

# Curriculum Vitae

01.01.2020

**Sándor Imre**, corresponding member of Hung. Academy of Sciences

**BIRTH:** Budapest, Hungary, 23.06.1969

## CURRENT POSITION

2009- Professor, Head of Department of Networked Systems and Services, Budapest University of Technology and Economics (BME)  
2005-2020 R&D Director of Mobile Innovation Center, Hungary

## ADDRESS

Department of Networked Systems and Services, Budapest University of Technology and Economics  
Magyar Tudósok krt. 2.  
Budapest,  
Hungary-1117.  
Tel: (+36) 1 463-3261, Fax: (+36) 1 463 3263,  
Email: IMRE@hit.bme.hu

## EDUCATION and DEGREES

2019 Corresponding member of Hungarian Academy of Sciences  
2008 Dr. habil., BME  
2007 DSc. Hungarian Academy of Sciences  
Title of the Theses: *Quantum and Classical Methods to Improve the Efficiency of Infocom Systems*  
1999 Ph.D. in Electrical Engineering  
Title of the Theses: *Call Admission Control Methods in ATM Networks*  
1996 dr. univ. in Probability Theory and Mathematical statistics.  
Title of the Dissertation: *Application of Neural Networks for Call Admission Control in ATM Networks*  
1988-1993 M.Sc in Telecommunication Engineering, BME  
Title of the Thesis: "The Asynchronous Transfer Mode"

## EMPLOYMENT

2009- Full professor at Department of Networked Systems and Services (former Department of Telecommunications) BME  
2002-2008 Associate Professor, Department of Telecommunications, BME  
2000-2003 Scientific advisor, Computer and Automation Research Institute of Hungarian Academy of Sciences (MTA SZTAKI)  
1999-2002 Assistant Professor, Department of Telecommunications, BME

1996-1999	Scientific research fellow, Department of Telecommunications, BME
1995-1996	RTD Lab of Real Time Devices (USA) at BME, Topic: development of intelligent data acquiring and signal processing systems
1993-1996	Ph.D. student, Department of Telecommunications, BME

### **MEMBERSHIPS and POSITIONS**

2023-2026	Section of Engineering Sciences of Hungarian Academy of Sciences, chair
2022-	Quantum Internet Alliance Widening Advisory Board member
2020-	Scientific Committee for Computer Sciences of Hungarian Academy of Sciences, member
2020-2025	Quantum Information National Laboratory, Scientific Chair
2020-	IGI International Journal of Telework and Telecommuting Technologies as an Editorial Review Board member 2020-
2020-	Electronics (ISSN 2079-9292) Editorial board memeber, 2020-
2020-2023	Section of Engineering Sciences of Hungarian Academy of Sciences, vice-chair
2020-2022	Member of the Senate of BME
2020-	IET Quantum Communication Associate Editor 2019-
2019-	Expert delegate of Hungary in EuroQCI Board
2016-2017	IEEE WIRELESS COMMUNICATIONS LETTERS, editor
2015-	Member of the Scientific Board of BME
2015-	Association for Computing Machinery (ACM), member
2015-	Coordinator of BSc Education in Electrical Engineering at the Faculty of Electrical Engineering and Informatics, BME
2015-2018	Evaluation Board of the Hungarian Scientific Research Found, member
2014-2020	Doctoral Board of Hungarian Academy of Sciences
2013-2019	Board of Advisors of the Hungarian-American Enterprise Scholarship Fund, <i>Member</i>
2011-	Hungarian IPv6 Forum, <i>Chairman</i>
2010-	Infocommunications Journal (ISSN 2061-2079), <i>Editor</i>
2010-2016	Assembly of Hungarian Academy of Sciences, <i>DSc. member</i>
2010-	Acoustics Systems Complex Committee of Hungarian Academy of Sciences, <i>member</i>
2010-	Habilitation Committee and PhD Council on Computer Sciences of the Faculty of Electrical Engineering and Informatics, BME
2006-2008	Education Committee of the Faculty of Electrical Engineering and Informatics, BME
2005-2020	Scientific research director, Mobile Innovation Center of BME

