

## CURRICULUM VITAE

### Personal Data

Age: 46  
Date of birth: May 14, 1967  
Place of birth: Pappenheim (Germany)  
Nationality: German  
Civil Status: Married with Mag. Marena Balinova-Reichl



### Degrees

- 2010 **Habilitation** (Priv.-Doz.) degree, Department of Electrical Engineering and Information Technology, Technical University of Graz (TUG), Austria.  
Thesis: *Telecommunication Economics for Next Generation Networks*.
- 1999 **Ph.D.** (Dr. rer. nat.) degree in Computer Science, RWTH Aachen, Germany.  
Thesis: *Dynamic Traffic and Tariff Modelling for Communication Networks*.
- 1994 **Diploma** (Dipl.-Math. Univ.) degree in Mathematics, Munich University of Technology (TUM), Germany. Thesis: *A General Lower Bound for the Loss Rate in Non-Symmetric Networks*.
- 1992 **Master** of Advanced Studies (MASt) degree, University of Cambridge, UK.
- 1991 **Bakkalaureat** in Philosophy, Munich School of Philosophy (Hochschule für Philosophie S.J.), Munich, Germany.

### Formal Education

- 1995-1999 Ph.D. studies in Computer Science at RWTH Aachen and ETH Zurich.
- 1987-1994 Studies in Mathematics at Munich University of Technology (TUM), six-year scholarship due to the Bavarian Elite Students Promotion Act (Bayerisches Begabtenförderungsgesetz). Vordiplom 1989, Diplom 1994.
- 1991-1992 Part III of the Mathematical Tripos at University of Cambridge (UK).
- 1989-1993 Studies in Philosophy at Hochschule für Philosophie S.J. and Ludwig-Maximilians-Universität Munich. Zwischenprüfung 1991.
- 1988-1991 Studies in Physics at TU Munich. Vordiplom 1990.
- 1973-1986 Grundschule and Gymnasium Weissenburg (Bavaria). Abitur 1986.

## Professional Experience

- since 2013    **Full Professor of Computer Science (Cooperative Systems)**, Department of Computer Science, *University of Vienna, Austria*
- Head of Research Group Cooperative Systems (<http://cosy.cs.univie.ac.at>)
  - Participation in national and European research projects (total funding sum acquired since 2013: 0.53 M€)
  - Supervisor of 4 currently running PhD theses
- 2012-2014    **RBUCE WEST International Research Chair** “Network-based Information and Communication Ecosystems (NICE)”, *Université européenne de Bretagne (UEB) and Institut Mines – Télécom/Télécom Bretagne, Rennes, France*
- 2011-2012    **Professor for Networking Technology (especially Human-Centred Communications)**, Department of Communications and Networking (COMNET), School of Electrical Engineering, *Aalto University (TKK) Helsinki, Finland*
- 2010-2011    **SISCom International Research Chair** for “Future Telecommunication Ecosystems”, *UEB/INRIA Rennes – Bretagne Atlantique, France*
- 2001-2013    **FTW Telecommunications Research Center Vienna, Austria**  
(<http://userver.ftw.at/~reichl>)
- 2001–2004    **Senior Researcher** “Networks & Services”, **Project Manager**
- 2004–2013    **Key Researcher** “Economic & User Aspects”, **Project Manager**
- 2008–2011    also **Area Manager** of Research Area U “User-Centred Interaction and Communication Economics”
- Research on Network Economics, Next Generation Networks (IMS) and service platforms for 3G and beyond, Quality-of-Service and Quality-of-Experience in Internet and mobile networks, network management, usability and HCI, future telecommunication services
  - Project acquisition and management for application-oriented and strategic projects in the area of wireless networks, 3G and beyond networks, and user/economic aspects of telecommunication services (total acquisition sum 2002-2012: approx. 8.3 M€)
  - HR responsibility for around 15 staff members. Supervisor/co-supervisor of 6 completed PhD theses and more than 20 Diploma/Master theses.
  - Author or co-author of more than 100 peer-reviewed journal and conference papers, invited papers and book chapters
  - Participation in international projects e.g. FP7 ETICS, CELTIC AWARE and QuEEN, IST-MobyDick, IST-M3I and E-NEXT. Austrian delegate + **STSM coordinator** COST Action IC1003; Austrian delegate + **WG4 chair** COST Action IS0605 “Econ@Tel”
  - **Co-chair** of six international workshops on “Internet Charging and QoS Technology” (ICQT, 2001-2009). Organization of Dagstuhl Seminars on Internet Economics (2003, 2006) and Quality-of-Experience (2009, 2012).

- 2006-2011 **Distinguished Guest Lecturer** at *Technical University Graz*, for “Fundamentals of Telecommunication Economics”.
  - 2007-2011 **Lecturer** at University of Applied Sciences *Technikum Vienna*, for “Advanced System Architectures”, “Application Prototyping”, “Internet Economics”.
  - Sabbaticals/research stays 2008 and 2009 as **Visiting Professor** at *INRIA Rennes*, 2010 as **Invited Professor** at *Télécom Bretagne Rennes*, and 2011-2013 as **Invited Professor** at *LAAS-CNRS Toulouse*, France.
- 1998-2001 **Permanent Visiting Scientist**, Computer Engineering and Networks Laboratory (TIK), *Eidgenössisch-Technische Hochschule (ETH), Zurich, Switzerland*
- Ph.D. research on Tariff Models for Internet Services
  - Participation in national (CATI, ANAISOF) and European IST projects (M3I), with own research on Internet charging and accounting
  - Lecture assistance, supervision of diploma and seminar theses
- 09-11/1998 **Visiting Scientist**, *Bell Labs (Lucent Technologies), Murray Hill, NJ, USA*
- Research on Quality-of-Service and Service Level Agreements
- 1996-1997 **Guest Lecturer**, *Universität-GH Essen, Germany*.
- Winter term 1996/97: „Verteilte Systeme“ (Distributed Systems)
  - Winter term 1996/97: „Netzmanagement“ (Network Management)
- 1995-1998 **Scientific Assistant**, Communications Systems Laboratory, *Aachen University of Technology (RWTH), Germany*.
- Ph.D. research on several topics in the areas of Internet Traffic Modeling, Distributed Systems, Security, Modeling and Performance Evaluation of Computer Networks
  - Lecture assistance and students exercises supervision for lectures “Operating Systems”, “Local Area Networks”, “Network Management”, “Distributed Systems”, “Performance Evaluation of Computer Networks”
  - Supervision of diploma and seminar theses in the area of traffic modeling for Internet and GSM networks
  - Project collaboration with Ericsson Eurolab Herzogenrath on traffic modeling for GSM networks
- 02-08/1995 **Insurance Mathematician**, *Vereinte Versicherungen, Munich, Germany*.
- Calculation and controlling of health insurance tariffs
- 1992 + 1993 **Invited Researcher**, *Statistical Laboratory, University of Cambridge, UK*
- Implementation and simulation of stochastic network scenarios
  - Research on stochastic modelling of telecommunication networks

# Project Experience (Research, Management, Acquisition)

## Awards and Distinctions

2011 **Alcatel-Lucent Bell Labs Teamwork Award** for “Congestion-driven Wi-Fi Offload Prototype for BT and Telekom Austria” (Project AWARE) with the mention “Recognized for Demonstrating Extraordinary Performance and Role Model Teamwork”.

## Acquisition and Management of Research Projects

### 1. AWARE@FTW: Aggregation of Wireless Access Resources

|                               |   |
|-------------------------------|---|
| <i>Function:</i>              | Project Manager   |
| <i>Project type:</i>          | Application-oriented COMET (K1) project at the Telecommunications Research Center Vienna (FTW) within CELTIC                        |
| <i>Project partners:</i>      | Mobilkom Austria, Alcatel-Lucent Austria, Alcatel-Lucent Bell Labs France, Université de Versailles St.-Quentin-en-Yvelines, France |
| <i>Project duration:</i>      | 01/2010 – 03/2013   |
| <i>Budget responsibility:</i> | 1 130 000 €   |

*Summary:* The COMET project AWARE@FTW is the Austrian stand-alone contribution to the European CELTIC-AWARE project whose key idea is to investigate the aggregation of different wireless access resources and to allow telecommunication service actors to exploit the resulting new network infrastructure.

Within the general trend towards convergent future communication networks, customers expect to have access to broadband mobile services at low cost and in an intuitive way, whereas deploying new radio systems may be expensive and hard to manage, especially in urban environments. As an alternative, CELTIC-AWARE focuses on providing high bandwidth mobile networks in urban areas leveraging on aggregated wireless access resources, making industry and telecommunication actors ready to deploy their services on top of this aggregation. To achieve this, CELTIC-AWARE will follow three axes of development, i.e. (1) providing a shared infrastructure for reliable seamless mobility including the inter-working with legacy systems, (2) considering different operational modalities, including concepts for new charging and billing mechanisms as well as security and management, and (3) analyzing the economic models and opportunities, as well as assessing the social acceptance and legal aspects of the targeted solution. In this way, CELTIC-AWARE aims at demonstrating technical capabilities and economic opportunities of the proposed network infrastructure.

In this framework, the COMET project AWARE@FTW will strongly focus on specific interests of the Austrian project partners Mobilkom Austria and Alcatel-Lucent Austria. AWARE@FTW focuses especially on economic aspects and business models for future converging networks, network neutrality aspects and regulatory issues, device-level convergence, access point auto-configuration mechanisms, customer-operator access point (co-)management, handover management and legacy inter-working, resilient network architectures and protocols, trustable distributed resource usage monitoring, and security and privacy issues.

*Own research contributions:*

- Economics and business models for WLAN aggregation and Femto technologies
- User acceptance and Quality-of-Experience (QoE)

*Project homepage:* <http://www.ftw.at/forschung-innovation/projekte/aware>

## **2. BACCARDI: Beyond Architectural Convergence – Charging, SeCurity, Applications, Realization and Demonstration of IMS over fixed and wireless networks**

*Function:* Project Manager

*Project type:* Application-oriented COMET (K1) project at the Telecommunications Research Center Vienna (FTW)

*Project partners:* Mobilkom Austria, Telekom Austria, Kapsch CarrierCom, Alcatel Austria, TU Vienna (IBK, INTHFT)

*Project duration:* 03/2008 – 12/2009

*Budget responsibility:* 1 793 000 €

*Summary:* BACCARDI is the most recent one in a series of NGN-related projects at ftw. including N3-CAMPARI, P4-SIMS and N9-CAIPIRINA. Based on the rich experience and infrastructure created by these predecessor projects, BACCARDI will focus on a broad range of IMS integration aspects which include migration issues, identity management, and overload situation handling from an architectural point of view. Factors which BACCARDI considers to be decisive for NGN acceptance include the definition of novel integrated services and enablers, as well as analysis and provisioning of appropriate security mechanisms as countermeasures to NGN attacks with dedicated focus on Spam over Internet Telephony (SPIT), which is commonly agreed on to be a high risk for NGN success. With increasing number of customers migrating to NGN, service differentiation by means of quality of service will be of paramount importance for positive user experience, same like flexible charging offerings. Finally, integration aspects govern also the planned BACCARDI testbed evolution towards interoperability and interconnect. A cornerstone of testbed extension will be the integration of existing third-party components for MGCF, MGW and SBC, complemented by feasibility studies and optional development of prototypes for components like RACS and NASS.

*Own research contributions:*

- Charging and billing in IMS: charging architecture, tariffing, evaluation
- Quality-of-User Experience (QoX) for voice and video

*Project homepage:* <http://ngnlab.ftw.at>

## **3. U0-IVY: User-Centered Interaction and Visualization**

*Function:* Project Manager (until February 2011) and Key Researcher

*Project type:* Strategic COMET (K1) project at the Telecommunications Research Center Vienna (FTW)

*Project partners:* all FTW partner companies

*Project duration:* 01/2008 – 12/2011

*Budget responsibility:* 1 312 000 €

*Summary:* Continuing and extending the successful strategic projects U0-SUPRA and U0-SUPRA++ (see below), U0-IVY is the strategic project of the K1 Center's Research Area U "User-Centered Interaction and Visualization". The project focuses on designing multimodal interfaces and investigating novel interaction modes that connect the infotopo to the human senses as naturally as possible. Specific project goals include

- to anticipate upcoming opportunities and potential design of future ubiquitous systems and the reactions of human users confronted with them;
- to transform current machine-centric processes into more intuitive approaches following the path of human reasoning and problem solving, in order to reduce digital divide and increase the accessibility of information systems;
- to develop, implement, and test non-classical interface techniques, especially in the field of virtual reality, thus providing a testbed for usability studies and interface evaluations;
- to assess the user experience of concrete applications, and understand human usage in a broader scale, in order to empirically ground and shape future innovations;
- to develop and boost research-oriented collaboration between groups of industrial ICT stakeholders and related academic disciplines like sociology, psychology, economy, law, communication sciences and many more.

