

# CURRICULUM VITAE

MARTÍN VARELA RICO

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## CONTACT INFORMATION

Phone: (+358) 400 236 420

Email: [martin@varela.fi](mailto:martin@varela.fi) – [mvr.rennes@gmail.com](mailto:mvr.rennes@gmail.com)

Web: <http://martin.varela.fi>

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## PERSONAL INFORMATION

Date of birth: January 8th, 1978.

Place of birth: Montevideo, Uruguay.

Nationalities: Uruguayan, Finnish.

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## EDUCATION

10/2002–11/2005 PhD (Computer Science) at Université de Rennes 1, Rennes, France.

Title: *"Pseudo-subjective Quality Assessment of Multimedia Streams and its Applications in Control"*.

Advisor: Prof. Gerardo Rubino.

This work was financed by a French Government grant.

9/2001–7/2002 MSc (Computer Science - Networks and Systems) Université de Rennes 1, France.

Title: *"Quality Assessment of a Multimedia Stream Transported Over the Internet"*.

Advisor: Prof. Gerardo Rubino.

4/1996-4/2001 Computing Engineering, Universidad de la República, Uruguay.

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## WORK EXPERIENCE

03-2017 – Senior SW Engineer at callstats.io. I work in the analytics team, where I develop our understanding of QoE for WebRTC services.

02/2017–07/2017 Senior Systems Engineer at EXFO. I work in the Network Function Virtualization (NFV) team, for Service Assurance. My role is to guide the design EXFO's SA solutions for NFV. In Spring 2017, EXFO decided to cease all NFV-related activities in Finland, and this work was cut short.

9/2013–02/2017 Principal Scientist at VTT. Network Performance team. At VTT I have led the work on QoE research, both in scientific and commercial contexts, over the past 10 years.

9/2014–11/2014 Visiting Senior Research Fellow at the Cooperative Systems group, Faculty of Computer Science, University of Vienna.

6/2007–8/2013 Senior Scientist at VTT. Quality of Service Technologies team.

4/2009–12/2009 Founder and CTO at MOS4 Oy.

12/2005–5/2007 Ercim post-doctoral fellow. From 12/2005 to 9/2006 I worked at the Computer and Networks Architectures laboratory of the Swedish Institute of Computer Science (SICS). I then worked from 9/2006 until 5/2007 at VTT in Oulu, Finland, in the Quality of Service Technologies team.

11/2002–2/2005 Lab monitor at École National Supérieur de Télécommunications de Bretagne (ENST Bretagne) for networking courses.

10/1999–10/2003 Teaching Assistant at the Computer Science Institute of the School of Engineering, Universidad de la República, Uruguay.

I have worked there on Computer Architecture and Operating Systems courses.

8/2000–5/2001 Systems Analyst at the Informatics Division of the Uruguayan Department of Justice (Poder Judicial, División Informática).

Duties included the specification of requirements and design of the institution's web portal and maintenance tools, and network design and security.

1/2000–5/2001 Consultant work, freelance programming, training courses on Object-Oriented programming and Java programming for enterprises.

12/1998–12/2000 Teaching Assistant / Lecturer at the Instituto Universitario Autónomo del Sur, Montevideo, Uruguay.

I have worked on Programming, Software Engineering, and Compilers courses, and also in summer labs.

4/1998–12/1999 Computing teacher at an elementary school (Colegio Bilingüe Ciudad Vieja), Montevideo, Uruguay.

3/1998–2/1999 English teacher at the Uruguayan Military High-school (Liceo Militar General Artigas), Montevideo, Uruguay.

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## SKILLS

I am familiar with a number of technologies, tools and programming languages. In my daily work, I use mostly Ruby, Haskell, git, R,  $\LaTeX$ , C, Bash/Zsh, sed/awk, ex, SQL, gnuplot, and Lisp (mostly Clojure and Emacs lisp, but I am also familiar with Common Lisp). I also have some experience in C++, Java, x86 and Sparc assembler, some Python and Perl.

Besides my work on QoE and QoS management, I have done work on Unified Communications, QoS (measurement techniques, monitoring, model-based performance analysis). Before moving to EXFO, I had started looking into SDN-based approaches for implementing QoE-driven network management. Over the past year, I have become well acquainted with NFV technologies and architectures (in particular ETSI NFV MANO for management and orchestration).

I can work comfortably with the major OS environments (though I much prefer Mac OS and Linux).

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## PARTICIPATION IN EUROPEAN PROJECTS AND INDUSTRIAL PARTNERSHIPS

03-2016–02-2017 H2020 FUTEBOL.

Participants: VTT, Intel, Trinity College Dublin, U. Bristol, Federal University of Rio Grande Do Sul, Federal University of Ceará, among others.