2005-2010	Telecommunications (journal in Hungarian), <i>Editor</i>
2003-2006	Education Committee Accreditation and Advisory Board of the Faculty of Electrical Engineering and Informatics, BME
2002-	Scientific Committee for Telecommunications of Hungarian Academy of Sciences, ( <i>member 2002-, Secretary 2004-2011, Chairman 2011-2017</i> )
2001-2010	Hungarian Telecommunications (journal in Hungarian), <i>Editor</i>
2000-	The Institute of Electrical and Electronics Engineers (IEEE), ( <i>member 2000-2012, senior member 2012-</i> )
1999-	Ph.D. Board of Hungarian Academy of Sciences, <i>member</i>
1998-2005	Inter University Research Centre for Telecommunications and Informatics (ETIK), <i>Head of research team</i>
1998-	Hungarian Scientific Association for Infocommunications, <i>Secretary of Education Committee (2001-2002), Head of Education Committee (2002-2005), Member of Steering Committee (2012-)</i>
1998-	High Speed Networking Laboratory at BME, <i>Head of research team</i>
1997-	Mobile Communications Laboratory at BME, <i>Founder and Scientific manager</i>
1996-	National Geographic Society, <i>Member</i>

### SPOKEN LANGUAGES

English,  
German,  
Hungarian

### AWARDS and SCHOLARSHIPS

2023	Gold medal award of the Hungarian Scientific Association for Infocommunications
2021	Szent-Györgyi Albert-Award for outstanding education activities
2017	Award of the Hungarian Academy of Sciences
2016	Pollák-Virág Publication Award of the Hungarian Scientific Association for Infocommunications
2015	Á. Milánkovich, G. Ill, K. Lendvai, S. Imre, S. Sándor: Research on Payload Aggregation of Packets in WSNs, In: SENSORNETS 2015: Proceedings of the 3rd International Conference on Sensor Networks. Angers, France, 11-13 February 2015. Paper 50 <b>BEST PAPER AWARD</b>
2012-	<i>Senior member</i> of the Institute of Electrical and Electronics Engineers (IEEE)
2011	Gabor Dennis Award, Novofer Foundation
2011	Mate Galambos, Sandor Imre: New Method for Representation of Multi-qbit Systems Using Fractals In: ICQNM2011 The Fifth International Conference on Quantum, Nano and Micro

- Technologies, ISBN: 978-1-61208-151-9, Nice, France, 21-27.08. 2011. **BEST PAPER AWARD**
- 2011 Pollák-Virág Publication Award of the Hungarian Scientific Association for Infocommunications
- 2010 Laszlo Kozma Award of BME Dept. of TMIT
- 2010 L Gyongyosi, S Imre: Computational Geometric Analysis of Physically Allowed Quantum Cloning Transformations for Quantum Cryptography, 4th WSEAS International Conference on COMPUTER ENGINEERING and APPLICATIONS (CEA '10). ISBN: 978-960-474-151-9, 27-29 January 2010, Cambridge, USA, pp. 121-126. Paper 18., **BEST PAPER AWARD**
- 2009 Pollák-Virág Publication Award of the Hungarian Scientific Association for Infocommunications
- 2009 Memorial Medal of the Hungarian Scientific Association for Infocommunications for its 60<sup>th</sup> anniversary
- 2009 L Gyongyosi, S Imre: „Quantum Informational Geometry for Secret Quantum Communication”, In: FUTURE COMPUTING 2009, ISBN 978-0-7695-3862-4, Athen, Greece, 15-20 November 2009, pp. 580-585., **BEST PAPER AWARD**
- 2007 Á. Huszák, S. Imre: " TFRC-Based Selective Retransmission For Multimedia Applications", 5th @WAS International Conference on Advances in Mobile Computing and Multimedia, MoMM2007, ISBN 978-3-85403-230-4, pp. 53-63., Jakarta, Indonesia, 3-5 December 2007. **BEST PAPER AWARD**
- 2005 Best speaker of ALCATEL Seminars 2001-2005
- 2005 B. Kovács, M. Szalay and S. Imre: „Modelling and Quantitative Analysis of LTRACK – Novel Mobility Management Algorithm”, 3<sup>rd</sup> Inter. Conf. On Advances in Mobile Multimedia, MOMMS2005, 19-21 September, 2005, Kuala Lumpur, Malaysia, ISBN 3-85403-195-5, in the book serie books@ocg.at band 195 Oesterreichische Computer Gesellschaft, pp. 343-357. **BEST PAPER AWARD**
- 2005 Medal of the Master Teacher Honour, National Council for Undergraduate Research, Hungary
- 2004 Tivadar Puskás Award of the Hungarian Scientific Association for Infocommunications
- 2001 Rector's Excellence Award of BME for supervision of students' scientific research activities, 2001.
- 2001-2003 Hungarian Ministry of Education: György Békésy Post. Doc. Scholarship
- 2001 Accenture Post. Doc. Scholarship
- 1999-2004 Pannon GSM Professor Scholarship
- 1998-2000 Andersen Consulting Research Scholarship
- 1997 General Electric Research Scholarship
- 1995 Award of the MATÁV (Hungarian Telecom Company): "The most successful second year Ph.D. student in electrical engineering"