IVY conducts theoretical as well as experimental research. Part of the research program deals with methodological advances on user-centric application design and evaluation methods, new modes of user interaction and user behaviour, ICT-related innovation processes and sustainable business models. The experimental work is concentrating on the Interfaces and Interactions Lab (iLab) whose main features include advanced in- and out-door equipment for highly specialized user tests in realistic environments ranging from mobile contexts to the connected home, facilities for rapid prototyping and experimental virtual environments as well as testbeds for perceptual quality evaluation.

*Own research contributions:*

- Socio-economic issues in telecommunications
- Interaction design for future mobile applications
- Quality-of-Service (QoS) vs. Quality-of-Experience (QoX)

*Project homepage:* <http://ilab.ftw.at>

#### **4. N9-CAIPIRINA: Converging towards All-IP: IMS Realization Issues for NGN Applications**

*Function:* Project Manager

*Project type:* Application-oriented *Kplus* project at the Telecommunications Research Center Vienna (FTW)

*Project partners:* Mobilkom Austria, Kapsch CarrierCom, Alcatel Austria, TU Vienna (IBK, INTHT)

*Project duration:* 10/2006 – 02/2008

*Budget responsibility:* 635 000 €

*Summary:* The 3GPP IP Multimedia Subsystem (IMS) is currently expected to provide the basic architecture framework for the Next Generation Network (NGN) which will bridge the traditional divide between circuit-switched and packet-switched networks and consolidate both sides into one single network for all services. Therefore, the imminent commercial roll-out of IMS will have immense impact both for the migration of the core network as well as the integration of future mobile services and applications and will provide a significant step towards an All-IP network architecture for NGN applica-

tions. As an immediate and direct follow-up of the FTW projects N3-CAMPARI (see below) and P4-SIMS, and based on the rich expertise and the practical results (testbed, evaluation tools, etc.) gained during these very successful projects, the new application-oriented project N9-CAIPIRINA will focus on various aspects arising while the IMS is realized and introduced into existing mobile network infrastructures. Based on the existing “IMS in a bottle” testbed, detailed performance measurements allow to collect experiences in tuning IMS core networks. Another strong focus of the project is on exploring the rich opportunities related to the IMS charging architecture. Quality-of-Service issues to be investigated include resilience in the core as well as perceived QoS and charging for it. Last but not least, we also concentrate on Application Server Architectures.

*Own research contributions:*

- Charging in IMS: architecture, tariff models, implementation, evaluation
- Quality-of-Service (QoS) and Quality-of-User Experience (QoE)

*Project homepage:* <http://ims.ftw.at>

## 5. U0-SUPRA++: Strategic Usability and Pricing Research Activity (Phase 2)

*Function:* Project Manager and Key Researcher

*Project type:* Strategic *Kplus* project at the Telecommunications Research Center Vienna (FTW)

*Project partners:* all FTW partner companies

*Project duration:* 07/2006 – 12/2007

*Budget responsibility:* 411 000 €

*Summary:* As a direct one-year continuation of the successful strategic project U0-SUPRA (see below), the project SUPRA++ focuses on interdisciplinary research issues between technology, economy and Human-Computer Interaction. Leveraging upon technological competence as the primary strength of ftw.. SUPRA++ aims at enriching this perspective on telecommunications by selected user-centric and economic elements. The technical workpackages deal with fundamental HCI methodologies, personal content and multimedia technology, economics and pricing, and user-perceived Quality-of-Service. Together with the state-of-the-art lab environment, which is especially tailored towards user trials for mobile telecommunications applications (e.g. through the flexible LiLiPUT system), this expertise allows the project to support both internal and external projects and partners and maintain close cooperations with related internal, national and European activities. Therefore, SUPRA++ continues the SUPRA tradition in supplementing the strategic research portfolio at ftw. with an essential building block that is especially vital for the further economic success of the partner companies.

*Own research contributions:*

- Internet Economics: economic methods and models for packet-based communication systems
- New paradigms for interaction design in mobile telecommunications
- Efficient charging and billing mechanisms for Next Generation Networks and Services (focus on IMS off-line and on-line charging)

*Project homepage:* <http://www.ftw.at/ftw/research/projects/ProjekteFolder/U0>

## 6. N3-CAMPARI: Configuration, Architecture, Migration, Performance Analysis and Requirements of 3G IMS

*Function:* Project Manager  
*Project type:* Application-oriented *Kplus* project at the Telecommunications Research Center Vienna (FTW)  
*Project partners:* Mobilkom Austria, Kapsch CarrierCom, Alcatel Austria, TU Vienna (IBK, INTHTF)  
*Project duration:* 10/2004 – 06/2006  
*Budget responsibility:* 746 000 €

*Summary:* The application-oriented project CAMPARI aims at investigating a “minimal-optimal” 3G IMS (IP Multimedia Subsystem) configuration with respect to architecture and Quality-of-Service aspects. The corresponding performance evaluations include measurements with a dedicated IMS prototype emulation as well as dimensioning of the UMTS network based on simulations with a dedicated IMS Traffic Generator (ITG). Further CAMPARI research deals with billing, migration, interworking and user-perceived quality, eventually aiming at a pragmatic strategy framework for the successful introduction of IMS into current mobile networks.

*Own research contributions:*

- Billing models and systems for IMS services
- Interfaces towards higher layer services

*Project homepage:* <http://www.ftw.at/ftw/research/projects/ProjekteFolder/N3>

## 7. U0-SUPRA: Strategic Usability and Pricing Research Activity (Phase 1)

*Function:* Project Manager and Key Researcher  
*Project type:* Strategic *Kplus* project at the Telecommunications Research Center Vienna (FTW)  
*Project partners:* all FTW partner companies  
*Project duration:* 07/2003 – 06/2006  
*Budget responsibility:* 958 000 €

*Summary:* The strategic project SUPRA investigates user-related aspects of telecommunications. Within this field, the project deals with issues concerning the growing importance of both mobile services and IP. Thus, we focus on usability design and evaluation for future mobile services, multi-modal user interfaces for speech recognition and information retrieval, and user perception and pricing of service quality. Closely embedded within the context of related internal, national and international projects and activities, SUPRA aims at supplementing the strategic research portfolio at ftw. with an essential new building block that is vital also for the further economic success of the partner companies.

*Own research contributions:*

- Technically feasible and efficient billing and pricing of Internet and mobile services (e.g. Cumulus Pricing, second-chance auctions, congestion pricing)
- Perceptual quality of VoIP services (influence of packet loss, standardization of conversational interactivity, user tests)



- Internet Economics: modeling communication networks from an economic perspective

*Project homepage:* <http://www.ftw.at/ftw/research/projects/ProjekteFolder/U0>

## 8. **A3-WISQY: Wireless InterSystem Quality-of-Service**

*Function:* Project Manager and Senior Researcher

*Project type:* Application-oriented *Kplus* project at the Telecommunications Research Center Vienna (FTW)

*Project partners:* Mobilkom Austria, Kapsch CarrierCom, Institut für Breitbandkommunikation (IBK, TU Vienna)

*Project duration:* 10/2002 – 09/2004

*Budget responsibility:* 538 000 €

*Summary:* A3-WISQY is an application-oriented project on end-to-end Quality-of-Service (QoS) in mobile environments. The project focuses on the behaviour of QoS parameters at network edges, especially between differing wireless access technologies like UMTS (W-CDMA) and IEEE 802.11a/g WLAN. It is investigated how QoS parameters can be mapped upon each other. Moreover protocol parameter tuning is optimized using a test system especially set up for the purposes of the project. In collaboration with the EU IST-project “MobyDick – Mobility and Differentiated Services in a Future IP Network”, we deal with further important aspects of QoS provision over network boundaries, especially regarding protocol, security and selected AAAC (authentication, authorisation, accounting, auditing, charging) aspects. Finally, also migration aspects from Mobile IP to Mobile IPv6 as well as wireless ISP setup issues are considered.

*Own research contributions:*

- Models and simulation for TCP over wireless
- AAA requirements in wireless networks

*Project homepage:* <http://www.ftw.at/ftw/research/projects/ProjekteFolder/A3>

## Participation in National and International Research Projects

### 9. PRECIOUS: PREventive Care Infrastructure based On Ubiquitous Sensing

|                          |  |
|--------------------------|--|
| <i>Function:</i>         | Technical and administrative coordinator UNIVIE, leader WP6  |
| <i>Project type:</i>     | EU FP7 STREP (grant agreement no. 611366)  |
| <i>Project partners:</i> | Aalto University, University of Helsinki, Firstbeat Technologies, Institut Mines-Télécom, Campden BRI, Universität Wien, Fundacio Hospital Universitari Vall d'Hebron, EuroFIR |
| <i>Project duration:</i> | 11/2013 – 10/2016  |
| <i>Funding sum:</i>      | EUR 530,214 (EU contribution for partner UNIVIE)   |

*Summary:* “PRECIOUS: PREventive Care Infrastructure based On Ubiquitous Sensing” will provide a preventive care system to promote healthy lifestyles, which is comprised of three components: (1) Transparent sensors for monitoring user context and health indicators (food intake, sleep and activity), which deliver ambient data about current user behavior; (2) Users are represented by individual virtual models which allow inferring of health risks and desired behavioral changes; (3) State-of-the-art motivational techniques (originating especially from gamification and motivational interview ) trigger a set of feedback tools to change the user habits toward more healthy conduct.

While related projects usually focus on developing specific sensors, middleware solutions, health monitoring systems, e-health services, etc., both the individual virtual model and the associated motivational tools will provide key innovation steps towards a preventive care system with measurable impact on user behavior and thus a clear potential for large-scale commercialization and sustainable societal footprint (e.g. with respect to cost saving in the public health sector as well as life quality improvements).

To reach these ambitious goals, the PRECIOUS consortium gathers partners from academia, SMEs and hospitals with comprehensive expertise in networking, pervasive sensing, cognitive analysis, nutrition research, semantic technologies and motivational techniques. We have chosen to focus on type II diabetes as a central use case, while our prototype will be easily adaptable also to other lifestyle-induced diseases. The system will not only detect and communicate detailed early warning signs, but also provide forecasts of future developments and associated problems (if change recommendations are not followed). Extensive lab- and field-based user trials will demonstrate the efficacy of the PRECIOUS system and prove its positive and lasting impact on individual quality of life as well as public health sector development.

*Own research contributions:*

- Socio-economic framework, business models for preventive care
- User trials for prototype validation

*Project homepage:* <http://www.thepreciousproject.eu>

### 10. ETICS: Economics and Technologies for Inter-Carrier Services

|                          |   |
|--------------------------|---|
| <i>Function:</i>         | Technical and administrative coordinator FTW, leader Task 3.3   |
| <i>Project type:</i>     | EU FP7 Integrated Project (grant agreement no. 248567)  |
| <i>Project partners:</i> | Alcatel-Lucent Bell Labs France, Alcatel-Lucent Italy, RAD Data Communication, British Telecom, Deutsche Telekom, France Telecom Orange Labs, Telefonica, Telenor, Marben Products, Nextworks, Athens University of Economics and |

Business, Telecommunications Research Center Vienna, Institut Telecom Paris, Politecnico di Milano, Université de Versailles, Israel Institute of Technology Technion

*Project duration:* 01/2010 – 03/2013

*Funding sum:* EUR 632,787 (EU contribution for partner FTW)

*Summary:* ETICS aims at creating a new ecosystem of innovative QoS-enabled interconnection models between Network Service Providers allowing for a fair distribution of revenue shares among all the actors of the service delivery value-chain. To this end, we will propose and analyze new business and regulatory models for converged infrastructures, taking into account applications' QoS constraints and incentives for carriers to invest and collaborate to the deployment of advanced high quality network interconnections. This will provide new market and revenue opportunities enabling innovative blended services and new high performance demanding applications.