Duties: In charge of implementing testbed federation tools into VTT's 5GTN and LSA platforms. This involves mainly an SDN-based control framework and federation APIs for integrating lab resources into the FED4FIRE system. Leading a showcase related to LSA implementation and QoE aspects of the convergence of optical and wireless networks.

03-2015–05-2016 Celtic-Plus NOTTS.

Participants: VTT, Orange Labs Poland, Acreo, Anvia, among others.

Duties: Scientific coordination and WP5 leadership. Development of QoE models and management mechanisms for OTT video traffic.

06/2012– Contract research for the European Space Agency – “QuoTe – Quality of Experience for Telemedicine Applications”.

Duties: Project preparation (all technical aspects) and management. Development of quality models for telemedicine video-based applications. Creation of a system for measuring and monitoring the quality of said applications.

11/2011–03/2015 Celtic-Plus QuEEN (Winner of the Celtic-Plus Excellence Award for Services and Applications, 2016).

Participants: VTT, Orange Labs, Deutsche Telekom Labs, INRIA, EXFO, IBBT, ftw, among others.

Duties: Project scientific coordination. Development of QoE monitoring framework for generic services (with a focus on Cloud services).

01/2011–04/2013 Celtic IPNQSIS (Winner of the Celtic-Plus Innovation Award, 2016).

Participants: VTT, Indra, Alcatel Lucent, Ericsson, INT ParisSud, IP-Label Newtest, among others.

Duties: Finnish consortium coordination, development of QoE metrics and QoE-based network management algorithms for streaming media (mobile IPTV in particular). Work-package leadership.

2010–2012 Several contract research projects for Nokia Siemens Networks.

Participants: VTT, NSN Munich

Duties: Studies on the quality of mobile video services (both over-the-top and managed). Responsible for the project preparation and management.

11/2010– COST Action QUALINET (IC1003).

Participants: VTT, EPFL, ftw., Orange Labs, INRIA, among others. Duties: Finnish representative to the management committee. Finnish coordination for QoE activities.

4/2010–12/2010 FP7 IST OptiBand.

Participants: VTT, ftw., Telecom Italia, Thomson GrasValley, among others.

Duties: Consulting for HDTV QoE measurement.

5/2008–4/2009 Celtic Scalnet.

Participants: VTT, Sanoma Entertainment, Moviquity, University of Murcia, among others.

Duties: Celtic-level technical coordination of the project (12/2008–4/2009). Development of novel mechanisms to exploit Scalable Video Coding (SVC) properties in different networking contexts, and to develop a QoE-based approach to perform content and network-level adaptation.

1/2009–9/2011 CELITC Easy Wireless 2.

Participants: VTT, EXFO-NetHawk, Moviquity, UC3M, among others  
Duties: QoS monitoring tool development, QoE-based mobility management, passive network monitoring across NATs.

2008–2009 Contract research for 7Signal Oy.

Participants: VTT, 7Signal

Duties: Creation of an active, PSQA-based VoIP QoE measurement system for integration in 7Signal's Sapphire monitoring platform. Responsible for the project preparation and management.

9/2006–10/2008 ITEA Easy Wireless.

Participants: VTT, Telefonica, Thales, University of Twente, Nethawk, among others.

Duties: development of a user-level QoS monitor to be included into a network performance measurement tool. Assessment of new wireless systems' fitness for VoIP (e.g. UMA, Skype on mobiles).

4/2004–11/2005 LAFMI. Franco-Mexican cooperation program.

Participants: INRIA, ENST Bretagne, ITAM, CONACYT, among others.

Duties: joint work on the quality assessment of H.264 video transmitted over DiffServ-aware and UMTS networks.

6/2004–11/2005 EuroNGI NoE.

Participants: INRIA, GET, University of Vienna, KTH, Politecnico de Torino, among others.

Duties: participation in working group WP.JRA.6.1 (Quality of service from the users' perspective and feedback mechanisms for quality control)

3/2003–6/2004 Partnership INRIA / France Télécom R&D for a comparative assessment of Real Audio 9 and Windows Media 9 codecs and players for high quality audio streaming over the Internet.

Participants: INRIA, France Télécom R&D.

Duties: development of a wide-area network emulator for the tests, media samples generation and treatment of the data obtained.

1/2003–6/2004 IST FABRIC

Participants: Philips, INRIA, Thomson Multimedia, University College of London, Technische Universiteit Eindhoven, among others.

Duties: proposals for multimedia streaming quality assessment.

7/2001–2/2002 ITEA RTIPA

Participants: Philips, Ericsson, INRIA, France Télécom R&D, Siemens, Technische Universiteit Eindhoven, among others.

Duties: test and validation of a flow control protocol for ATM networks in a ring topology. Development of a simulator to perform said tests and validation.

