approaches with a focus on the measurement of weakly defined quantities and applications on IoT. He contributed to the definition of the concept of fuzzy sensors and introduced the concept of fuzzy scales in 2003 reinforced in 2006 with the proposal of a new class of fuzzy equivalence relations. This study was finalized in 2013 with the proposal of a new scale classification. In parallel he studied an automatic generation of safe software for smart instruments and now extended this field to the Internet of Things (IoT). During this period, he developed a deep understanding of the management of imperfect sources of data: uncertainty, imprecision, contradiction. The covered fields are: the possibility theory, the evidence theory, information fusion approaches including machine learning and ontologies. His present research is focused on the measurement of weakly defined quantities (human sensory sensitivity, elderly vulnerability) with the support of machine learning methods and IoT oriented infrastructure. He published more than 80 papers in proceedings of scientific conferences and journals, 13 papers in first rank scientific journals, and is co-author of 2 books. He is Member of the "Measurement Science" Technical Committee (TC7) of the International Measurement Confederation (IMEKO) from 2002. He was Scientific Secretary of the IMEKO TC7 from 2006 to 2018, and he chairs the IMEKO TC7 from 2018. In 2008, he chaired the TC1-TC7 joint IMEKO International symposium "Man, Science & Measurement" in Annecy (France). In 2017, he was mandated by the IEEE Instrumentation and Measurement Society to co-chair with Sylvie Galichet the IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA 2017) in Annecy (France). He took regularly part on the international programme committees of series of congresses and symposia: IPMU, IEAAIE, CIVEMSA, IMEKO World congresses, IMEKO TC7 symposia, AMCTM. He is reviewer for several first rank international journals: Measurement, Fuzzy Sets and Systems, Int. Journal of Uncertainty Fuzziness and Knowledge-Based Systems, IEEE Transactions on Fuzzy Systems, la Revue d'Intelligence Artificielle. He contributed to the International Programme Committee of the journal Metrology & Measurement Systems (Polish academy of sciences) and is presently involved in the editorial board of ACTA-IMEKO, the e-Journal of the International Measurement Confederation.



Dr. Svetlana V. Prokopchina

Doctor of Technical Sciences, Professor,

Financial University under the Government of the Russian Federation

“The Convolutional Approach for the Integration of Methods of Artificial Intelligence (AI) and Measurement Science (MS), Based on Bayesian Intelligent Technologies. The Concept of Bayesian Measurement Network. The Concept of IIoT – Intelligent Industrial IoT.”

Doctor of Technical Sciences, Professor, Academician of the International Academy of Informatization, the International Academy of Environmental and Life Safety Sciences, the International Metrological Academy, the Russian Environmental Academy, Corresponding Member of the International Academy of Information Processes and Technologies, expert of the United Nations Department for Sustainable Energy Development (UNECE).

She defended her thesis for the degree of Candidate of Technical Sciences on the topic: “Approximation of the laws of distributions of random variables and processes” at the St. Petersburg State Electrotechnical University (LETI). In 1995, she defended her dissertation for the degree of Doctor of Technical Sciences on the topic: “Development of methods and tools for monitoring complex objects in conditions of significant uncertainty based on the regularizing Bayesian approach” at the St. Petersburg State Electrotechnical University (LETI).

In 1997, she was awarded the academic title “Professor”. Since 2001, she is a member of the Board of Directors of JSC “Rosneftegazstroy”. From 2011 to 2013, she was Deputy Chairman of the Management Board of JSC “Rosneftegazstroy”. Since 2013, she has working as a professor at the Financial University under the Government of the Russian Federation.

Since 1990, she was scientific leader of 9 scientific projects of UNECE. Since 1998, she has the main initiator, co-chair and organizer of the annual International Conference “Soft Computing and Measurement” (SCM), St. Petersburg. Since 2017, she has the editor-in-chief of the scientific journal “Soft Measurements and Computing”. She is the author of 9 scientific monographs and about 200 articles in Russian and foreign publications. Specializes in the field of fundamental and applied works in the areas of the Bayesian approach and modern mathematics for creating systems of intelligent measurement, monitoring, auditing, management decision-making, intelligent GIS, BIG DATA, IoT, IIoT for technical and socio-economic systems in conditions of significant information uncertainty. Developed the theory and systems of soft and cognitive measurements. She directs the scientific school on the topic of Regularizing Bayesian Approach, intelligent measurement and analytical systems under the conditions of uncertainty. She has state awards, gratitude of the Ministry of Science and Education of the Russian Federation.