To achieve these objectives, ETICS will analyse, specify and implement new network control, management and service plane technologies for the automated end-to-end QoS-enabled service delivery across heterogeneous carrier networks. ETICS includes a large number of partners that, participating to several key projects, have matured strong expertises. ETICS prototypes on control, management, and service planes will also leverage an important background on implementations and performance assessment. They will allow demonstrating and testing the effectiveness of new business models as well as how agile network service creation, activation, monitoring and billing for interconnected fixed and mobile operators will improve time to market of new services and reduce operational costs and complexity. Therefore, increasing the economic efficiency of access and transport infrastructures, the transition to new generation equipments will be incentivized.

ETICS validated new business models, architectures and protocols will be demonstrated and disseminated at key scientific and industrial workshops, conferences and standard bodies on technical, business, regulatory and socioeconomic aspects, providing a clear opportunity for Europe to take the lead on future converged infrastructures based on Internet/NGN evolutions.

*Own research contributions:*

- Charging mechanisms for future convergent All-IP architectures
- Pricing interactive multimedia services

*Project homepage:* <https://www.ict-etics.eu/>

## 11. A2-POWER: Performance Management over Wired Networks

*Function:* Senior Researcher, Leader of WP6 on “Billing Aspects of Performance Management”

*Project type:* Application-oriented project at the Telecommunications Research Center Vienna (FTW)

*Project partners:* Alcatel Austria, Telekom Austria, Ericsson, Kapsch CarrierCom, TU Vienna (Institut für Breitbandkommunikation, IBK)

*Project duration:* 12/2001 – 11/2003

*Summary:* A2 is tackling the topic of end-to-end performance management in the sense of a Telecommunications Management Network (TMN), and takes care of the following problems: development of an overall concept for the management of heterogeneous networks, adaptation of the function blocks for end-to-end performance management as

defined in ITU-T M.3400 to be used for circuit-switched as well as for packet-oriented networks, analysis of future key technologies in the carrier networks and in the TMN, analysis of mathematical algorithms for long range forecasts on the performance of heterogeneous networks (including neural networks), analysis of possible synergies between performance management and billing (common usage of data/algorithms and use of pricing schemes to manage the performance of a heterogeneous high-speed network).

*Own research contributions:*

- Analysis of synergies between pricing and performance management
- Application of the Cumulus Pricing Scheme to manage heterogeneous networks

*Project homepage:* <http://www.ftw.at/ftw/research/projects/ProjekteFolder/A2>

## 12. **IST-MobyDick: Mobility and Differentiated Services in Future IP Networks**

*Function:* Senior Researcher, responsible contact person for FTW

*Project type:* European FP5 Project IST-2000-25394

*Project partners:* Deutsche Telekom (Coordinator), NEC Europe, University Carlos III Madrid, ETH Zurich, University of Stuttgart, FOKUS Berlin, Portugal Telecom Inovacao, Centre de Recherche de Motorola Paris, EURECOM Sophia-Antipolis, University of Cracow, FTW Vienna, ICR Singapore

*Project duration:* 01/2001 – 12/2003

*Summary:* In order to continue to evolve 3rd Generation mobile and wireless infrastructure towards the Internet - targeting IST 2000 IV 5.2 "Terrestrial Wireless System and Networks", the project Moby Dick defines, implements, and evaluates an IPv6-based mobility-enabled end-to-end QoS architecture starting from the current IETF's QoS models, Mobile-IPv6, and AAA framework. A representative set of interactive and distributed multimedia applications serves to derive system requirements for the verification, validation, and demonstration of the Moby Dick architecture in a testbed comprising UMTS, 802.11 Wireless LANs and Ethernet.

*Own research contributions:*

- Charging and accounting in 3G networks
- AAAC

*Project homepage:* <http://www.ist-mobydick.org>

## 13. **A0: Foundation and Experimental Framework for High Performance Networking**

*Function:* Senior Researcher, leader of WP4 on Billing, Pricing Accounting (BiPA)

*Project type:* Strategic project at the Telecommunications Research Center Vienna (FTW)

*Project partners:* all members of FTW

*Project duration:* 07/1999 – 06/2003

*Summary:* The main contribution of the project A0 has been to research mechanisms for guaranteed QoS and to optimise efficiency in the Internet. The project has focused on

the following topics: mechanisms and architectures optimally supporting QoS requirements of real-time traffic like voice and video, performance evaluation of traffic control mechanisms like end-to-end congestion control and queue (including scenarios in fixed and wireless 3G networks), charging mechanisms for billing, pricing, and accounting of Internet Differentiated Services and economical approaches in combination with mathematical optimisation for admission control in MPLS networks, implementation of a prototypical SIP/H.323 signalling gateway, investigation of adaptive multipath routing and efficient load balancing over realistic Internet topologies, and verification of the accuracy of simulation tools using the A0 testbed.

*Own research contributions:*

- Internet Economics: fundamentals and applications (e.g. to MPLS resource provisioning)
- Efficient billing of telecommunication services
- Adaptive multipath routing (contributions to the AMP algorithm)
- TCP active queue management

*Project homepage:* <http://www.ftw.at/ftw/research/projects/ProjekteFolder/A0>

#### **14. IST-M3I: Market-Managed Multiservice Internet**

*Function:* Senior Researcher, workpackage leader WP4.1 “ISP Cost Modelling”, responsible contact person for FTW

*Project type:* European FP5 Project IST-1999-11429

*Project partners:* Hewlett-Packard European Laboratories (Coordinator), Athens University of Economics and Business, Darmstadt University of Technology, British Telecom Research, ETH Zürich, Telenor Research, FTW Vienna

*Project duration:* 01/2000 – 12/2001

*Summary:* The goal of this project has been to design, implement and trial a next generation system which will enable Internet resource management through market forces, specifically by enabling differential charging for multiple levels of service. The project has designed and prototyped a system that can charge and account for multiple levels of Internet service, and has analysed the implications of so doing. The feasibility of managing the allocation of Internet resources using relatively direct market forces has been established in technical and commercial terms, including requirements analysis, engineering design and prototyping, cost and business modelling, and Internet market modelling. Finally, the reaction of relatively sophisticated applications to economic signals from the Internet have been demonstrated, and our understanding of typical customer reaction and the effect on total system performance has been reported.

*Own research contributions:*

- Service-oriented cost models for Internet Service Providers
- Evaluation and Adaptation of the Cumulus Pricing Scheme (CPS) for the M3I Charging and Accounting System (CAS)

*Project homepage:* <http://www.m3i.org>

#### **15. SNF-ANAISOFT – Advanced Network and Agent Infrastructure for the Support of Federations of Workflow Trading Systems**

*Function:* Researcher  
*Project type:* Swiss National Science Foundation Project (SNF 5003-057753/1)  
*Project partners:* ETH Zurich, University of Geneva, University of Berne, EPF Lausanne, University of Zurich, Etat de Vaud, SER Systems, The Net-Internet Services AG  
*Project duration:* 01/2000 – 04/2002

*Summary:* This project proposes to study the creation of secure and responsive Federations of Workflow Trading Systems (FWTS) using intelligent and mobile agent technology. In workflow trading systems, bidding protocols, structure of catalogues and ways to describe activities can vary from case to case, depending on the application domains. A high degree of flexibility is needed to cope with the specifics of each marketplace. Moreover, depending on the needs of insourcers and outsourcers, electronic markets might be composed either of small and/or privately owned markets, or of open markets with large numbers of unknown actors; if the volume of trading and of requested workflow executions augment, the performance of the system must remain stable. Efficiency may then be ensured by extensions with new trading systems for sharing the load. Hence, by organizing multiple trading systems as a federation, these flexibility and performance issues have been investigated.

*Own research contributions:*

- Charging for Virtual Private DiffServ Networks

*Project homepage:* <http://www.tik.ee.ethz.ch/~anaisoft/>

## 16. SNF-CATI – Charging and Accounting Technology for the Internet

*Function:* Researcher  
*Project type:* Swiss National Science Foundation Project (SNF 5003-054559/1 CAPIV)  
*Project partners:* ETH Zurich, University of Geneva, University of Berne, Switch Zurich, IBM Zurich Research Lab, University of Zurich  
*Project duration:* 07/1998 – 03/2000

*Summary:* The SNF-SPP project CATI investigates charging and billing of reservation-based (IntServ) as well as aggregation-based (DiffServ) approaches both in the Internet and in Internet-based Virtual Privat Networks (VPNs). Based on dedicated cost and business models a demonstrator (VoIP phone) is used for applying and evaluating the developed charging and accounting protocols as well as the models themselves in a productive Internet. Thus, the main goals of the CATI project cover the following topics: (1) design and implementation of charging and accounting mechanisms based on currently available protocols of the Internet protocol suite (focussing on secured, reservation-based approaches), (2) design and implementation of a VPN configuration service including charging and accounting functions, best-effort services, differentiated services alternatives, fairness and congestion control, and (3) development of generic support functionality (APIs) for Internet-based open Electronic Commerce.

*Own research contributions:*

- Invention of the Cumulus Pricing Scheme (CPS)
- Pricing and cost recovery for Internet services
- Time-scale aspects of Internet tariff design

- Pricing of multiclass traffic in loss networks

*Project homepage:* <http://www.tik.ee.ethz.ch/~cati/>

## Participation in International Research Networks

### 17. **MENEUR: Modélisation en Economie des réseaux et NEUtralité du Net (Network Economics and Net Neutrality Modeling)**

*Function:* Key Researcher, FTW representative

*Project type:* INRIA ARC Project

*Project partners:* EPI INRIA (Dionysos, Maestro, Mescal), Télécom Bretagne, FTW, Columbia University, Pennsylvania State University, Alcatel-Lucent Bell Labs France, Orange Labs

*Project duration:* 2011-2012

*Summary:* The goal of this project is to study the interest of network neutrality, a topic that has recently gained a lot of attention. The project aims at elaborating mathematical models that will be analyzed to investigate its impact on users, on social welfare and on providers' investment incentives, among others, and eventually propose how (and if) network neutrality should be implemented. It brings together experts from different scientific fields (telecommunications, applied mathematics, economics), mixing academy and industry, to discuss those issues. It is a first step towards the elaboration of a European project.

*Own research contributions:*

- Network neutrality analysis from a provider's perspective

*Project homepage:* [http://www.irisa.fr/dionysos/pages\\_perso/tuffin/MENEUR/](http://www.irisa.fr/dionysos/pages_perso/tuffin/MENEUR/)

### 18. **QUALINET: European Network on Quality of Experience in Multimedia Systems and Services (COST IC1003)**

*Function:* Austrian National Delegate, STSM coordinator (2010-2012)

*Project type:* EU FP7 COST Action

*Project partners:* Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Macedonia, Malta, Norway, Portugal, Serbia, Slovenia, Spain, Sweden, Switzerland, United Kingdom

*Project duration:* 11/2010 – 11/2014

*Summary:* The goal of this action is to establish a strong network on Quality of Experience (QoE) with participation from both academia and industry. Its main objective will be to develop and to promote methodologies to subjectively and objectively measure the impact in terms of quality of future multimedia products and services. This network will leverage on QoMEX, an already established international conference on Quality of Multimedia Experience, for researchers and professionals to interact and to report their findings on QoE issues. Observing that there are currently no European networks focussing on the concept of QoE, this action also aims at bringing a substantial scientific impact

on fragmented efforts carried out in this field, by coordinating the research under the catalytic COST umbrella, and at setting up a European network of experts facilitating transfer of technology and know-how to industry, coordination in standardization, and certification of products and services.

*Own research contributions:*

- Fundamental laws governing QoE
- Economic aspects of Quality of Experience

*Project homepage:* available soon

## **19. ECONTEL: A Telecommunications Economics COST Network (COST IS0605)**

*Function:* Austrian National Delegate/Project Coordinator and Chair WG 4

*Project type:* EU FP7 COST Action

*Project partners:* Austria, Belgium, Cyprus, Denmark, Georgia, Germany, Greece, Hungary, Ireland, Israel, Netherlands, Norway, Poland, Romania, Slovenia, Switzerland, United Kingdom

*Project duration:* 06/2007 – 09/2011

*Summary:* The goal of ECONTEL is to develop a strategic research and training network linking key individuals and organizations in order to enhance Europe's competence in the field of telecommunications economics, to support related R&D-initiatives, and to provide guidelines and recommendations to European players (end-users, enterprises, operators, regulators, policy makers, content providers) concerning the provision to citizens and enterprises of new converged broadband and wireless content delivery networks. ECONTEL coordinates the development of research methodologies and tools from engineering, media and business research. Regulatory issues helping or hindering the adoption of economically efficient services are identified. ECONTEL mobilizes the "critical mass" and diversity of economists, business research experts, engineers, and scientists working in communications and content economics.