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## PROFESSIONAL ACTIVITIES

I am currently co-chair of the IEEE MMTC's QoE Interest Group (<http://mmc.committees.comsoc.org/interest-groups/qoeig/>). Since June 2015, I am also an Level-1 Associated Researcher in the Uruguayan SNI (<http://www.sni.org.uy/>). I was a member of the IEEE 1907.1 standardization group for "Network-Adaptive Quality of Experience (QoE) Management Scheme for Real-Time Mobile Video Communications".

I am an associate editor for Springer's recently founded "Quality and User Experience" journal, and was involved in its founding.

I am active in a number of program committees and have provided reviews for a large number of venues. Recent activities include:

- Guest editor for ACM TOMM, special issue on QoE Management (2017), Publicity Chair for QoMEX 2018
- TPC Chair for IEEE IM 2017 Workshop of QoE Management, TPC member for QoMEX 2017, ACM SIGCOMM/Internet-QoE 2017
- General co-chair for ACM SIGCOMM Workshop on QoE-based Analysis and Management of Data Communication Networks (Internet-QoE 2016)
- TPC member for PQS 2016, IEEE ICCE 2016, QCMan 2016, ITC28, ACM MMSys 2016

- Special session chair and TPC member for QoMEX 2016
- Editor for IEEE MMTC E-Letter 10(3), special issue on "QoE Management for Next Generation Multimedia Services"
- Publicity chair for QoMEX 2015
- General co-chair for IEEE QoENAM 2014
- TPC member for ACM MultiMedia 2014, QoMEX 2014, ICC'14 (CSSMA), Globecom QoEMC 2013
- TPC co-chair for QoMEX 2013
- Special session organizer and TPC member for IEEE Eurocon 2013 "From QoS to QoE and Back"
- TPC member for ICME 2012-2014 (awarded as one of the "Quality Reviewers" for ICME 2013), TPC member for IWQM 2013 (co-located with IEEE SaCoNet 2013)
- Guest editor for JCNC special issue "Improving QoS and QoE for Mobile Communications"
- Various reviews / TPC memberships for IEEE J-SAC, Internet Computing, Springer MTAP, MMSP 2013, Signal Processing: Image Communication, QoMEX, ACM MM, IEEE Communication letters, IEEE Infocom, ICC, SVCVision/MOBIMEDIA, NTMS, MediaWin, PIMRC, among others.

I have been invited to participate in the following doctoral thesis committees:

1. Sabina Baraković. *"Multidimensional Modelling of Quality of Experience for Mobile Web Browsing"*. University of Zagreb, Croatia, October 2014 (I was an evaluator for this thesis)
2. Claudio Enrique Risso Montaldo. *"Using GRASP and GA to design resilient and cost-effective IP/MPLS networks"*. Universidad de la República, Uruguay, May 2014. (I was a rapporteur for this thesis)
3. Pablo Gabriel Romero Rodríguez. *"Mathematical Analysis of Scheduling Policies in Peer-to-Peer Video Streaming Networks"*. Universidad de la República, Uruguay, November 2012. (I was a rapporteur for this thesis)
4. Almudena Díaz Zayas. *"Performance Evaluation of IP Multimedia Services in Live Mobile Networks"*. Universidad de Málaga, Spain, December 2009.

I have also been invited to participate in the following Magister thesis committees:

1. Pablo Berger. *"Análisis de Calidad para Servicios de distribución de Video Adaptativo (HTTP Adaptive Streaming)"* Magister thesis in Informatics. Universidad de la República, Uruguay.
2. Gustavo Guimaerans. *"Performance Testing Applied to Critical Systems"*. Magister thesis in Informatics. Universidad de la República, Uruguay, May 2016.
3. Javier Pereira Lucas. *"Routing Cost Optimization in Multi Overlay Robust Networks"*. Magister thesis in Mathematical Engineering. Universidad de la República, Uruguay, May 2013.

Over the past few years, I have also acted as an evaluator for projects (both proposals and execution) for the NSERC (Natural Sciences and Engineering Research Council of Canada) and the Uruguayan ANII (National Agency for Research and Innovation).

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## LANGUAGES

Spanish – Mother tongue.

English – CEF C2 (CPE grade A – University of Cambridge)

French – Full working proficiency.

Finnish – CEF B2 (YKI intermediate level).

Portuguese – Can communicate.

Swedish – Basic notions.