Prof. Giovanni Battista Rossi

University of Genova

“Modelling Direct and Indirect Measurements – Foundational Issues”

Giovanni Battista Rossi obtained the Diploma in classical humanities in 1974 from the Liceo Statale Giuseppe Mazzini, Genoa, and received the Laurea degree (with *first-class honours*) in mechanical engineering from the University of Genova, Genoa, in 1981.

A certified Engineer, he was a Designer with Fincantieri, Riva Trigoso, Italy, and then an Assistant Professor from 1983 to 1992 and an Associate Professor from 1992 to 2002. He is currently a Professor of measurement, instrumentation, and biomechanics with the University of Genova. As a Teacher, he has lectured for a national televised university teaching program (Nettuno). He has been Coordinator of the M.Sc. course “Mechanical Engineering – Design and Construction” with the University of Genova, from 2011 to 2020 and is a member of the board of lecturers of the Ph.D. School of Mechanical Engineering. He has been a Vice-Chairman with the Department of Mechanics and Machine Design from 2002 to 2008. He is Co-Editor of the book *Measurement with Persons* (Taylor and Francis, 2012) and authored the book *Measurement and Probability* (Springer, 2014). He is Co-Editor of the series *Measurement Science and Technology* of Springer. He is an EU-Recognized expert in measurement and testing and has recently chaired an expert group for the evaluation of the European Metrology Research Program and the European Metrology Program for Innovation and Research from 2016 to 2017. His current research interests include measurement science, probabilistic methods and models, perceptual and dynamic measurement, experimental biomechanics, and measurement for the sea. Dr. Rossi has been chairman of Technical Committee 7 (Measurement Science) of the International Measurement Confederation (IMEKO) from 2012 to 2018 and was the Italian Vice-Representative of the General Council of IMEKO from 2011 to 2015. He co-chaired the IMEKO-IEEE-Society of Instrument and Control Engineers Second International Symposium on Measurement, Analysis, and Modeling of Human Functions in 2004, an international intensive course on perceptual measurement in 2008, as part of the EU Measuring the Impossible Network Project, and the 2013 Joint IMEKO TC1-TC7-TC13 Symposium. He is currently a member of the scientific and technical board of the Sea Study Centre of the University of Genoa.



Prof. Sergey Y. Yurish

International Frequency Sensor Association (IFSA)

**“Artificial Intelligence-Enabled Smart Sensor Systems:
Bottom-Up & Hardware-Software Codesign”**

Professor Yurish is a president and co-founder of International Frequency Sensor Association (IFSA) and Sensors Web Portal, Inc. (Canada). He is an Editor-in-Chief of Sensors & Transducers journal, Magazine (e-Digest) and IFSA Newsletter. Sergey Yurish was a Marie Curie Chairs Excellence investigator in Technical University of Catalonia (UPC, Barcelona, Spain) in 2006-2009, where he has lead and developed one of the most successful projects in the UPC on Smart Sensors Systems Design (SMARTSES), totaling 425,000 EUR. His professional accomplishments also include Senior Research Fellowship at Open University of Catalonia (UOC, Barcelona, Spain) where he spent a one year in 2009 - 2010.

Prof. Yurish has over 25 years of research and academic experiences during which he has developed numerous projects on international level in frames of various programmers, including NATO, FP6 and FP7. He was a Head of R&D Department in Institute of Computer Technologies, UA in 1999-2002. His research interests include self-adaptive intelligent sensors systems, novel methods for frequency measurements and adaptive frequency-to-digital conversion. The future plans include research and developments in the area of smart sensor systems integration platform. Sergey Yurish is an author of three articles, which have received the Best Articles Awards in 2007-2009 and a paper receiving the Best Paper Award at the 2nd International Conference on Advances in Circuits, Electronics and Micro-electronics2 (CENICS) IARIA conference in 2009.