*Own research contributions:*

- Charging mechanisms for future convergent All-IP architectures
- Pricing interactive multimedia services

*Project homepage:* <http://www.cost605.org>

## **20. E-NEXT: Emerging Networking Experiments and Technologies**

*Function:* Senior Researcher

*Project type:* EU FP6 Network of Excellence

*Project partners:* Universidad Carlos III de Madrid (Coordinator), Universitat Politecnica de Catalunya, Telefónica, Universidad Politécnica de Madrid, University of Lancaster, University of Cambridge, University College London, University Pierre & Marie Curie, CNRS, INRIA, Institut EURECOM, Université de Liège, Université Catholique de Louvain, Universidade de Coimbra, Portu-



gal Telecom Inovacao, ADETTI, Technische Universiteit Delft, University of Twente, University of Athens, University of Patras, KTH Stockholm, Swedish Institute of Computer Science, Consorzio Interuniversitario Nazionale per l'Informatica, Politecnico di Torino, Università di Pisa, Università degli Studi di Trento, Fraunhofer-Gesellschaft, Technical University of Darmstadt, Universität Mannheim, Technische Universität Braunschweig, Helsinki University of Technology, Tampere University of Technology, Technical University of Denmark, FTW Vienna, National University of Ireland, ETH Zurich, AGH University of Technology, University of Oslo, Budapest University of Technology and Economics, University of Cyprus, Reykjavík University

*Project duration:* 01/2004 – 12/2005

*Summary:* As a merging of COST 263 on Quality of Future Internet Services and COST 264 on Networked Group Communication, E-NEXT focuses on Internet protocols and services. The general objective of E-NEXT is to reinforce European scientific and technological excellence in the networking area through a progressive and lasting integration of research capacities existing in the European Research Area. E-NEXT research interests include QoS in the large (e.g. dependability), programmable networks and networks on demand, multimedia content distribution infrastructure, Next Generation Internet including IPv6 and Grid, as well as accounting, security and management.

*Own research contributions:*

- Billing, charging and pricing models for future Internet services
- Trace-based perceptual VoIP quality evaluation (together with KTH Stockholm)

*Project homepage:* <http://www.ist-e-next.org>

# Publications

## Awards and Distinctions

- 2012 4<sup>th</sup> International Workshop on Quality of Multimedia Experience (QoMEX 2012): **Best Poster Award** for the paper "*The QoE Alchemy: Turning Quality into Money. Experiences with a Refined Methodology for the Evaluation of Willingness-to-Pay for Service Quality*" (co-authors: A. Sackl, S. Egger, P. Zwickl)
- 2010 9<sup>th</sup> Conference of Telecommunication, Media and Internet Techno-Economics (CTTE 2010): **Best Paper Award Runner-up** for the paper "*Economics of Logarithmic Quality-of-Experience in Communication Networks*" (co-authors: B. Tuffin, R. Schatz)
- 2010 8<sup>th</sup> International Conference on Pervasive Computing (PERVASIVE 2010): **Best Video Award** for the paper "*Touching the Untouchables: Vision-based Real-time Interaction with Public Displays through Mobile Touchscreen Devices*" (co-authors: M. Baldauf, P. Fröhlich)
- 2008 4<sup>th</sup> International Conference on Networking and Services (ICNS 2008): **Best Paper Award** for the paper "*A Generic Approach to Access Network Modeling for Next Generation Network Applications*" (co-authors: J. Fabini, A. Poropatich)
- 2004 8<sup>th</sup> International Conference on Spoken Language Processing (ICSLP/INTERSPEECH 2004): **Best Student Paper Award** for the paper "*Hot Discussion or Frosty Dialogue? Towards a Temperature Metric for Conversational Interactivity*" (co-author: F. Hammer)
- 2004 11<sup>th</sup> International Telecommunications Network Strategy and Planning Symposium (NETWORKS 2004): **Best Paper Award** for the paper "*Multi-Period Auctions for Network Resources*" (co-authors: S. Wrzaczek, S. Bessler)

## Books, Proceedings and Special Journal Issues

1. P. Reichl, M. Fiedler, S. Möller (guest editors): *Quality of Experience – Buzzword or Paradigm*. Themenheft 01/2014 of „Praxis der Informationsverarbeitung und Kommunikation“ (PIK). K. Saur Verlag, München, October 2014.
2. B. Stiller, B. Tuffin, P. Reichl, T. Anh Trinh (guest editors): *Socio-economic Issues of Next Generation Networks*. Special issue of Telecommunication Systems Journal, vol. 52, no. 2. Springer, February 2013.
3. P. Reichl, B. Stiller, B. Tuffin (editors): *Network Economics for Next Generation Networks*. Springer LNCS 5539, May 2009.
4. B. Stiller, P. Reichl, B. Tuffin (editors): *Performability Has Its Price*. Springer LNCS 4033, June 2006.
5. J. Solé-Pareta, M. Smirnov, P. Van Mieghem, J. Domingo-Pascual, E. Monteiro, P. Reichl, B. Stiller, R. Gibbens (editors): *Quality of Service in the Emerging Network Panorama*. Springer LNCS 3266, Oct. 2004.

6. B. Stiller, M. Karsten, Lee McKnight, P. Reichl (guest editors): *Internet Economics - Pricing and Policies*. Special issue of Journal of Computer Networks. Elsevier, Sept. 2004.
7. M. Karsten, P. Reichl, B. Stiller (guest editors): *Internet Pricing and Charging - Algorithms, Technology and Applications*. Special issue of Journal of Computer Communications. Elsevier, April 2004.
8. B. Stiller, G. Carle, M. Karsten, P. Reichl (editors): *Group Communications and Charges: Technology and Business Models*. Springer LNCS 2826, Oct. 2003.
9. P. Reichl (guest editor): *Forschung im Zentrum*. Themenheft 04/2002 of „Praxis der Informationsverarbeitung und Kommunikation“ (PIK). K. Saur Verlag, München, Dez. 2002.
10. B. Stiller, M. Smirnov, M. Karsten, P. Reichl (editors): *From QoS Provisioning to QoS Charging*. Springer LNCS 2511, Oct. 2002.
11. M. Karsten, P. Reichl, B. Stiller: *Advanced Internet Charging and QoS Technologies*. In: K. Bauknecht, W. Brauer, Th. Mück (eds.): *Informatik 2001 – Wirtschaft und Wissenschaft in der Network Economy*. Vol. I pp. 95–180. Österreichische Computergesellschaft, OCG, Wien 2001.
12. P. Reichl: *Dynamic Traffic and Tariff Modeling for Communication Networks*. Ph.D. thesis, D82, Aachen, May 2000.
13. O. Spaniol, M. Schuba, P. Reichl, G. Schneider: *Local Networks [Lokale Netze]*. Augustinus-Verlag Aachen, 1998.
14. C. Linnhoff-Popien, P. Reichl: *Network Management [Netzmanagement]*. Augustinus-Verlag Aachen, 1996.
15. O. Spaniol, C. Popien, P. Reichl, M. Schuba: *Operating Systems [Systemprogrammierung]*. Augustinus-Verlag Aachen, 1996.

## Journal Papers

1. P. Reichl, B. Tuffin, R. Schatz: *Logarithmic Laws in Service Quality Perception: Where Microeconomics Meets Psychophysics and Quality of Experience*. Telecommunication Systems Journal (Springer), Volume 52, Issue 2 (2013), page 587-600.
2. A. Ghezzi, M. Georgiadis, P. Reichl, N. Le Sauze, C. Dicaiano-Gilfedder, R. Mangiaracina: *Generating Innovative Interconnection Business Models for the Future Internet*. In: info – the journal of policy, regulation and strategy for telecommunications, information and media, vol. 15 no. 4, Emerald, June 2013.
3. W. Reichl, P. Reichl, P. Reichel: *Out of the Wireless Access Bottleneck Trap: Technologies, Economics, Regulation and Standardization Perspectives*. e&i Elektrotechnik und Informationstechnik, vol. 129 no. 6, pp. 400-406, Springer, Oct. 2012.
4. C. Egger, M. Happenhofer, J. Fabini, P. Reichl: *Collapse Detection and Avoidance for SIP Systems*. PIK - Praxis der Informationsverarbeitung und Kommunikation, vol. 35 no. 2, pp. 91–99, De Gruyter, May 2012.
5. P. Reichl: *From Charging for Quality-of-Service to Charging for Quality-of-Experience*. Annals of Telecommunications, special issue on “Quality of Experience and Socio-

- Economic Issues of Network-Based Services”, Volume 65, Issue 3, pp. 189–199, Springer, 2010.
6. I. Gojmerac, P. Reichl, L. Jansen: *Towards Low-complexity Internet Traffic Engineering: The Adaptive Multi-Path Algorithm*. Journal of Computer Networks, Special Issue on "Complex Computer and Communication Networks", vol 52, pp. 2894–2907, Dec. 2008.
  7. J. Fabini, R. Pailer, P. Reichl: *Location-Based Assisted Handover for the IP Multimedia Subsystem*. Journal of Computer Communications, vol. 31 no. 10, pp. 2367–2380, June 2008.
  8. P. Reichl: *How to Define Conversational Interactivity: A Game-Theoretic Approach and Its Application in Telecommunications*. Journal of Information Technologies and Control (JITC), No. 3-4/2006, pp. 18–24, printed Feb. 2007.
  9. P. Reichl, S. Bessler, J. Fabini, R. Pailer, A. Poropatich, N. Jordan, R. Huber, H. Weisgrab, C. Brandner, I. Gojmerac, M. Ries, F. Wegscheider: *Practical Experiences with an IMS-Aware Location Service Enabler on Top of an Experimental Open Source IMS Core Implementation*. Journal of Mobile Multimedia (JMM), vol. 2 no. 3, pp. 189–224, 2006.
  10. P. Reichl, J. Fabini, N. Jordan, R. Huber, A. Poropatich, Chr. Brandner, H. Weisgrab: *Quo Vadis, IMS? Das Projekt CAMPARI als mobilnetz-orientierte Standortbestimmung für das IP Multimedia Subsystem* (Quo Vadis, IMS? Perspectives for the IP Multimedia Subsystem in a Mobile Networking Context) [in German]. e&i 123 no. 7/8 (special issue on Next Generation Networks), pp. 315–322. Springer, August 2006.
  11. F. Hammer, P. Reichl, T. Nordström, G. Kubin: *Corrupted Speech Data Considered Useful: Improving Perceived Speech Quality of VoIP Over Error-Prone Channels*. Acta Acustica, 2004.
  12. P. Reichl, D. Hausheer, B. Stiller: *The Cumulus Pricing Model as an Adaptive Framework for Feasible, Efficient and User-friendly Tariffing of Internet Services*. Journal of Computer Networks, vol. 43 (1), pp. 3–24, Elsevier, Sept. 2003.
  13. B. Stiller, P. Reichl, J. Gerke, H. Hasan, P. Flury: *Charging and Accounting in High-speed Networks*. Journal on Future Generation Computing Systems 19 (2003) 101–109, Elsevier 2003.
  14. W. Haidegger, P. Reichl, S. Bessler, N. Jozefiak, M. Teufel: *End-to-end Performance Management in Heterogeneous High-speed Networks*. PIK - Praxis der Informationsverarbeitung und Kommunikation (De Gruyter), 4/2002 (in German).
  15. E. Plasser, T. Ziegler, P. Reichl, G. Mittenecker: *Internet Services Beyond Best Effort*. e&i 2/2002, pp. 30–36.
  16. B. Stiller, P. Reichl, J. Gerke, P. Flury: *A Generic and Modular Internet Charging System for the Cumulus Pricing Scheme*. Journal of Network and Systems Management, JNSM, Vol. 3, No. 9, pp. 293–325, Sept. 2001.
  17. B. Stiller, P. Reichl, S. Leinen: *Pricing and Cost Recovery for Internet Services: Practical Review, Classification and Application of Relevant Models*. NETNOMICS - Economic Research and Electronic Networking, Baltzer, The Netherlands, Vol. 3, No. 1, March 2001.