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## PATENT APPLICATIONS

WO/2010/100315 Martín Varela, Marko Jurvansuu, Mikko Hanski, Jarmo Prokkola, and Matti Airas. "Perceived Quality Driven Multimedia QoS Optimization"

WO/2011/033173 Jouni Hiltunen, Jarmo Prokkola, Pekka Ruuska, and Martín Varela. "Method For Selecting Communications Network Utilizing Quality Of Service Measurements"

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## PUBLICATIONS

BOOK CHAPTERS



- [1] Martín Varela, Lea Skorin-Kapov, Katrien De Moor and Peter Reichl. "QoE – Defining a User-centric Concept for Service Quality". In *W. Chen, P. Chatzimisios, T. Dagikulas and L. Atzori (eds.) "Multimedia Quality of Experience (QoE): Current Status and Future Requirements"*, John Wiley & Sons, 2014.
- [2] Frédéric Guyard, Martín Varela, Lea Skorin-Kapov, Antonio Cuadra and Pedro Sevilla. "Quality of Experience Estimators in Networks". In *A. Mellouk and A. Cuadra (eds.) "Quality of Experience Engineering for Customer Added Value Services: From Evaluation to Monitoring"*, Iste / Wiley & Sons, 2014.
- [3] Antonio Cuadra, Mar Cutanda, Andreas Aurelius, Kjell Brunströmm, Jorge López de Vergara, Martín Varela, Jukka-Pekka Laulajainen, Anderson Morais, Ana Cavalli, Abdelhamid Mellouk, Brice Augustin and Ismael Pérez Mateos. "Ecosystem for Customer Experience Management". In *A. Mellouk and A. Cuadra (eds.) "Quality of Experience Engineering for Customer Added Value Services: From Evaluation to Monitoring"*, Iste / Wiley & Sons, 2014.
- [4] Martín Varela, Lea Skorin-Kapov and Touradj Ebrahimi. "Quality of Service vs. Quality of Experience". In *S. Möller and A. Raake (eds.) "Quality of Experience: Advanced Concepts, Applications and Methods"* – T-Labs Series in Telecommunications Services. Springer, 2014.

#### JOURNAL ARTICLES

- [5] Lea Skorin-Kapov, Martín Varela, Tobias Hoßfeld, Kuan-Ta Chen. "A Survey of Emerging Concepts and Challenges for QoE Management of Multimedia Services". Accepted for publication in ACM TOMM, 2018.
- [6] Peter Reichl, Patrick Zwickl, Patrick Maillé, and Martín Varela. "What You Pay is What You Get?". *Quality and User Experience* 3(5), Springer, 2018
- [7] Tobias Hoßfeld, Poul Einar Heegaard, Lea Skorin-Kapov and Martín Varela. "A New QoE Fairness Index for QoE Management". *Quality and User Experience* 3(4), Springer, 2018.
- [8] Tobias Hoßfeld, Poul Einar Heegaard, Lea Skorin-Kapov and Martín Varela. "Definition of QoE Fairness in Shared Systems". In *IEEE Communication Letters*, 21(1):184–187, January 2017.
- [9] Tobias Hoßfeld, Poul Einar Heegaard, Martín Varela and Sebastian Möller "QoE Beyond the MOS: An In-Depth Look at QoE via Better Metrics and their Relation to MOS". *Quality and User Experience* 1(1):1–23, Springer, 2016.

- [10] Katrien De Moor, Markus Fiedler, Peter Reichl and Martín Varela "Dagstuhl Manifesto: Quality of Experience: from Assessment to Application". *Informatik Spektrum*, 38(4), August 2015.
- [11] Martín Varela, Lea Skorin-Kapov, Frédéric Guyard and Markus Fiedler. "Meta-modeling QoE – Towards a Generic Methodology for Building QoE Models". *PIK - Praxis der Informationverarbeitung und -kommunikation*, 37(4):265-274, 2014.
- [12] Janne Seppänen, Martín Varela and Aggeliki Sgora. "An Autonomous QoE-Driven Network Management Framework". *Journal of Visual Communication and Image Representation* 25(3):565-577, April 2014
- [13] Tobias Hoßfeld, Raimund Schatz, Martín Varela and Christian Timmerer. "Challenges of QoE Management for Cloud Applications", *IEEE Communications Magazine* 50(4):28–36, April 2012.
- [14] Jochen Eisl, Matthias Lott, Gerhard Kuhn, Martín Varela, Jarmo Prokkola, Toni Mäki and Jukka-Pekka Laulajainen. "Analysis of Managed and Over-the-Top Streaming Services in Mobile Networks". *PIK - Praxis der Informationverarbeitung und -kommunikation* 35(3):1-7, 2012.
- [15] Ana Paula Couto da Silva, Martín Varela, Edmundo de Souza e Silva, Rosa Leão, and Gerardo Rubino. "Quality Assessment of Interactive Real Time Voice Applications". *Computer Networks* 52(6):1179–1192. April 2008.
- [16] Gerardo Rubino, Martín Varela and Jean-Marie Bonnin. "Controlling Multimedia QoS in the Future Home Network Using the PSQA Metric". *The Computer Journal* 49(2):137–155, 2006.
- [17] Samir Mohamed, Gerardo Rubino, and Martín Varela. "Performance Evaluation of Real-time Speech Through a Packet Network: a Random Neural Networks-based Approach". *Performance Evaluation*, 57(2):141-162, 2004.