## **PhD STUDENTS (year degree obtained)**

Máté Szalay PhD, 2007

Vilmos Simon PhD, 2009

Árpád Huszák PhD, 2010

Sándor Szabó PhD, 2011

László Bacsardi PhD, 2012

Borbála Benkő PhD, 2013

Péter Fazekas PhD, 2013

László Gyöngyösi PhD, 2013

Albert Mráz PhD, 2013

Bálint Ary PhD, 2014

Tamás Jursonovics PhD, 2014

László Bokor PhD, 2014

Zoltán Faigl PhD, 2015

Gábor Gulyás PhD, 2015

Péter Fülöp PhD, 2016

Sara El Gaily PhD, 2022

## **TEACHING ACTIVITIES**

Telecommunications, 1997-2002

Introduction into mobile computing, 2000-2008

Mobile telecommunications I., laboratory exercises, 2000-2001

Mobile telecommunications II., laboratory exercises, 2000-2001

State of the art mobile receiver algorithms, 2001-2002

Mobile infocommunication, 2001-2008

Quantum computing and communication, elective, 2001-

Modelling and simulation analysis of mobile systems, 2001-

Mobile telecommunications, laboratory exercises, 2001-2002

Mobile computing, laboratory exercises, 2001-2002

State of the art mobile communication technologies, 2003-

Mobile Infocom Networks, 2009-

Evolution of Mobile Systems, 2010-

Quantum computing and communication, MSC 2016-

Introduction to Quantum Computing and Communications, 2019-

Quantum Computers and its Applications, MSc 2023-

Quantum Communications, MSc 2023-

## SCIENTIFIC PROJECTS

2020-2024	Quantum Information National Laboratory
2017-2021	Development of Quantum Networks - HunQuTech, 2017-1.2.1-NKP-2017-00001
2015-2018	Quantum communications in noisy environment, OTKA K112125
2014-	<i>Quantum Communications – National Future Internet Program, JINKA 2.2, T1C4 -</i>
2013-2015	<i>Information Systems, Research group of the Hungarian Academy of Sciences</i>
2013-2014	Device-free Positioning in Wireless Environment, EIT-KIC
2013-2015	<i>WSN-AQUA: HUSK project, Hungary-Slovakia Cross-border Co-operation Programme</i>
2013-14	Long Distance Secure Quantum Key Distribution, GOP-1.1.1-11-2012-0092
2013-14	Earth-Space Quantum Communications, TAMOP 4.2.2.C
2011-14	CONCERTO - Content and cOntext aware delivery for iNteraCtivemicro-multimEdia healthcaRe applicaTiOns , 2011-2014, EU 7 <sup>th</sup> Framework
2011-2014	TET_10-1-2011-0266, A Two-Tier Cellular Architecture with Robust Interference Capability and Optimal Resource Management Policy, Bilateral project Hungary-Singapore
2011-2013	COST Action MP1006 Fundamental Problems in Quantum Physics
2010-2012	CHIRON – Cyclic and person-centric Health management : Integrated appRoach for hOme, mobile and clinical eNvironments, EU ARTEMIS 2010-2012