Prof. Yurish is an Advisory Chair of SENSORDEVICES' 2010, SENSORCOMM' 2010 and CENICS' 2010 IARIA conferences and a member of Technical Program Committee of CENICS' 2008, 2009, 2010 and SENSORDEVICES' 2010 conferences. He has also served as an International Advisory, Scientific and Programme Committee member of numerous other conferences such as Programmable Devices and Embedded Systems (PDeS), International Conference on Control, Instrumentation and Mechatronic Engineering (CIM), International MEMS Conference (iMEMS) and IEEE International Workshop on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS), and has also contributed as keynote speaker. He holds 9 patents and has published 160 research papers and articles in peerreviewed international journals, workshops, conferences and symposiums, including four books published by John Wiley & Sons, Kluwer and Springer. Prof. Yurish is a member of IMEKO Technical Committee TC7 'Measurement Science', regional representative of Electrical Journal and a member of various professional organizations.



Dr. Mikhail S. Kupriyanov

*Doctor of Technical Sciences, Professor,
Head of the Department of Computer Engineering,
Saint Petersburg Electrotechnical University “LETI”*

**“Development of Hardware Solutions
for Artificial Intelligence Systems at ETU “LETI”**

Mikhail Kupriyanov is an expert in the field of intellectual methods for data and process analysis, artificial intelligence, and embedded systems. In 1977 he defended a PhD in the area of embedded system design; in 1988 he defended a doctorate thesis in the area of fault-tolerant and artificial intelligent systems design. In 1991 he gained the title of full-time professor.

Since 1993 he has been working in the position of professor at the Department of Computer Engineering (Saint Petersburg Electrotechnical University “LETI”) since 2015 he is a head of the Department.

Since 2010 he has been occupying the position of the head of the Computer Technologies and Informatics Faculty (Saint Petersburg Electrotechnical University “LETI”)

Since 2018 he has been occupying the position of the Director of Education Department (Saint Petersburg Electrotechnical University “LETI”)

Since 2021 he has been occupying the position of the head of Scientific and Educational Directions (Saint Petersburg Electrotechnical University “LETI”)

Mikhail Kupriyanov is Co-Founder and Scientific Director of Alexander Popov International Innovation Institute for Artificial Intelligence, Cybersecurity and Communications.

The key challenge of the institute is to achieve world leadership in fundamental and applied research in artificial intelligence and to organize the World Centre of AI Competency in the creation of AI-driven solutions for industry in St. Petersburg.



Dr. Kseniia V. Sapozhnikova

IMEKO TC7 Member, Deputy head of the laboratory “Computerized sensors and measuring systems”, “D.I. Mendeleyev Institute for Metrology” (VNIIM) which is the State Research Centre of the Russian Federation

“Artificial Intelligence in Measuring Systems. The Need for Standardization.” (Roald Taymanov, Kseniia Sapozhnikova)

Participation in developing scientific projects:

1970–1974, methods and instruments for reproducing and measuring small time intervals; 1972–1978, methods and devices for calibrating radiolocation systems, including the development of a measurement standard for calibrating the system for docking the spacecrafts “Apollo-Soyuz”; 1973–1979, methods and devices for measuring gaps and relative displacements inside turbines; 1976–1985, methods and measuring instruments for the National measurement standards of the acceleration unit; 1980 to present day, intelligent sensors, intelligent measuring systems and methods for metrological self-check of measuring instruments built in various equipment (measurement of displacement, temperature, pressure, level of liquid, flow rate, specific electrical conductivity, force, etc., including those for NPPs and HEPPs); 1995–2007, intelligent system for measuring displacement of a control rod for NPPs; technology intended to increase the reliability and lifetime of control rod drives operating inside nuclear reactors; 2001 to present day, methods for decoding emotional impact of acoustic signals upon people as well as diagnosing brain development on the basis of baby’s vocalisations; 2008–2013, complex of State standards in the field of measuring instruments and systems with the metrological self-check related to the State system for ensuring the uniformity of measurements.