#### INTERNATIONAL CONFERENCE AND WORKSHOP ARTICLES

- [18] Tobias Hoßfeld, Martín Varela, Poul E. Heegard and Lea Skorin-Kapov. "Some Observations on Emerging Aspects in QoE Modeling and Their Impact on QoE Management". Accepted for publication at QoE-Management 2018, Sardinia, Italy, May 2018.
- [19] Tobias Hoßfeld, Martín Varela, Poul E. Heegaard, and Lea Skorin-Kapov. "QoE Analysis of the Setup of Different Internet Services for FIFO Server Systems". In proceedings of MMB 2018, Erlangen, Germany, February 2018.
- [20] Tobias Hoßfeld, Poul E. Heegaard, Lea Skorin-Kapov and Martín Varela. "No Silver Bullet: QoE Metrics, QoE Fairness, and User Diversity in the Context of QoE Management". In proceedings of QoMEX 2017, Erfurt, Germany, May 2017.

- [21] Martín Varela and Toni Mäki. "Embracing Uncertainty: A Probabilistic View of HTTP Video Quality". In proceedings of IEEE/IFIP IM QoE-Management, Lisbon, Portugal, May 2017.
- [22] Tobias Hoßfeld, Lea Skorin-Kapov, Poul Einar Heegaard Martín Varela, and Kuan-Ta Chen "On Additive and Multiplicative QoS-QoE Models for Multiple QoS Parameters". In proceedings of PQS 2016, Berlin, Germany, August 2016.
- [23] Martín Varela, Hyunwoo Nam, Henning Schulzrinne and Toni Mäki. "Generating Realistic YouTube-like Stall Patterns for HTTP Video Streaming Assessment". In proceedings of QoMEX 2016, Lisbon, Portugal, June 2016.
- [24] Toni Mäki, Patrick Zwickl and Martín Varela. "Network Quality Differentiation: Regional Effects, Market Entrance, and Empirical Testability". In proceedings of IFIP Networking 2016, Vienna, May 2016.
- [25] Toni Mäki, Martín Varela and Doreid Ammar. "A Layered Model for Quality Estimation of HTTP Video from QoS Measurements". In proceedings of SITIS / QUAMUS 2015, Bangkok, Thailand, November 2015.
- [26] Pedro Casas, Martín Varela, Pierdomenico Fiadino, Mirko Schiavone, Helena Rivas and Raimund Schatz. "On the Analysis of QoE in Cellular Networks: from Subjective Tests to Large-scale Traffic Measurements". In proceedings of IWCMC'15 / TRAC, Dubrovnik, Croatia, August 2015.
- [27] Doreid Ammar and Martín Varela. "QoE-Driven Admission Control for Video Streams". In proceedings of IISA 2015, Corfu, Greece, July 2015.
- [28] Doreid Ammar and Martín Varela. "QoE-Aware Routing for Video Streaming". In proceedings of IEEE/ACM IWQoS, Portland, USA, June 2015.
- [29] Martín Varela, Patrick Zwickl, Peter Reichl, Min Xie and Henning Schulzrinne. "From Service Level Agreements (SLA) to Experience Level Agreements (ELA): The Challenges of Selling QoE to the User". In proceedings of IEEE ICC QoE-FI, London, June 2015.
- [30] Tobias Hoßfeld, Poul Einar Heegaard and Martín Varela. "QoE beyond the MOS: Added Value Using Quantiles and Distributions". In proceedings of QoMEX 2015, Costa Navarino, Greece, May 2015.
- [31] Martín Varela, Toni Mäki, Lea Skorin-Kapov and Tobias Hoßfeld. "QoE in the Web: A Dance of Design and Performance". In proceedings of QoMEX 2015, Costa Navarino, Greece, May 2015.
- [32] Esa Piri, Martín Varela and Jarmo Prokkola "A Network Information Service for Quality-Driven Mobility". In proceedings of CCNC 2015, Las Vegas, USA, January 2015.