2010-2011	RFID technology for supporting logistic systems, TAMOP 421B
2010-2013	Secure Mobile Contactless Payment, BIRD, TECH-09
2009	StoLPaN EU IST program, 2009
2009	Office positioning and navigation system, GOP 1.3.1/B.
2009-2012	EARTH, EU 7 <sup>th</sup> Framework
2009-2012	EULER, EU 7 <sup>th</sup> Framework
2009-2012	SAMURAI, EU 7 <sup>th</sup> Framework
2009-2011	MEVICO-Celtic Mobile Networks Evolution for Individual Communications Experience

2009-2011	Bilateral German-Hungarian Project on Ambient Intelligence Systems (BELAMI II)
2008-2009	EURESCOM P1857, Ultra Flat Architecture for high bitrate services in fixed-mobile convergent networks
2008-2009	Location positioning and object monitoring system based on RFID technology, GOP-1.1.1-07/1-2008-2009
2008-2010	MobileVideo – Live video content generation for community services, NKTH National Technology Program
2009-2011	High intelligence, high reliability reconnaissance system for military and public use, NKTH National Technology Program
2008-2010	OPTIMIX, Optimisation of Multimedia over wireless IP links via X-layer design, EU 7 <sup>th</sup> Framework
2006-2008	ANEMONE, Advanced Next gEneration Mobile Open Network, EU 6th Framework
2006-2008	BIONETS, BIO-inspired NExt generaTion networkS, EU 6th Framework
2006-2008	CASCADAS, Component-ware for Autonomic Situation-aware Communications, and Dynamically Adaptable Services, EU 6th Framework
2006-2008	BOSS, On Board Wireless Secured Video Surveillance, EUREKA-Celtic,
2005-2008	Industrial Applications of RFID Technology, Jedlik-NKFP2/00015/2005
2005-2008	New Measurement Methods for QoS Provisioning Novel Infocom Applications, Jedlik-NKFP2/00015/2005
2005-2008	Bilateral German-Hungarian Project on Ambient Intelligence Systems (BELAMI)
2005-2007	Adaptive multimedia transmission in heterogeneous mobile environment, NKFP project
2004-2006	Greek-Hungarian TET project: Multimedia Transmission in Wireless Local Area Network Environment
2004-2006	ETIK: Coexistence and Interworking Issues of Heterogeneous Mobile Networks
2004-2006	ETIK: Radio Coexistence of Mobile Networks
2004-2006	ETIK: Charging and Billing in 3G/4G Mobile Networks
2004	CoDe-MM: Content-Based Delivery of MultiMedia, CREATENET Research Program
2004	NetMobS: Network-supported Mobility for the Student, CREATENET Research Program
2004	DINA: Dimensioning and Designing Wired and Wireless Access Networks, CREATENET Research Program
2004	ECONET Trilateral international research program on DistriBMEd Medium Access Control
2004	NEXWAY EU 5 <sup>th</sup> Framework project