Major research interests:

Measurements of non-electric quantities under harsh environment; metrological reliability; measurements in the humanitarian field, measurement of emotions, Internet of Things, image recognitions, acoustic signal analysis, measurement of music impact on listeners.

Academy memberships/Professional membership and service:

2009 to present day, Member of the International Committee on Measurements and Instrumentation (ICMI);

2011 to present day, Member of the Editorial Board of the “Sensors and Transducers” Journal.

2018 to present day, Member of IMEKO TC 7 “Measurement Science”

2019 to present day, Member of the Editorial Council of the “Soft Measurement and Computing” Journal

Publications and granted patents:

All in all: author or co-author of about 250 research papers (about 110 papers in English, 15 papers published abroad in Russian); in Web of Sc. – more than 15, RSCI – about 105, Scopus – more than 40; co-author of 8 books. All in all: more than 20 patents of the Russian Federation or inventor’s certificates.



Dr. Roald Ye. Taymanov

IMEKO TC7 Member, Head of the laboratory “Metrological maintenance of computerized sensors and measuring systems”, “D.I. Mendeleyev Institute for Metrology” (VNIIM) which is the State Research Centre of the Russian Federation

“Artificial Intelligence in Measuring Systems. The Need for Standardization.” (Roald Taymanov, Kseniia Sapozhnikova)

Leadership in developing scientific projects:

1960–1970, theory and methods of signal conversion as well as devices for radio communication systems; 1969–1974, methods and instruments for reproducing and measuring small time intervals; 1972–1978, methods and devices for calibrating radiolocation systems, including the development of a measurement standard for calibrating the system for docking the spacecrafts “Apollo-Soyuz”; 1973–1979, methods and devices for measuring gaps and relative displacements inside turbines; 1976–1985, methods and measuring instruments for the National measurement standards of the temperature unit and acceleration unit; 1980 to present day, intelligent sensors, intelligent measuring systems and methods for metrological self-check of measuring instruments built in various equipment (measurement of displacement, temperature, pressure, level of liquid, flow rate, specific electrical conductivity, force, etc., including those for NPPs and HEPP); 1995–2007, intelligent system for measuring and controlling displacement of a control rod for NPPs; technology intended to increase the reliability and lifetime of control rod drives operating inside nuclear reactors; 2001 to present day, methods for decoding emotional impact of acoustic signals upon people as well as diagnosing brain development on the basis of baby’s vocalisations; 2008–2013, complex of State standards in the field of measuring instruments and systems with the metrological self-check related to the State system for ensuring the uniformity of measurements.

Major research interests:

Measurements of non-electric quantities under harsh environment; measurement trustworthiness, measurements in the humanitarian field, measurement of emotions, Internet of Things, image recognition, acoustic signal analysis, measurement of music impact on listeners.

Academy memberships/Professional membership and service:

1998 to present day, Full member of the Metrological Academy, the Russian Federation; 2009 to present day, Member of the International Committee on Measurements and Instrumentation (ICMI); 2011 to present day, Member of the Editorial Board of the “International Journal on Advances in Systems and Measurements”. 2018 to present day, Member of IMEKO TC 7 “Measurement Science” 2019 to present day, Member of the Editorial Council of the “Soft Measurement and Computing” Journal.

Publications and granted patents: All in all: author or co-author of about 330 research papers (more than 110 papers in English, 15 papers published abroad in Russian); in Web of Sc. – more than 20, RSCI – about 140, Scopus more than 50; co-author of 8 books.

All in all: more than 50 patents of the Russian Federation and inventor’s certificates.



Dr. Vadim V. Borisov

Dr. habil. of Engineering Sciences, Professor, President of the Russian Association of Artificial Intelligence, National Research University "Moscow Power Engineering Institute" (the branch in Smolensk)

"Fuzzy Cognitive Models are the Basis for Intelligent Analysis of Cyber-Physical Systems and Processes"

WORK EXPERIENCE

Vadim Borisov graduated from the Moscow Power Engineering Institute, Department of Computer Engineering in 1986.

In 1991, he defended his dissertation as a candidate of technical sciences.