- [33] Martín Varela, Toni Mäki, Juho Merilahti, Eva Rodríguez and Arnaud Runge "QuoTe - An Extensible Platform for QoE Monitoring and Benchmarking of Telemedicine Applications". In proceedings of SSH 2014: IEEE International Workshop on Service Science for eHealth, Natal, Brazil, October 2014.
- [34] Pantelis Frangoudis, Aggeliki Sgora, Martín Varela and Gerardo Rubino "Quality-Driven Optimal SLA Selection for Enterprise Cloud Communications". In proceedings of IEEE QoENAM 2014, Sydney, Australia, June 2014.
- [35] Katrien De Moor, Filippo Mazza, Isabelle Hupont, Miquel Ríos Quintero, Toni Mäki and Martín Varela "Chamber QoE - A Multi-instrumental Approach to Explore Affective Aspects in relation to Quality of Experience". In proceedings of SPIE/HVEI 2014, San Francisco, U.S.A, January 2014.
- [36] Martín Varela, Toni Mäki, Lea Skorin-Kapov and Tobias Hoßfeld. "Increasing Payments in Crowdsourcing: Don't Look a Gift Horse in the Mouth!". In proceedings of PQS 2013, Vienna, Austria, September 2013.
- [37] Martín Varela, Toni Mäki, Lea Skorin-Kapov and Tobias Hoßfeld. "Towards an Understanding of Visual Appeal in Website Design". In proceedings of QoMEX 2013, Klagenfurt, Austria, July 2013.
- [38] Toni Mäki, Dragan Kukulj, Dragana Đorđević and Martín Varela. "A Reduced-Reference Parametric Model for Audiovisual Quality of IPTV Services". In proceedings of QoMEX 2013, Klagenfurt, Austria, July 2013.
- [39] Toni Mäki, Martín Varela and Jukka-Pekka Laulajainen. "Estimating the Effect of Context on QoE of Audiovisual Services: Laboratory vs. Public Places". In proceedings of IWQM/SaCoNet 2013, Paris, France, June 2013.
- [40] Antonio Cuadra, Mar Cutanda, Andreas Aurelius, Kjell Brunströmm, Jorge Lopez de Vergara, Martín Varela, Jukka-Pekka Laulajainen, Anderson Morais, Ana Cavalli, Ismael Perez-Mateos. "Ecosystem for Customer Experience Assurance". In proceedings of IWQM/SaCoNet 2013, Paris, France, June 2013.
- [41] Janne Seppänen and Martín Varela. "QoE-Driven Network Management for Real-Time Over-the-Top Multimedia Services". In proceedings of *IEEE WCNC 2013*, April 2013, Shanghai, China.
- [42] Lea Skorin-Kapov and Martín Varela. "A Multi-Dimensional View of QoE: the ARCU Mode". In proceedings of *MIPRO 2012*, May 2012, Opatija, Croatia.
- [43] Antonio Cuadra-Sánchez, Mar Cutanda-Rodríguez, Ismael Pérez-Mateos, Andreas Aurelius, Kjell Brunströmm, Jukka-Pekka Laulajainen, Martín Varela and Jorge López de

- Vergara. "A Global Customer Experience Management Architecture". In proceedings of *Future Network and Mobile Summit*, July 2012, Berlin, Germany.
- [44] Martín Varela and Jukka-Pekka Laulajainen. "QoE-Driven Mobility Management - Integrating the Users' Quality Perception into Network-level Decision Making". In proceedings of QoMEX, September 2011, Mechelen, Belgium.
- [45] Martín Varela and Jukka-Pekka Laulajainen. "Terminal-side QoE Estimations for Cross-Layer Network Control" (invited paper). In proceedings of *WWIC'11*, June 2011, Villanova i la Geltrú, Spain.
- [46] Sebastián Basterrech, Gerardo Rubino and Martín Varela. "Single-Sided Real-Time PESQ Score Estimation". In proceedings of *MESAQIN'09*, June 2009, Prague, Czech Republic.
- [47] Pekka Perälä and Martín Varela. "Some Experiences with VoIP Over Converging Networks". In proceedings of *MESAQIN'07*, June 2007, Prague, Czech Republic.
- [48] Yezekael Hayel, Gerardo Rubino, Bruno Tuffin and Martín Varela. "A New Way of Thinking Utility in Pricing Mechanisms: A Neural Network Approach". In *Proceedings of CLAIO 2006*, November 2006, Montevideo, Uruguay.
- [49] Gerardo Rubino, Pierre Tirilly and Martín Varela. "Evaluating Users' Satisfaction in Packet Networks Using Random Neural Networks". In proceedings of *ICANN'06*, September 2006, Athens, Greece .
- [50] Martín Varela, Ian Marsh and Björn Grönvall. "A Systematic Study of PESQ's Performance (from a Networking Perspective)" In *Proceedings of Proceedings of the Measurement of Speech and Audio Quality in Networks Workshop (MESAQIN'06)*, Prague, Czech Republic, June 2006.
- [51] Gerardo Rubino, Martín Varela and Jean-Marie Bonnin. "Wireless VoIP at Home: Are We There Yet?" In *Proceedings of Proceedings of the Measurement of Speech and Audio Quality in Networks Workshop (MESAQIN'05)*, Prague, Czech Republic, June 2005.
- [52] Martín Varela. "Studying the Effects of FEC on Voice Traffic Using PSQA (extended abstract)". In *INFOCOM'05 Student Workshop*, Miami, USA, March 2005.
- [53] Gerardo Rubino and Martín Varela. "Evaluating the Utility of Media-dependent FEC in VoIP Flows". In *LNCS 3266: Proceedings of the Fifth International Workshop on Quality of future Internet Services (QofIS'04)*, Barcelona, Spain, September 2004.
- [54] Gerardo Rubino and Martín Varela. "A New Approach for the Prediction of End-to-End Performance of Multimedia Streams". In *Proceedings of the First International Conference on Quantitative Evaluation of Systems (QEST'04)*, Enschede, The Netherlands, September 2004.