## Reviewed Conference and Workshop Papers

### Telecommunication Economics

1. P. Zwickl, P. Reichl, A. Sackl: *The 15 Commandments of Market Entrance Pricing for Differentiated Network Services: An Antagonistic Analysis of Human vs. Market*. Proc. 17<sup>th</sup> International GI/ITG Conference on Measurement, Modeling and Evaluation of Computing Systems and Dependability and Fault-Tolerance (MMB&DFT 2014), Bamberg, Germany, March 2014.
2. P. Zwickl, A. Sackl, P. Reichl: *Market Entrance, User Interaction and Willingness-to-Pay: Exploring Fundamentals of QoE-based Charging for VoD Services*. Proc. IEEE GLOBECOM'13, Atlanta, GA, USA, December 2013.
3. A. Sackl, P. Zwickl, P. Reichl: *The Trouble with Choice: An Empirical Study to Investigate the Influence of Charging Strategies and Content Selection on QoE*. Proc. 8<sup>th</sup> International Workshop on Advanced Internet Charging and QoS Technology (ICQT'13), Zurich, Switzerland, October 2013.
4. P. Zwickl, P. Reichl: *Graph-Theoretic Roots of Value Network Quantification*. Proc. 19th EUNICE Workshop on Advances in Communication Networking, Chemnitz, Germany, August 2013.
5. P. Reichl, P. Maillé, P. Zwickl, A. Sackl: *A Fixed-Point Model for QoE-based Charging*. Proc. ACM SIGCOMM 2013 Workshop on Future Human-Centric Multimedia Networking, pp. 33-38, Hong Kong, China, August 2013.
6. A. Sackl, P. Zwickl, P. Reichl: *QoE Alchemy 2.0: An Improved Test Setup for the Pecuniary Bias of QoE*. 5<sup>th</sup> International Workshop on Quality of Multimedia Experience (QoMEX'13), Klagenfurt, Austria, July 2013.
7. P. Reichl, P. Zwickl, C. Löw, P. Maillé: *How Paradoxical is the "Paradox of Side Payments"? Notes from a Network Interconnection Perspective*. Proc. 11<sup>th</sup> International Conference on Wired/Wireless Internet Communications (WWIC'13), St. Petersburg, Russia, June 2013.
8. A. Sackl, P. Zwickl, S. Egger, P. Reichl: *The QoE Alchemy: Turning Quality into Money. Experiences with a Refined Methodology for the Evaluation of Willingness-to-Pay for Service Quality*. 4<sup>th</sup> International Workshop on Quality of Multimedia Experience (QoMEX'12), Yarra Valley, Australia, July 2012.
9. S. Wahlmüller, P. Zwickl, P. Reichl: *Pricing and Regulating Quality of Experience*. Proc. 8<sup>th</sup> Euro-NF Conference on Next Generation Internet (NGI'12), Karlskrona, Sweden, June 2012.
10. J. Poměnková, M. Ries, P. Reichl: *Saturation Boundary Estimation for Social Networks*. Proc. 11<sup>th</sup> Conference of Telecommunication, Media and Internet Techno-Economics (CTTE'12), Athens, Greece, June 2012.
11. P. Zwickl, P. Reichl: *An Instance-based Approach for the Quantitative Assessment of Key Value Network Dependencies*. Proc. ETICS Workshop @ IFIP NETWORKING'12, Prague, Czech Republic, May 2012. Springer LNCS.
12. P. Reichl, I. Gojmerac, D. Barth, M. Krichen, J. Cohen, O. Marcé, W. Wiedermann: *Techno-Economics of Small Cell Networks: The AWARE Project*. Proc. International Conference on NETWORK Games, CONTROL and OPTimization (NetGCooP'11), Paris, France, October 2011.

13. P. Zwickl, P. Reichl, A. Ghezzi: *On the Quantification of Value Networks: A Dependency Model for Interconnection Scenarios*. Proc. 7<sup>th</sup> International Workshop on Internet Charging and QoS Technology (ICQT'11), Paris, France, October 2011.
14. P. Zwickl, P. Reichl, A. Ghezzi, F. Johansen, H. Lønsethagen, M. Georgiades, C. Di Cairano-Gilfedder: *ASQ Meta-Scenarios: A Generalized Approach for Requirements Classification of Interconnection Goods*. Proc. 10th Conference of Telecommunication, Media and Internet Techno-Economics (CTTE'11), Berlin, Germany, May 2011.
15. P. Reichl, B. Tuffin, R. Schatz: *Economics of Logarithmic Quality-of-Experience in Communication Networks*. Proc. 9th Conference of Telecommunication, Media and Internet Techno-Economics (CTTE), Ghent, Belgium, June 2010.
16. A. Hanemann, D. Hausheer, P. Reichl, B. Stiller, P. van Daalen: *Investigating the Economic Feasibility of Bandwidth-on-Demand Services for the European Research Networks*. 3<sup>rd</sup> Workshop on Bandwidth on Demand and Federation Economics (BoD'10), Osaka, Japan, April 2010.
17. P. Reichl, J. Fabini, M. Happenhofer, C. Egger: *From QoS to QoX: A Charging Perspective*. Proc. 18<sup>th</sup> ITC Specialist Seminar on "Quality of Experience", Blekinge Institute of Technology, Karlskrona, Sweden, May 2008.
18. P. Kurtansky, P. Reichl, B. Stiller: *The Evaluation of the Efficient Prepaid Scheme TICA for All-IP Networks and Internet Services*. Proc. 10<sup>th</sup> IEEE/IFIP Symposium on Integrated Management (IM'07), Munich, Germany, May 2007.
19. P. Reichl, J. Fabini, P. Kurtansky, B. Stiller: *A Stimulus-Response Mechanism for Charging Enhanced Quality-of-User Experience in Next Generation All-IP Networks*. Proceedings XIII Conferencia Latino-Ibero-Americana de Investigación de Operaciones (CLAIO 2006), Montevideo, Uruguay, November 2006.
20. P. Reichl, F. Hammer: *Charging for Quality-of-Experience – a New Paradigm for Pricing IP-based Services*. Proceedings 2<sup>nd</sup> ISCA Tutorial and Research Workshop on Perceptual Quality of Systems, pp. 171-177, Berlin, Germany, Sept. 2006.
21. P. Kurtansky, P. Reichl, J. Fabini, T. Lovric, B. Stiller: *Efficient Prepaid Charging for the 3GPP IP Multimedia Subsystem (IMS)*. Proc. 9<sup>th</sup> World Conference on Integrated Design & Process Technology (IDPT'06), Session on "Software Engineering Aspects and Processes of Economy-Oriented Solutions in Telecommunication Networks", San Diego, CA, USA, June 2006.
22. P. Reichl, S. Wrzaczek: *Equilibrium Market Prices for Multi-Period Auctions of Internet Resources*. 12th GI/ITG Conference on Measuring, Modelling and Evaluation of Computer and Communication Systems (MMB) together with 3rd Polish-German Teletraffic Symposium (PGTS), Dresden, Germany, September 2004.
23. S. Wrzaczek, P. Reichl, S. Bessler: *Multi-period Auctions for Network Resources*. Proc. of NETWORKS 2004, Vienna, Austria, June 2004.
24. P. Reichl, S. Bessler, B. Stiller: *Second-chance Auctions for Multimedia Session Pricing*. Proc. MIPS 2003, Naples, Italy, Nov. 2003.
25. H. Ma, D. Hausheer, P. Reichl, B. Stiller: *A Simulation Model for the Cumulus Pricing Scheme*. Applied Telecommunication Symposium (ATS'02), Advanced Simulation Technologies Conference, San Diego, CA, April, 2002.
26. P. Reichl, B. Stiller: *Edge Pricing in Space and Time: Theoretical and Practical Aspects of the Cumulus Pricing Scheme*. Proc. 17<sup>th</sup> International Teletraffic Congress (ITC-17),

- Salvador da Bahia, Brazil, Dec. 2001. In: J. De Souza, N. Da Fonseca, E. De Souza e Silva (eds.): *Teletraffic Engineering in the Internet Era*, Elsevier, 2001.
27. B. Stiller, J. Gerke, H. Hasan, P. Reichl, P. Flury: *Open Interfaces and Databases of a Modular Internet Charge Calculation and Accounting System*. Proc. GLOBECOM 2001, San Antonio, TX, Nov. 2001.
  28. P. Reichl, B. Stiller, Hongguang Ma, Hasan, J. Gerke, P. Flury: *Retrospective Pricing Models for Internet Services: Solving the Flat Rate Dilemma "à la Flensburg"*. Proc. Messung, Modellierung und Bewertung MMB'01, Aachen, September 2001.
  29. P. Reichl, B. Stiller, Th. Ziegler: *Charging Multidimensional QoS with the Cumulus Pricing Scheme*. Conference 4523 (Internet Performance and Control of Network Systems), SPIE ITCOM 2001, Denver, USA, August 2001.
  30. P. Reichl, P. Flury, J. Gerke, B. Stiller: *How to Overcome the Feasibility Problem for Tariffing Internet Services: The Cumulus Pricing Scheme*. Proc. IEEE ICC 2001, pp. 2079-2083, Helsinki, June 2001.
  31. B. Stiller, J. Gerke, Hasan, P. Reichl, P. Flury: *Charging for Differentiated Internet Services*. Proc. ITCOM'01, Denver, CO, 2001.
  32. P. Reichl, B. Stiller: *Nil Nove Sub Sole: Why Internet Charging Schemes look like as they do*. Proc. 4th Berlin Internet Economic Workshop IEW'2001, Berlin, May 2001.
  33. B. Stiller, J. Gerke, P. Reichl, P. Flury: *Management of Differentiated Services Usage by the Cumulus Pricing Scheme and a Generic Internet Charging System*. 7th IEEE/IFIP Integrated Network Management Symposium (IM 2001), Seattle, Washington, U.S.A., pp. 93-106, May 2001.
  34. B. Stiller, J. Gerke, P. Reichl, P. Flury, Hasan: *Charging Distributed Services of a Computational Grid Architecture*. IEEE International Symposium on Cluster Computing (CCGrid 2001), Workshop on Internet QoS for the Global Computing (IQ 2001), pp 596-601, May 2001
  35. P. Reichl, P. Kurtansky, J. Gerke, B. Stiller: *The Design of a Generic Service-oriented Cost Model for Service Providers in the Internet (COSMOS)*. Applied Telecommunications Symposium (ATS 2001), Seattle, Washington, U.S.A., April, 2001.
  36. P. Reichl, G. Fankhauser, B. Stiller: *Auction Models for Multiprovider Internet Connections*. Proc. Messung, Modellierung und Bewertung MMB'99. Trier (Germany), Sept. 1999.
  37. P. Reichl: *Approximated Price Functions for Dynamic Volume-Based Pricing of Multi-class Internet Traffic*. MMB'99, Trier, Germany, Sept. 1999.
  38. B. Stiller, G. Fankhauser, G. Joller, P. Reichl, N. Weiler: *Open Charging and QoS Interfaces for IP Telephony*. The Internet Summit (INET 99), San Jose, California, USA, June 1999.
  39. P. Reichl, S. Leinen, B. Stiller: *A Practical Review of Pricing and Cost Recovery for Internet Services*. 2nd Berlin Internet Economics Workshop IEW'99. Berlin, Germany, May 1999.

### **User Perception of Telecommunication Services and Quality-of-Experience**

40. P. Reichl: *It's the Ecosystem, Stupid: Lessons from an Anti-Copernican Revolution of User-centric Service Quality in Telecommunications*. 6<sup>th</sup> International Conference on

Developments in e-Systems Engineering (DeSE'13), Abu Dhabi, United Arab Emirates, December 2013.