In 1997, he defended his dissertation as a doctor of technical sciences.

In 2000, he became a professor of the National Research University "Moscow Power Engineering Institute" (the branch in Smolensk).

He is currently also a professor of the National Research University "Moscow Power Engineering Institute".

His research spans areas: intellectual decision-making support; fuzzy systems and soft computing; intelligent analysis, modeling, monitoring and forecasting of complex systems and processes; associative memory, associative systems of storage and processing of the information and knowledge.

MEMBERSHIPS

- President of the Russian Association of Artificial Intelligence,
- President-elect of the Russian Association of Fuzzy Systems and Soft Computing.

PUBLICATIONS

- Borisov V., Kotov D., Molyavko A. Intelligent information search method based on a compositional ontological approach // In: Kuznetsov S.O., Panov A.I., Yakovlev K.S. (eds) Artificial Intelligence. RCAI 2020. Lecture Notes in Computer Science. 2020. Vol. 12412. Springer, Cham. https://doi.org/10.1007/978-3-030-59535-7_27.
- Borisov V.V., Misnik A.E., Krutalevich S.K., Prokopenko S.A. Automation Methodology for Complex Technical-Organizational Systems // Proc. of the 5th International Conference on Information Technologies in Engineering Education (Inforino-2020), Moscow, Russia, 2020, pp. 1-6. doi: 10.1109/Inforino48376.2020.9111813.
- Meshalkin V.P., Bobkov V.I., Borisov V.V., Dli M.I. Hybrid Fuzzy Differential-Production Model of the Dynamic Drying of a Pellet under Uncertainty // Doklady Chemistry, 2020, Vol. 494, Part 2, pp. 166-169. DOI: 10.1134/S0012500820100055.



Valery B. Tarassov

Associate Professor of CIM Department at the Bauman Moscow State Technical University, President of Russian Association for Fuzzy Systems and Soft Computing, Member of Scientific Council of Russian Association for Artificial Intelligence

"From Industry 4.0 to Industry 5.0: A New Challenge for Artificial Intelligence"

Valery B. Tarassov was graduated from Bauman Moscow Higher Technical School (actually Bauman Moscow State Technical University, BMSTU) in 1978. He received his PhD in 1982. The title of his dissertation was «Development of Fuzzy Mathematics Models for Design and Engineering Works». In 1978-1992 he has been working with various departments of Bauman Moscow Higher Technical School. In the late 1970's-1980's he also has been working on a part-time basis at the Institute of Psychology of Academy of Sciences.

Since 1992 he is the associate professor at CIM department of BMSTU. Actually he is the deputy director of CIM department responsible for research work.

Dr Valery B. Tarassov was also Professor at the Department of Information Technologies of Tsiolkovsky Russian State Technological University «MATI». Besides, he delivered lectures at Applied Mathematics Department of Moscow Power Engineering Institute (Technical University) and IBS Master Courses. He was the supervisor of 9 PhD. From 1995 to 1997 he was a visiting professor at the University of Valenciennes and Hainaut-Cambresis (France).

He is the author or co-author of 8 books (in Russian): «Methods and Languages for Ontological Modeling» (2017); «Soft Computing and Measurement» (2017); «Approaches to the Modeling of Thinking» (2014); «Mathematical Psychology» (2010); «Fuzzy Hybrid Systems» (2007); «From Multi-Agent Systems to Intelligent Organizations» (2002); «Intelligent Tutoring Systems and Virtual Educational Institutions» (2001); «Fuzzy Sets in the Models of Control and Artificial Intelligence» (1986). His first Russian monograph on multi-agent systems «From Multi-Agent Systems to Intelligent Organizations» awarded in 2004 by Russian Association for Artificial Intelligence as the best book in AI and its applications.

He is the Co-Editor of the Proceedings of the International Conferences on Intelligent Information Technologies for Industry (2016-2019) published in Advances in Intelligent Systems and Computing, and the organizer of the 1st BMSTU plenary session on Industry 4.0 strategies at the International Conference on Intelligent Systems and CIM on January 26, 2019. He delivers invited talks on Industry 4.0 and its technologies since 2018.