- [55] Catherine Colomes, Martín Varela, and Jean-Charles Gicquel. "Subjective Audio Tests: Quality of Some Codecs When Used in IP Networks". In *Proceedings of the Measurement of Speech and Audio Quality in Networks Workshop (MESAQIN'04)*, Prague, Czech Republic, June 2004.
- [56] Samir Mohamed, Gerardo Rubino, and Martín Varela. "A Method for Quantitative Evaluation of Audio Quality Over Packet Networks and its Comparison with Existing Techniques". In *Proceedings of the Measurement of Speech and Audio Quality in Networks Workshop (MESAQIN'04)*, Prague, Czech Republic, June 2004.
- [57] Daniel Perovich, Leonardo Rodríguez and Martín Varela. "Historias Clínicas en Tarjetas Inteligentes". In *Proceedings of the 30th Jornadas Argentinas De Informática e Investigación Operativa (JAIIO)*, Buenos Aires, Argentina, September 2001.
- [58] Daniel Perovich, Leonardo Rodríguez and Martín Varela. "A Simple Methodology for Secure Object Sharing". In *Proceedings of the 3rd Gemplus Developers Conference*, Paris, France, June 2001.

#### NATIONAL CONFERENCE AND WORKSHOP ARTICLES

- [59] Martín Varela, Ian Marsh, Björn Grönvall and Florian Hammer. "A Metric for Single-ended Speech Quality Estimation" In proceedings of *4th Swedish National Computer Networking Workshop SNCNW 2006*, October 2006, Luleå, Sweden.
- [60] Martín Varela. "Évaluation Pseudo-subjective de la Qualité des Flux VoIP: un Approche par Réseaux de Neurones Aléatoires". In *Proceedings of JDIR'04*, Lannion, France, November 2004.

#### OTHER PUBLICATIONS

- [61] ETSI TS 103 294. "Quality of Experience: A Monitoring Architecture". December 2014.
- [62] Martín Varela and Janne Seppänen. "Video Quality as a Driver for Traffic Management with Multiple Subscriber Classes". *IEEE Communications Society MMTC E-Letter*, Vol.8, No.2, March 2013.
- [63] Patrick Le Callet, Sebastian Möller and Andrew Perkis (eds). "Qualinet White Paper on Definitions of Quality of Experience". European Network on Quality of Experience in Multimedia Systems and Services (COST Action IC 1003), June 2012.
- [64] Martín Varela. "Some Musings on QoE Definitions - Philosophy and Practice". January 2012.
- [65] Martín Varela. "Gilbert-model Loss Trace Generator for Instrumentation of Subjective Assessment Campaigns". January 2012.

- [66] Martín Varela and Jouko Sankala. "Understanding Quality Issues in the Cloud". White paper for the TIVIT Cloud Software Program. November 2010.
- [67] Martín Varela "Pseudo-subjective Quality Assessment of Multimedia Streams and its Applications in Control", Ph.D. Dissertation, Université de Rennes 1, November 2005.
- [68] Martín Varela "Mesure de la Qualité d'un Flux Multimédia Transporté sur Internet", Master Thesis, Université de Rennes 1 July 2002.
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## SEMINARS AND TALKS