41. A. Sackl, P. Zwickl, S. Egger, P. Reichl: *The Role of Cognitive Dissonance for QoE Evaluation of Multimedia Services*. Proc. Quality of Experience for Multimedia Communications Workshop (QoEMC), IEEE Globecom 2012, Anaheim, CA, Dec. 2012.
42. S. Egger, P. Reichl, T. Hossfeld, R. Schatz: *"Time is Bandwidth"? Narrowing the Gap between Subjective Time Perception and Quality of Experience*. Proc. IEEE International Conference on Communications (ICC'12) – Communication QoS, Reliability and Modeling Symposium, Ottawa, Canada, June 2012.
43. A. Sackl, P. Zwickl, P. Reichl: *From Quality of Experience to Willingness to Pay for Interconnection Service Quality*. Proc. ETICS Workshop @ IFIP NETWORKING'12, Prague, Czech Republic, May 2012. Springer LNCS.
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45. S. Egger, M. Ries, P. Reichl: *Quality-of-Experience Beyond MOS: Experiences with a Holistic User Test Methodology for Interactive Video Services*. Proc. 21st ITC Specialist Seminar on Multimedia Applications – Traffic, Performance and QoE. Phoenix Seagaia Resort, Miyazaki, Japan, March 2010.
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104. C. Egger, M. Hirschbichler, P. Reichl: *Enhancing SIP Performance by Dynamic Manipulation of Retransmission Timers*. Proc. 6<sup>th</sup> MMBNet Workshop, Hamburg, Germany, Sept. 2011.
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## Invited Papers and Book Chapters

1. M. Varela, L. Skorin-Kapov, K. De Moor, P. Reichl: *QoE – Defining Service Quality from the User’s Perspective*. In: C. Wen Chen, P. Chatzimisios, T. Dagiuklas, L. Atzori (eds.): “Multimedia Quality of Experience (QoE): Current Status and Future Requirements”. John Wiley & Sons, to appear 2014.
2. A. Perkis, P. Reichl, S. Beker: *Business Perspectives on QoE*. In: S. Möller, A. Raake (eds.): „Quality of Experience: Advanced Concepts, Applications and Methods”. Springer, to appear 2014.
3. S. Egger, P. Reichl, K. Schönenberg: *The Role of Interactivity for QoE*. In: S. Möller, A. Raake (eds.): „Quality of Experience: Advanced Concepts, Applications and Methods”. Springer, to appear 2014.
4. P. Reichl: *Quality of Experience in Convergent Communication Ecosystems*. In: A. Lugmayr, C. Dal Zotto, G. F. Lowe (eds.): “Convergent Divergence? Cross-Disciplinary Viewpoint on Media Convergence”. Springer, to appear 2014.
5. P. Reichl, P. Maillé, P. Zwickl, A. Sackl: *On the Fixpoint Problem of QoE-based Charging*. Invited paper, Proc. VALUETOOLS 2012, Cargèse, Corsica, France, October 2012.
6. P. Maillé, P. Reichl, B. Tuffin: *Internet Governance and Economics of Network Neutrality*. In: A. M. Hadjiantonis, B. Stiller (eds.): “Telecommunication Economics”. Springer LNCS 7216, pp. 108-116, 2012.
7. P. Reichl, B. Tuffin, P. Maillé: *Economics of Quality of Experience*. In: A. M. Hadjiantonis, B. Stiller (eds.): “Telecommunication Economics”. Springer LNCS 7216, pp. 158-166, 2012.
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9. P. Maillé, P. Reichl, B. Tuffin: *Of Threats and Costs: A Game-Theoretic Approach to Security Risk Management*. In: N. Gulpinar, P. Harrison, B. Rustem (eds.): “Performance Models and Risk Management in Communication Systems”. Springer, April 2011.
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11. M. Umlauft, P. Reichl: *Getting Network Simulation Basics Right – A Note on Seed Setting Effects for the ns-2 Random Number Generator*. In: S. Powell, P. Shim (eds.):

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12. J. Fabini, P. Reichl, C. Egger, M. Happenhofer, M. Hirschbichler, L. Wallentin: *Generic Access Network Emulation for NGN Testbeds*. Invited Paper, 4th ACM International Conference on Testbeds and Research Infrastructures for the Development of Networks & Communities (TRIDENTCOM’08), Innsbruck, Austria, March 2008.
  13. P. Reichl: *From ‘Quality-of-Service’ and ‘Quality-of-Design’ to ‘Quality-of-Experience’: A Holistic View on Future Interactive Telecommunication Services*. Invited Paper, 15th IEEE ComSoc International Conference on Software, Telecommunications and Computer Networks (SoftCOM’07), Split, Croatia, September 2007.
  14. S. Bessler, P. Reichl: *A Network Provisioning Scheme Based on Decentralized Bandwidth Auctions*. In: S. Raghavan, G. Anandalingam (eds.): “Telecommunications Planning: Innovations in Pricing, Network Design and Management”. Springer, Operations Research/Computer Science Interfaces Series, ISBN 0-387-29222-5, chapter 5, pp. 89 – 100, Jan 2006.
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## Further Publications and Scientific Contributions

1. P. Reichl, P. Maillé: *Stability Issues for the Fixed-Point Problem of QoE-based Charging in the Internet*. Extended Abstract, Proc. 11<sup>th</sup> International Conference on Operations Research, La Habana, Cuba, March 2014.
2. M. Fiedler, S. Möller, P. Reichl (eds.): *Quality of Experience: From User Perception to Instrumental Metrics*. Dagstuhl Seminar Proceedings 12181, Internationales Begegnungs- und Forschungszentrum für Informatik (IBFI), Schloss Dagstuhl, Germany, 2012. DOI 10.4230/DagRep. 2.5.1.
3. R. Schatz, P. Reichl: *Quality of Experience - More Than Just Another Buzzword?* 11<sup>th</sup> Würzburg Workshop on IP: Joint ITG and Euro-NF Workshop "Visions of Future Generation Networks" (EuroView’11), Würzburg, Germany, August 2011.
4. P. Reichl: *From QoS to QoE: Buzzword Issue or Anti-Copernican Revolution?* Keynote abstract, Proc. EuroNF Workshop on Traffic Management and Traffic Engineering for the Future Internet, p. 23, Dec. 2009.
5. M. Fiedler, K. Kilkki, P. Reichl (eds.): *From Quality of Service to Quality of Experience*. Dagstuhl Seminar Proceedings 09192, Internationales Begegnungs- und Forschungszentrum für Informatik (IBFI), Schloss Dagstuhl, Germany, 2009. URL: <http://drops.dagstuhl.de/portals/index.php?semnr=09192/>
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  9. P. Reichl: *From Charging for QoS to Charging for QoE: Internet Economics in the Era of Next Generation Multimedia Networks*. Extended Abstract, in: A. Bandara and M. Burgess (eds.): *Autonomous Infrastructure, Management and Security*, Proc. ACM AIMS'07, Springer LNCS, June 2007.
  10. P. Reichl: *QoS has its Price: A Brief History of Internet Economics*. Plenary Lecture, Extended Abstract. Proceedings 5th RoEduNet IEEE International Conference, Sibiu, Romania, June 2006, ISBN (10) 973-739-277-9.
  11. P. Reichl: *Forschung im Zentrum* [Research in the Center, in German]. Editorial, Themenheft „Praxis der Informationsverarbeitung und Kommunikation“ (PIK), vol. 25 no. 4, K. Saur Verlag, München, Dez. 2002.
  12. P. Reichl: *Dynamic Traffic and Tariff Modeling for Communication Networks* [Dynamische Verkehrs- und Tarifmodellierung für den Einsatz in Kommunikationsnetzwerken]. *Praxis der Informationsverarbeitung und Kommunikation (PIK)*, vol. 24 (2001) no. 3. K. Saur Verlag München, Sept. 2001.
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  14. P. Reichl: *M. Hein/D. Griffiths: SNMPv2 in Theorie und Praxis*. Book review, *Praxis der Informationsverarbeitung und Kommunikation (PIK)*, 1997.
  15. R. J. Gibbens, P. Reichl: *A General Performance Bound Applied to Examples of Highly Connected Loss Networks*. IMA conference on "Complex Stochastic Systems and Engineering", Leeds, Sept 20-22, 1993.

## Standardization Contributions

1. P. Reichl, F. Hammer, G. Kubin: *A General Temperature Metric Framework for Conversational Interactivity*. ITU-T SG 12 Meeting, Delayed Contribution D.063(2005) Q7/8, Geneva, Switzerland, Oct. 2005
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3. F. Hammer, P. Reichl: *Conversational Interactivity*. Germany ETSI STQ #17-TD30; Frankfurt/M., Nov. 2004

## White Papers, Technical Reports, Unpublished Manuscripts



1. P. Le Callet, S. Möller, A. Perkis et al.: *Qualinet White Paper on Definitions of Quality of Experience. Output version of the Dagstuhl Seminar 12181*. Dagstuhl, June 2012.
2. P. Maillé, B. Tuffin, P. Reichl: *Economic Stakes of Network Security*. Unpublished, 2012.
3. A. Sackl, P. Zwickl, P. Reichl: *From Quality of Experience to the Readiness to Pay*. Technical Report, Telecommunications Research Center Vienna, Dec. 2011.
4. D. Barth, J. Cohen, M. Krichen, P. Reichl, O. Marcé: *Technoeconomic Model for Sharing Femto Access*. Technical Report, PRiSM, Université Versailles, 2010.
5. P. Reichl, R. Schatz, S. Egger, A. D'Alconzo: *The Logarithmic Nature of QoE and the Role of the Weber-Fechner Law in QoE Assessment*. Technical Report, FTW-TR-2009\_005, October 2009.
6. P. Reichl, G. Kubin, F. Hammer: *A General Temperature Metric Framework for Conversational Interactivity*. Technical Report, FTW-TR-2005-026, June 2005.
7. P. Reichl, S. Wrzaczek: *Multi-period Auctions of Internet Resources*. Technical Report FTW-TR-2004-008, February 2004.
8. W. Haidegger, P. Reichl: *The Synergies Between End-to-End Performance Management and Charging/Accounting*. Technical Report FTW-TR-2003-014, Dec. 2003
9. I. Gojmerac, Th. Ziegler, P. Reichl: *Adaptive Multi-Path (AMP) - a Novel Routing Algorithm for Dynamic Traffic Engineering*. Technical Report FTW-TR-2003-007, July 2003.
10. F. Hammer, G. Kubin, T. Nordström, P. Reichl, T. Ziegler: *Survey on quality aspects of interactive multimedia*. Technical Report, FTW-TR-2003-001, Feb. 2003.
11. B. Stiller, J. Gerke, H. Hasan, D. Hausheer, P. Kurtansky, P. Reichl: *Internet Economics 3*. TIK Report Nr. 127, February 2002.
12. B. Stiller, P. Flury, J. Gerke, H. Hasan, P. Reichl: *Internet Economics 2*. TIK Report Nr. 115, February 2001.
13. B. Stiller, P. Flury, J. Gerke, H. Hasan, P. Reichl: *Internet Economics 1*. TIK Report Nr. 105, February 2001.
14. P. Reichl, P. Kurtansky, J. Gerke, B. Stiller: *ISP Cost Model (ICOMO) Design*. ETH Zürich, TIK Report Nr. 99, December 2000.
15. P. Reichl, B. Stiller: *Notes on Cumulus Pricing and Time-scale Aspects of Internet Tariff Design*. ETH Zürich, TIK Report Nr. 97, November 2000.
16. B. Stiller, J. Gerke, P. Reichl, P. Flury: *The Cumulus Pricing Scheme and its Integration into a Generic and Modular Internet Charging System for Differentiated Services*. ETH Zürich, TIK Report Nr. 96, September 2000.
17. P. Flury, P. Reichl, J. Gerke, B. Stiller: *Charging Considerations for Virtual Private DiffServ Networks*. ETH Zürich, TIK Report Nr. 94, August 2000.
18. M. Rennhard, N. Weiler, P. Reichl, B. Stiller: *Evaluation of Charging and Accounting Extensions for RSVP - Description and Evaluation*. Deliverable CATI-TIK-DE-P-016-1.0, TIK, ETH Zurich, March 2000.

# Presentations

## Awards and Distinctions

2006 5<sup>th</sup> RoEduNet IEEE International Conference: **Distinguished Lecturer Award** for the Keynote Lecture "*QoS has its Price: A Brief History of Internet Economics*".