2003-2007	PHOENIX EU 6 <sup>th</sup> Framework project
2003-2007	NEWCOM EU 6 <sup>th</sup> Framework project
2003-2007	AMBIENT EU 6 <sup>th</sup> Framework project
2003-2006	OTKA T 043375: "Research of mobility supporting technologies in mobil communication and computing"
2003-2005	OTKA TS 044733. "Application of new algorithms and coding procedures in mobile communications and computing"
2003-2006	COST 289: "Spectrum and Power Efficient Broadband Communications"
2003-2006	OTKA F042590: "Research on 4 <sup>rd</sup> Generation Mobile Systems"
2002-2003	QUIPROCONE (Quantum Information Processing & Communications..Network of Excellence) EU 5 <sup>th</sup> Framework Program, Associate member
2001-2004	ETIK: "Research on Wireless Infrastructure and Ad hoc LANs"
2001-2004	ETIK: "Research on IP Mobility Problems"
2001-2004	ETIK: "Research on 3 <sup>rd</sup> Generation Mobile Systems"
2001-2004	COST 279: "Analysis and Design of Advanced Multiservice Networks supporting Mobility, Multimedia, and Internetworking"
2000-2002	CAST EU 5 <sup>th</sup> Framework: "Configurable Radio with Advanced Software Technology"
2000-2002	OTKA F032268: "Research on 3 <sup>rd</sup> Generation Mobile Systems"
1999-2002	COST 262: "Spread Spectrum Systems and Techniques in Wireless and Wired Communications"
1999-2002	FKFP 303/99: "Investigation of Mobile Communication Systems"
1999-2002	OTKA T030651/99: "Investigation of Mobile Communication Systems"
1998-2001	ETIK: "Investigation of CDMA Systems"
1998-2001	ETIK: "Investigation of Wireless ATM Networks"
1998	FKFP 0388/97: "Investigation of Mobile Communication Systems"
1994-1998	COPERNICUS 579: "Research on ATM: Call Admission Control and Network Policing by Neural Networks and Performance Evaluation"
1994-1996	OTKA, F-014456: "Application of Efficient Neural Networks in Telecommunications"

## **STUDIES, COURSES and INDUSTRIAL CO-OPERATIONS**

2020-	Ericsson Quantum project 2020-
2015	Broadband measurements – WIFI discovery, NMHH
2015	QoS measurement in mobile networks, NMHH
2015	Development of RFID systems, Contitech
2013-2015	Development of Quantum key Distribution System



2013-2014	Mobile E-Government Applications, NISZ
2012	Country-wide WLAN coverage, GAMAX
2011	New Approaches of Real-World Virtualization using Micro Projector, Samsung
2010-2011	Platform Structure Specification, NavNGo
2010-2011	Positioning inside buildings, Controlsoft-RIK e
2010	Configurable SIP load sharing, Hungarian Telekom
2010	RFIDMOBP, Mobile Engine
2010	Jobcontrol application, TCT,
2010	Call-mix application, TCT
2010	3G Radio Access Network Dimensioning, Hungarian Telekom
2009-2011	IMS based new generation community mobile services, ITWARE, GOP 2008/2-1.3.1
2009	ALCATEL LTE course
2009	Effect of IMS QoS parameters on the quality of Multimedia Telephony Service, Hungarian Telekom
2009	Audit of telecommunication system of MVM Group central building
2009	3G Radio Access Network Dimensioning, Hungarian Telekom
2009	MESH WIFI, BIRD
2009	<i>Remote access of medical instrument</i> , BB Raun, 2009
2009	Development of Mobile Networks to Support User Experience, Nokia Siemens Networks, 2009
2009	Automatic testing of Fax and VoIP services, Hungarian Telekom PKI, 2009
2008	IMS system testing, Hungarian Telekom
2008	3G Radio Access Network Dimensioning, Hungarian Telekom
2008	NFC – Near Field Communication, Hungarian Telekom
2008	RFID based shopping cart
2008	IMS based fix-mobile convergence Hungarian Telekom
2008	Development of hosted multimedia Contact Center in IMS environment, TCT
2008	IMS based new generation multimedia community mobile services, ITWARE
2007	Investigation of IMS compatibility of various SIP equipment, AVAYA
2007	SIP clients behind NAT - TcT Hungary Kft., 2007
2007	3G Radio Access Network Dimensioning, T-COM (Mobile)
2007	IMS-based integrated messaging system, T-COM (PKI)
2007	Click-to-dial service in IMS-based environment, T-COM (PKI)