1. "QoE Management – Out of the Lab and Into the Real World", Lecture at QoE-NET Summer School, Plymouth, UK, September 2016.
2. "The Road to QoE Management". Keynote speech at IEEE ICC QoE-FI 2016. Kuala Lumpur, Malaysia, May 2016.
3. "Quality of Experience in OTT Video Services". Celtic-Plus NOTTS Final Seminar, Vaasa, Finland, May 2016.
4. "Quality of Experience – Basic Concepts and Advanced Applications". Invited talk, InCo, Fing, Universidad de la República, Uruguay, December 2015
5. "Towards an Open Architecture for QoE Management". ETSI STQ Workshop, Vienna, October 2015.
6. "QoE for Cloud Services". Invited talk at ITC27/ACROSS Workshop, Ghent, Belgium, September 2015.
7. "QoE: from Measurements to Business". Keynote speech for IWCMC/TRAC 2015, Dubrovnik, Croatia, August 2015.
8. "QoE-driven Management: from Modelling to Operation". Tutorial at EU CROSSFIRE doctoral workshop, Newbury, UK, February 2015.
9. "Quality of Experience: From Assessment to Application". [Dagsuthi Seminar 15022](#), held on Jan 4th–7th 2015. Organized jointly with Dr. Katrien De Moor (NTNU), Prof. Markus Fiedler (BTH), and Prof. Peter Reichl (U. Vienna).
10. "QoE – Why bother?". Invited talks at the University of Klagenfurt and University of Vienna, Austria, October 2014.
11. "Quality-driven Network and Application Control". Invited talk at the University of Oulu, Oulu, Finland, May 2014.

12. *"First Steps Towards an Understanding of Web QoE"*. QUALINET Online Training School. July 2013.
13. *"QoE: Beyond QoS, and Beyond Media"*. Invited talk at IEEE Eurocon 2013. Zagreb, Croatia, July 2013.
14. *"Users: A Key Missing Piece in the QoE Puzzle"*. Opening talk for the "Building Bridges Between QoE and Affective Computing" workshop. Oulu, Finland, May 2013.
15. Workshop *"Building Bridges Between QoE and Affective Computing"*. Oulu, Finland. May 2013. Organized in cooperation with Dr. Katrien De Moor (NTNU) and Dr. Isabelle Hupont (ITA).
16. *"Current Trends on QoE Research and Some Application Results"*. Invited talk at the Computer Science Institute (InCo), Universidad de la República, Uruguay, November 2012.
17. *"Applications of Perceptual Quality Estimation to Cross-Layer Optimization Techniques"*. QUALINET Online Training School. July 2012.
18. *"QoE y Cloud: Problemas Técnicos y Perspectivas de Negocio"*. Invited talk at the TEC-SMEDIA 2012 Congress. Zaragoza, Spain, June 2012.
19. *"Quality in the Cloud – Business and Technical Challenges"*. Invited talk at the SISCom Bretagne "Towards Future Telecommunication Ecosystems" seminar. Rennes, France. September 2011.
20. *"Calidad de Experiencia para Servicios Multimedia"*. Invited talk for M.Sc. course in Universidad de Málaga. Málaga, Spain, December 2009.
21. *"Real-Time Assessment of Multimedia Quality"*. Invited talk at the EuroNGI Industrial Club Meeting. Rennes, France. April 2008.
22. *"Seminar on Quality of Networked Multimedia Applications"* (organizer and presenter). VTT, Oulu, Finland. December 2006.
23. *"Réseaux de Neurones pour l'Estimation de la Qualité d'un Flux Audio ou Vidéo, Applications au Contrôle et à la Tarification"* – Invited talk, Action Spécifique STIC CNRS "Métrologie des réseaux de l'Internet", LIP6, Paris, France, May 2003.
24. *"Évaluation Pseudo-Subjective de la Qualité de la Voix sur IP"* – 24<sup>ème</sup> Rencontre Irisatech ("IP Telephony"), Rennes, France, April 2003.
25. *"The Utility Function and Random Neural Networks"* – Workshop de l'ARC PRINXNET, Rennes, France, March 2003.
26. *"Mesure de la Qualité d'un Flux Multimédia Transporté sur un Réseau de Paquets: Neurones, Mesures Subjectives, et d'autres Aspects"* – Team seminar on network pricing, Rennes, France, October 2002.



27. "Evaluación Pseudo-Subjetiva de un Flujo Multimedia Transportado sobre una Red de Paquetes" – Operations Research Department seminar, Universidad de la República, Montevideo, Uruguay, August 2002.

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## PERSONAL

I am married and have two small children (boys, 5 and 3 years old). I enjoy a variety of activities outside of work, which nowadays include photography<sup>1</sup>, calligraphy, cooking, reading, diving, and badminton. In younger (and lighter!) years I was an avid rock climber. In each of those activities, part of the enjoyment comes from developing my abilities and knowledge, and the same frame of mind applies to my work; a significant part of what makes me tick is learning and understanding new things, and seeing how they can be brought together in interesting ways.

I also enjoy tinkering with technology, and have for instance dabbled with Arduino, built my own quad-copter, a mechanical keyboard from an old typewriter, etc.

<sup>1</sup>[https://www.flickr.com/photos/mvr\\_photo/](https://www.flickr.com/photos/mvr_photo/)