## Inaugural Lectures

1. "*Network-based Information and Communication Ecosystems: Where Communication Technology Meets Microeconomics and User-centred Research*". Inaugural Lecture, RBUCE WEST International Research Chair NICE (Network-based Information and Communication Ecosystems), Université Européenne de Bretagne / Télécom Bretagne, Rennes, France, 23.01.2013.

## Keynote Lectures

1. "*Towards Future Communication Ecosystems: Where Communication Technology Meets Microeconomics and the User*". Keynote Lecture, IEEE EuroCon 2013, Zagreb, Croatia, 01.07.2013.
2. "*What You Pay Is What You Get: The Economics of Quality of Experience in Fixed and Mobile Telecommunications*". Keynote Lecture, 2<sup>nd</sup> Joint ERCIM eMobility and MobicSense Workshop collocated with the International Conference on Wired/Wireless Internet Communications (WWIC'13), St. Petersburg, Russia, 04.06.2013.
3. "*Towards Future Ecosystems for Mobile Communication: an Interdisciplinary Perspective*". Keynote Lecture, 14<sup>th</sup> International Symposium on Wireless Personal Multimedia Communications (WPMC'11), Brest, France, 06.10.2011.
4. "*Towards Future Telecommunication Ecosystems*". Keynote Lecture, Final Workshop of SISCOM International Research Chair, Rennes, France, 19.09.2011.
5. "*From QoS to QoE: Buzzword Issue or Anti-Copernican Revolution?*" Keynote Lecture, 5<sup>th</sup> EuroNF Workshop on Traffic Management and Traffic Engineering for the Future Internet (EuroNFTraf09), Paris, France, 08.12.2009.
6. "*From 'Quality-of-Service' and 'Quality-of-Design' to 'Quality-of-Experience': A Holistic View on Future Telecommunication Services*". Keynote Lecture, IEEE ComSoc International Conference on Software, Telecommunications and Computer Networks (SoftCOM'07), Split, Croatia, 27.09.2007.
7. "*QoS has its Price: A Brief History of Internet Economics*". Keynote Lecture, 5<sup>th</sup> IEEE RoEduNet Conference, Sibiu, Romania, 03.06.2006.
8. "*User and Utility – Success Factors for Future Services*". Keynote Talk, Wiener Tag der Telekommunikation, Haus der Industrie, Vienna, Austria, 29.06.2005.
9. "*Trends in Internet Economics*". Keynote Lecture, 3<sup>rd</sup> Annual Workshop on Pricing and Optimization, PRiSM Lab, Université de Versailles, France, 08.10.2003.

## Invited Talks and Guest Lectures

1. "*What You See Is What You Pay: Notes on the Economics of Quality of Experience*". Invited Talk, Communication Systems Group, Department of Informatics, University of Zurich, Zurich, Switzerland, 02.09.2013.
2. "*Towards Future Communication Ecosystems: Where Technology Meets Microeconomics and the User*". Invited Talk, Institute for Computer Graphics and Algorithms, Vienna University of Technology, Vienna, Austria, 14.06.2013.
3. "*On the Fixpoint Problem of QoE Charging*". Invited Talk, Institute for Telecommunications, Vienna University of Technology, Vienna, Austria, 05.07.2012.
4. "*Towards Future Communications – an Interdisciplinary Perspective*". Guest Lecture, Laboratoire PRiSM, Université de Versailles Saint-Quentin-en-Yvelines, Versailles, France, 16.12.2011.
5. "*Quality of Experience – More Than a Buzzword*". Guest Presentation, QoE Workshop, Télécom SudParis, Evry, France, 19.07.2011.
6. "*Towards Future Communications – an Interdisciplinary Perspective*". Guest Lecture, Department of Communications and Networking, Aalto University Helsinki, Finland, 21.06.2011.
7. "*Future Communications – An Ecosystem Perspective*". Guest Lecture, Department of Computer Science, University of Vienna, 02.04.2011.
8. "*From Quality-of-Service to Quality-of-Experience: A Socio-Economic Perspective*". Habilitation Colloquium, Technical University Graz, Austria, 24.11.2010.
9. "*Logarithmic Laws for Perceptual Service Quality: Where Microeconomics Meets Psychophysics and Quality of Experience*". Invited Lecture on the occasion of the retirement of Prof. Otto Spaniol, Aachen, Germany, 27.09.2010.
10. "*Towards Future Telecommunication Ecosystems*". Guest Lecture, Télécom Bretagne Rennes, France, 13.09.2010.
11. "*Economics of Inter-Carrier Transport Services: The ETICS Perspective*". Invited Presentation, 3<sup>rd</sup> BIRD Workshop on Future Internet 2010 “Business Innovation and Regulation Challenges”, Stockholm, Sweden, 22.06.2010.
12. "*Challenges for Future Communication Systems: A Socio-Economic and User-centered Perspective*". Guest Lecture, Telecom SudParis, France, 14.09.2009.
13. "*Collaborative Communications – A Socio-Economic Perspective*". Guest Lecture, Department of Computer Science, University of Vienna, 16.01.2009.
14. "*Exploring Intuitive Interactivity: A Step Towards Mediated Creativity*". Guest Lecture, Institutskolloquium Informatik, Freie Universität Berlin, Germany, 09.10.2008.
15. "*Interactivity and Quality-of-Experience for Conversational Multimedia: Models – Metrics – Measurements*". Guest Lecture, INRIA Rennes/University Rennes 1, France, 28.08.2008.
16. "*Generic Access Network Emulation for NGN Testbeds*". Invited Talk, 4th ACM International Conference on Testbeds and Research Infrastructures for the Development of Networks & Communities (TRIDENTCOM’08), Innsbruck, Austria, 20.03.2008.

17. "*Out of the Flat Rate Trap? On the Role of Quality-of-Experience for Charging Communication Services*". Invited Talk, Dagstuhl Perspectives Seminar 08043 "Telecommunication Economics", Dagstuhl Castle, Germany, 25.01.2008.
18. "*From 'Quality-of-Service' and 'Quality-of-Design' to 'Quality-of-Experience': A Holistic View on Future Telecommunication Services*". Invited Talk, 10<sup>th</sup> COST 290 Meeting, Vienna, Austria, 01.10.2007.
19. "*Towards Future Communications: Convergent Architectures, Network Economics, and User Behaviour*". Invited Talk, IEEE ComSoc Croatia Chapter. Faculty of Electrical Engineering (FER), University of Zagreb, Croatia, 26.09.2007.
20. "*On the Evolution of Network Architecture Concepts and Communication Technologies with Regard to the Future Convergence between IT and Telecommunications including Related New Business Models and Future Behaviour of the End User – Perspectives and Research Contributions*". Guest Lecture, Department of Computer Science, University of Vienna, Telekom Austria H.Q., Vienna, 26.06.2007.
21. "*Towards Future Communications: User – Content – Interaction*". Invited Lecture, OCG Competence Circle, Vienna, Austria, 17.04.2007.
22. "*Towards Future Communications: Architectures, Economics, and User-Content-Interaction*". Invited Presentation, Arsenal Research, Vienna, Austria, 16.04.2007.
23. "*IMS Charging – a Key Step in Realizing Next Generation Networks*". Invited Talk, Dagstuhl Seminar 06132 "Internet Economics", Dagstuhl Castle, Germany, 31.03.2006.
24. "*Economic and User Aspects of Future Telecommunication Services*". Invited Lecture, Departamento de Ingeniería Telemática, Universidad Carlos III de Madrid, Leganés, Spain, 05.07.2005.
25. "*Perspectives in Internet Economics*". Invited Lecture, Department of Electrical Engineering and Information Technology, TUM University of Technology Munich, 09.07.2003.
26. "*Auction Mechanisms for Communications Network Resources*". Invited Lecture, Faculty of Computer Science, University of the Federal Armed Forces Munich, 18.06.2003.
27. "*A Brief History of Internet Economics*". Invited Lecture, Department of Computer Science, University of Munich, 14.01.2003.
28. "*New Aspects of Dynamic Tariff Modelling for Communication Networks*". Invited Lecture, Forum Telekommunikation Wien, 27.10.2000.
29. "*Dynamic Traffic and Tariff Modelling for Communication Networks*". Informatik Oberseminar Lecture, Department for Computer Science, RWTH Aachen, Germany, 16.12.1999.

## **Symposium, Conference and Workshop Presentations**

1. "*It's the Ecosystem, Stupid: Lessons from an Anti-Copernican Revolution of User-centric Service Quality in Telecommunications*". DeSE'13, Abu Dhabi, United Arab Emirates, 18.12.2013.
2. "*A Fixed Point Model for QoE-Based Charging*". ACM SIGCOMM FhMN Workshop, Hong Kong, China, 16.08.2013.

3. *"How Paradoxical is the "Paradox of Side Payments"?: Notes from a Network Interconnection Perspective"*. 11<sup>th</sup> International Conference on Wired/Wireless Internet Communications (WWIC'13), St. Petersburg, Russia, 06.06.2013.
4. *"On the Fixpoint Problem of QoE-based Charging"*. VALUETOOLS 2012, Cargèse, Corsica, France, 12.10.2012.
5. *"Economics of QoE"*. Position statement, Dagstuhl Seminar 12181 "Quality of Experience", Dagstuhl Castle, Germany, 02.05.2012.
6. *"WFL vs IQX: Towards the Fundamental Laws of QoE"*. 7<sup>th</sup> COST IS0605 MCM Meeting, INRIA Rennes, France, 10.05.2011.
7. *"Economics of Logarithmic Quality-of-Experience in Communication Networks"*. 9<sup>th</sup> Conference of Telecommunication, Media and Internet Techno-Economics, Ghent, Belgium, 09.06.2010.
8. *"Utility Functions, Quality-of-Experience and the Weber-Fechner Law"*. 4<sup>th</sup> COST IS0605 WG4 Meeting, University of Ljubljana, Slovenia, 21.05.2010.
9. *"The User Knows Best: A QoX-based View on \*oD"*. Position statement, Dagstuhl Seminar 09072 "Bandwidth on Demand", Dagstuhl Castle, Germany, 09.02.2009.
10. *"Timing Game Aspects of Conversational Interactivity"*. 2<sup>nd</sup> COST IS0605 MCM Meeting, University of Zurich, Switzerland, 25.09.2008.
11. *"From QoS to QoX: A Charging Perspective"*. 18<sup>th</sup> ITC Specialist Seminar on "Quality of Experience", Blekinge Institute of Technology, Karlskrona, Sweden, 29.05.2008.
12. *"The Well-Tempered Conversation: On Quality of Experience of Interactive VoIP and Multimedia"*. EuroFGI IA.7.6 Workshop on Socio-Economic Aspects of Future Generation Internet, Blekinge Institute of Technology, Karlskrona, Sweden, 28.05.2008.
13. *"From Charging for QoS to Charging for QoX"*. 1<sup>st</sup> COST IS0605 MCM Meeting, IPTS, Seville, Spain, 03.04.2008.
14. *"A Stimulus-Response Mechanism for Charging Enhanced Quality-of-User Experience in Next Generation All-IP Networks"*. XIII Conferencia Latino-Ibero-Americana de Investigación de Operaciones (CLAIO'06), Montevideo, Uruguay, November 2006.
15. *"Trunk Reservation Revisited: On Price-Driven Optimal Storage Allocation in a Ubiquitous Peer-to-Peer Network Federation"*. INFORMS Annual Meeting 2006, Pittsburgh, USA, November 2006.
16. *"How to Define Conversational Interactivity: A Game-Theoretic Approach and Its Application in Telecommunications"*. IEEE 2006 John Vincent Atanasoff International Symposium on Modern Computing, Sofia, Bulgaria, October 2006.
17. *"Equilibrium Market Prices for Multi-Period Auctions of Internet Resources"*. 12th GI/ITG Conference on Measuring, Modelling and Evaluation of Computer and Communication Systems (MMB) together with 3rd Polish-German Teletraffic Symposium (PGTS), Dresden, Germany, September 2004.
18. *"Multi-period Auctions for Network Resources"*. NETWORKS 2004, Vienna, Austria, June 2004.
19. *"Second-chance Auctions for Multimedia Session Pricing"*. MIPS 2003, Naples, Italy, Nov. 2003.
20. *"Auction-based Optimal Dimensioning of MPLS Tunnels"*. KiVS 2003 (Kommunikation in Verteilten Systemen), Leipzig, Germany, Feb. 2003.