2007	Skype-SIP gateway, TcT Hungary Kft.
2007	Call information processing in TETRA, Pro M Zrt.
2006	3G Radio Access Network Dimensioning, T-COM (Mobile)
2006	Interactive Mobile Extension of Broadcasting System of ATV, T-COM (Mobile)
2006	Interactive Mobile Extension of Broadcasting System of TV2, T-COM (Mobile)
2006	Mobile Communication System for Public Transportation. BKV
2006	Comparison of ATCA Platforms, T-COM (Mobile)
2006	IMS-based Security Solutions, T-COM (Mobile)
2006	IMS Application Development Platform, T-COM PKI
2006	State of the Art Mobile Technologies training, ALCATEL
2005	WIMAX training, ALCATEL
2004	UMTS training, ALCATEL
2005	UMTS training, Vodafone
2005	2,5G Radio Access Network Dimensioning, T-COM (Mobile)
2004	WLAN training, ALCATEL
2004	Access Solutions in Next Generation Networks, Hungarian Telecom
2004	Mobile Banking Solutions, GIRO
2004	Measurement Techniques for RLAN Networks, National Telecommunications Agency
2004	UMTS-GSM/GPRS/EDGE Access Network Planning, T-Mobile
2004	EDR Systems, tender preparation, contractor: ERBE
2004	PKI Security Systems, Study, contractor: IKTA-E-GROUP
2004	GPRS training, contractor: National Telecommunications Agency
2004	UMTS training, contractor: ALCATEL
2004	UMTS training, contractor: SYSDATA
2003	Bluetooth training, contractor: Elcoteq
2002-2003	R&D on Peer-to-peer infocom system, Deutsche Telecom – T-Systems
2001	Translation of ETSI telecom standards, contractor: Hungarian Telecommunication Authority
2001	Preparing multimedia course: “Mobile Telecommunication Systems”, contractor: MATÁV PKI
2000-2001	GPRS Gateway Project, contractor: EADS - European Aeronautic Defence and Space Company
2000-2001	SIP Handover and IP Micro Mobility Project, contractor: EADS - European Aeronautic Defence and Space Company

2000	Comprehensive study of access networking technologies, contractor: Business Communication Networks Ltd.
2000	Comprehensive study of access networking technologies, contractor: Business Communication Networks Ltd.
2000	Comprehensive study of the future of mobile telecommunications, contractor: MATÁV PKI
2000	Study of GPRS System, contractor: PANTEL
2000	Teaching the course and writing lecture notes: "IP Mobility", contractor: Westel
2000	Teaching the course and writing lecture notes: "GSM System", contractor: Rohde&Schwarz
1999	Investigation of TETRAPOL field trial systems in Budapest, contractor: Ministry of Interior Affairs
1999	Comprehensive study of speech compression techniques in mobile telecommunications, contractor: NETI
1999	Translation of ETSI telecom standards, contractor: Hungarian Telecommunication Authority
1999	Examination and evaluation of the effects of GSM on aircraft landing system of Hungarian Air Force, contractor: Hungarian Telecommunication Authority
1999	Teaching the course and writing lecture notes: "TETRA System", contractor: Antenna Hungária
1999	Investigation of TETRA field trial systems in Budapest, contractor: Antenna Hungária
1998	Comprehensive Study of the European and Hungarian Mobile Market, contractor: Westel 450
1997	Teaching the course and writing lecture notes: "Basics of Mobile Telecommunication Systems", contractor: Business Communication Networks Ltd
1997	Study of TETRA Networks, contractor: ENTEL
1994	Study of ATM Networks, contractor: MATÁV
1993	Study of ATM Networks, contractor: MATÁV

## RESEARCH AREAS

- Wideband radio technologies: DS-CDMA, MC/CDMA, OFDM, etc.
- IP mobility. routing, reliability, security
- Wireless LANs and their ad hoc extensions
- GSM-UMTS-LTE
- Software Defined Radio
- Smart metering
- RFID and near field communication
- Billing in packet-based mobile systems
- Mobile Agents

- Quantum Communications and Computing

Dr. Sándor Imre