Prof. Valery B. Tarassov is the author of more than 300 papers, including more than 50 papers in English. About 30 papers were included into Scopus and WoS.



Dr. Franco Pavese

Chairperson of the Technical Committee TC21

“Mathematical Tools for Measurements” of the international Association IMEKO

“Some Current Key Metrological Problems: Understanding the New SI (2018) and Implications of a Possible Information Approach”

FRANCO PAVESE is born in Torino, Italy on 6 January 1942.

STUDIES – Full University Degree in Engineering at the Politecnico of Torino on 4 April 1966. Scientist with Consiglio Nazionale delle Ricerche (CNR) from July 1967 at Istituto di Metrologia “G.Colonnetti” (IMGC). Research Director in Metrology since 1990.

(From 2006 IMGC-CNR is part of the new Istituto Nazionale di Ricerca Metrologica (INRIM – National Institute for Research in Metrology)).

Retired since 2009, with several functions still active—see below in bold.

SCIENTIFIC ACTIVITIES – His activities mainly concerned primary and applied metrology at an international level and with several scientific co-operations with many Countries—see below. Since 1971 to retirement he has been the responsible for a Research Group at IMGC, then at INRIM.

Since 1975 he has been the responsible in total of **15 national scientific Contracts**, some with large resources, in CNR Finalised and Strategic Projects. From 1994 he has been the co-ordinator and responsible of **further 17 international research Contracts**, of which 6 with the European Commission. He also stipulated Contracts with 14 foreign Laboratories.

He is the author, alone or with co-authors, of **229** full international scientific papers, plus **93** international conference papers and **21** books, book chapters or monographs in English. He has a good citation rate compared with scientists in the metrological field.

He has been also Editor of **23** books (12 from the Conference Series AMCTM) and of Journal Special Issues, most international, and 68 are his Seminars or Lessons in Schools, almost all invited, of which 41 abroad.

His main scientific contributions of international level have been:

- **physical-chemistry & metrology**
- discovery of **new phase transitions** in condensed **ethane** and **propane**, and improvement of a factor 100 of the uncertainty in the knowledge of **some physical-chemical properties** of condensed **deuterium**;
- understanding of the main reason of the variability of the standards based on the temperature of the triple point of **hydrogen** and **neon**, with results now adopted in the ITS-90, and

demonstration that it was due to the sample-to-sample **isotopic variability**, with improvement of the uncertainty of the realisations of a factor of 5;

- understanding of the main reason of the variability of the realisations of the triple point of oxygen, found due to the presence of argon as a chemical impurity, and studies of the two solid-to-solid phase transitions of oxygen as a mean to reduce of a factor 2-3 that variability;
- extension of the **sealed-cell technique** to the calorimetric realisation of the phase transitions of condensed gases. This technique was considered since the '70s a breakthrough and is now internationally used, with an improvement of a factor >30 of the standards uncertainty. More than **200** sealed cells were built, of which **87** provided or sold to other Laboratories in the whole World;
- use of the triple points as **pressure fixed points**;
- use **³He for cryogenic gas thermometry** from 1 K up, and realisation of a dead-volume free ICVGT using a precision cryogenic absolute/differential pressure transducer;
 - **cryogenic engineering & metrology**
- development of **new cryogenic transducers**, not only for temperature;
- development of magnetic shielding and other low-Jc applications using high-temperature super-conductors, deposited in thick films of as bulk MgB₂, for cryogenic (magnetic shielding) and metrological (Cryogenic Current Comparator) applications.
 - **mathematics, statistics and terminology**
- startup and establishment at the international level of a permanent frame for the development of advanced mathematical, statistical and computational tools specific for metrology, testing and measurement, funded at European level for more than 10 years (SofTools and International Conferences **AMCTM** 1993–2020), from 2004 within **IMEKO** (TC21).
- contribution to chemical-physical terminology within **IUPAC** (Green Book) and of written standards within **ISO TC69**, **UNI** and **CEI**.

Main International functions at present

- Chairperson of the Technical Committee TC21 “Mathematical Tools for Measurements” of the international Association IMEKO