21. *"Edge Pricing in Space and Time: Theoretical and Practical Aspects of the Cumulus Pricing Scheme"*. 17<sup>th</sup> International Teletraffic Congress ITC-17, Salvador da Bahia, Brazil, December 2001.
22. *"Retrospective Pricing Models for Internet Services: Solving the Flat Rate Dilemma »à la Flensburg«"* Conference on Messung, Modellierung und Bewertung MMB'01, Aachen, Germany, September 2001.
23. *"How to Overcome the Feasibility Problem for Tariffing Internet Services: The Cumulus Pricing Scheme"*. IEEE ICC 2001, Helsinki, Finland, June 2001.
24. *"Nil Nove Sub Sole: Why Internet Charging Schemes look like as they do"*. 4<sup>th</sup> Berlin Internet Economic Workshop IEW'2001, Berlin, Germany, May 2001.
25. *"Auction Models for Multiprovider Internet Connections"*. Conference on Messung, Modellierung und Bewertung MMB'99, Trier, Germany, Sept. 1999.
26. *"Approximated Price Functions for Dynamic Volume-Based Pricing of Multiclass Internet Traffic"*. MMB'99, Trier, Germany, Sept. 1999.
27. *"Kelly's Bound, RUAA and the Pricing of Multiclass Traffic in Loss Networks"*. 15<sup>th</sup> UK Performance Evaluation Workshop, Bristol, UK, July 1999.
28. *"A Generalized TES Model for Periodic Traffic"*. IEEE International Conference on Computer Communications ICC'98, Atlanta (GA), June 1998
29. *"Does the TES Stitching Function Merely Stitch?"*. IEEE IPCCC'98, Phoenix (AZ), Febr. 1998.
30. *"How to Model Complex Periodic Traffic with TES"*. 13<sup>th</sup> UK Performance Evaluation Workshop. Ilkley, UK, July 1997.
31. *"Including User Interest for QoS-based Service Selection in CORBA"*. Kommunikation in Verteilten Systemen KiVS'97. Braunschweig, Germany, February 1997.
32. *"How to Enhance Service Selection in Distributed Systems"*. International Conference on Distributed Computer Communication Networks DCCN'96. Tel Aviv, Israel, November 1996.
33. *"How to Place Connectionless Servers in ATM Networks"*. 4<sup>th</sup> IFIP Workshop on Performance Modelling and Evaluation of ATM Networks. Ilkley, UK, July 1996.

## Conference and Workshop Tutorials

1. *"On the Fixpoint Problem of QoE Charging"*. Journée thématique autour de l'utilisation de la théorie des jeux en Télécom. IRISA Rennes, France, 31.05.2012.
2. *"Economics of Quality of Service"*. Tutorial, Joint ETICS and EuroNF PhD Course "Economics and Technologies of Intercarrier Services", Télécom ParisTech, Paris, France, 20.10.2011.
3. *"From Charging for QoS to Charging for QoE: Internet Economics in the Era of Next Generation Multimedia Networks"*. Conference tutorial, International Conference on Autonomous Infrastructure, Management and Security (AIMS'07), Oslo, Norway, 21.06.2007.

4. "*User Models and Trials in Internet Economics*". U0 Tutorial on "Improving the User Experience". FTW Vienna, 22.01.2004.
5. "*Efficient Internet Pricing*". A0 Tutorial on "Hot Topics in Next Generation Internet Research", FTW Vienna, 17.06.2003.
6. "*The Mathematics of Congestion Pricing*". Tutorial "Mathematical Research at ftw.", FTW Vienna, July 2003.
7. "*Second-price Auctions in Communication Networks*". A2 Tutorial on "End-to-End Analysis and Provisioning of Heterogeneous Voice/Data Networks". TU Vienna, Institut für Kommunikationsnetze, 28.01.2003.
8. "*Internet Economics: Fundamentals and Applications*". A0 Tutorial on "Key Internet Technologies: Congestion Control, Routing, Network Economics". FTW Vienna, 19.03.2002.
9. "*Pricing Internet Services*". A0 Tutorial on "Quality-of-Service in the Internet: State of the Art". TU Wien, Institut für Kommunikationsnetze, 02.05.2001.

### **Further Presentations and Panel Discussions**

1. "*Between Shared Data Plans and Sponsored Content: Towards a Comprehensive Research Agenda for Smart Data Pricing (SDP)*". Round Table Chair, 8<sup>th</sup> International Workshop on Advanced Internet Charging and QoS Technology (ICQT'13), Zurich, Switzerland, 14.10.2013.
2. "*À la Recherche du Temps Perçu: The RBUCE WEST International Research Chair NICE*". Présentation, Mi Parcours Institut Carnot, Télécom Bretagne, Brest, 11.07.2013.
3. "*La Chaire Internationale NICE*". Présentation, Comité de la Recherche, IRISA / Télécom Bretagne, Cesson Sevigné, 20.03.2013.
4. "*A Brief History of Network Economics*". Invited presentation, Télécom Bretagne, Antenne de Toulouse, 28.01.2013.
5. "*Project AWARE: Aggregation of Wireless Access Resources*". Invited presentation at plenary meeting of CELTIC project HOMESNET, Université de Versailles St Quentin, France, 20.01.2012.
6. "*Research methods in human centric communications*". Teaching demonstration lecture, Faculty of Electronics, Communications and Automation, Aalto University, Helsinki, Finland, 14.10.2010.
7. "*Information in abundance – could it be a bit less?*" Panel discussion participant, OCG Week of Computer Science, ICT Research Centres Day. Media Tower, Vienna, Austria, 20.09.2007.
8. "*Second Price Second Chance, or: How to Secure a Lost Tunnel*". A2 Day, FTW Vienna, 07.10.2003.
9. "*New Projects and International Activities*". Future Telecommunications Workshop, Wiener Telekom-Tag'01, FTW Vienna, 15.11.2001.

# Teaching and Supervision

## Lecture Courses and Seminars

Spring term 2014: “*Technische Grundlagen und Systemsoftware (TGS)*”, VO (Bachelor, StEOP), University of Vienna (together with Andreas Janecek).

Spring term 2014: “*Cooperative Systems*”, VU 050052 (Master), University of Vienna (together with Gerald Quirchmayr).

Winter term 2013: “*Technische Grundlagen und Systemsoftware (TGS)*”, VO (Bachelor, StEOP), University of Vienna (together with Andreas Janecek).

Spring term 2013: “*Cooperative Systems*”, VU 050052 (Master), University of Vienna (together with Gerald Quirchmayr).

Spring term 2012: “*Pilots in Mobile Interaction: User-centered Interaction Research and Evaluation*”, VU183.577, Vienna University of Technology (together with members of FTW’s Area U and INSO).

Winter term 2011/12: “*Fundamentals of Telecommunication Economics*”, VO442.113, Technical University Graz.

Spring term 2011: “*Pilots in Mobile Interaction: User-centered Interaction Research and Evaluation*”, VU183.577, Vienna University of Technology (together with members of FTW’s Area U and INSO).

Spring term 2011: “*Fundamentals of Telecommunication Economics*”, VO442.113, Technical University Graz.

Spring term 2011: “*Application Prototyping*”. Seminar, Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna

Winter term 2010/11: “*Advanced Systems Architectures*” and “*Applied Internet Economics*”. Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Spring term 2010: “*Application Prototyping*”. Seminar, Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Winter term 2009/10: “*Fundamentals of Telecommunication Economics*”, VO442.113, Technical University Graz.

Winter term 2009/10: “*Advanced Systems Architectures*” and “*Applied Internet Economics*”. Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Spring term 2009: “*Application Prototyping*”. Seminar, Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Winter term 2008/09: “*Fundamentals of Telecommunication Economics*”, VO442.113, Technical University Graz.



Winter term 2008/09: “*Advanced Systems Architectures*”. Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Winter term 2008/09: “*Applied Internet Economics*”. Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Spring term 2008: “*Application Prototyping*”. Seminar, Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Winter term 2007/08: “*Fundamentals of Telecommunication Economics*”, VO442.113, Technical University Graz.

Winter term 2007/08: “*Advanced Systems Architectures*” and “*Applied Internet Economics*”, and Seminar “*Introduction to Scientific Research*”. Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Spring term 2007: “*Advanced Systems Architectures*” and Seminar “*Application Prototyping*”, Master’s program “Telecommunications and Internet Technologies”, University of Applied Sciences Technikum Vienna.

Winter term 2006/07: “*Fundamentals of Telecommunication Economics*”, VO442.112, Technical University Graz.

Spring term 1997: “*Performance Evaluation of Computer Networks*”, lecture series complementing the lecture course “*Systemprogrammierung*” (Otto Spaniol), Lehrstuhl Informatik 4, RWTH Aachen.

Winter term 1996/97: “*Verteilte Systeme*” [Distributed Systems], together with Claudia Linnhoff-Popien. Universität-GH Essen.

Winter term 1996/97: „*Netzmanagement*“ [Network Management], together with Claudia Linnhoff-Popien. Universität-GH Essen.

## Classes

Spring term 2014: “*Technische Grundlagen und Systemsoftware (TGS)*”, UE (Bachelor, StEOP), University of Vienna (together with Andreas Janecek).

Winter term 2001/02: Seminar „*Internet Economics 3*“ (Prof. Stiller). TIK, ETH Zurich.

Spring term 2001: Seminar „*Internet Economics 2*“ (Prof. Stiller). TIK, ETH Zurich.

Winter term 2000/01: Seminar „*Internet Economics 1*“ (Prof. Stiller). TIK, ETH Zurich

Spring term 2000: Lecture „*Technical Informatics II*“ (Prof. Plattner): lecture assistance, TIK, ETH Zurich.

Spring term 1998: Lecture “*Local Networks [Lokale Netze]*” (Prof. Spaniol): lecture assistance, Lehrstuhl Informatik 4, RWTH Aachen.

Spring term 1998: Seminar “*Distributed Systems [Verteilte Systeme]*“ (Dr. Linnhoff-Popien): seminar assistance.

Winter term 1997/98: Seminar “*Data Communications*” (Prof. Spaniol): student supervision. Lehrstuhl Informatik 4, RWTH Aachen.

Winter term 1997/98: Lecture “*Operating Systems* [Systemprogrammierung]” (Prof. Spaniol): lecture assistance and student’s exercises supervision. Lehrstuhl Informatik 4, RWTH Aachen.

Spring term 1997: Lecture “*Computer Organization* [Rechnerstrukturen] (Prof. Haverkort): lecture assistance and students’ exercises supervision, Lehr- und Forschungseinheit “Verteilte Systeme”, RWTH Aachen.

Spring term 1997: Seminar “*Distributed Systems* [Verteilte Systeme]“ (Dr. Linnhoff-Popien): seminar assistance.

Spring term 1996: Lecture “*Network Management* [Netzmanagement]“ (Prof. Spaniol, Dr. Linnhoff-Popien): Students’ exercises, Lehrstuhl Informatik 4, RTWH Aachen.

Spring term 1996: Seminar “*Distributed Systems* [Verteilte Systeme]“ (Dr. Linnhoff-Popien): seminar assistance.

Winter term 1995/96: Lecture “*Operating Systems* [Systemprogrammierung]” (Prof. Spaniol): lecture assistance and students’ exercises supervision, Lehrstuhl Informatik 4, RWTH Aachen.

## **PhD Candidates (currently running theses)**

1. Sebastian Egger, FTW/Graz University of Technology: *QoE Modeling for Interactive Internet Applications in the Presence of Delay*. Joint supervision with Prof. Gernot Kubin, TU Graz, and Prof. Sebastian Möller, TU Berlin.
2. Joachim Zeiss, Vienna University of Technology: *Semantic Collaboration of Mobile Web Applications Based on Low Complexity User Declarations*. Joint supervision with Prof. Jürgen Dorn, Vienna University of Technology.
3. Patrick Zwickl, FTW/ University of Vienna: *Strategies for Balancing and Charging Interconnection Service Quality*.
4. Thomas Turek, Vienna University of Technology: *Secure VoIP Communication Based on SOA Paradigm*. Joint supervision with Prof. Dietmar Dietrich, TU Vienna.
5. Andreas Sackl, FTW/ University of Vienna: *User Aspects in QoE: The Influence of Expectations, User Choices and Charging on Perceived Quality*.
6. Stephan Wirsing, University of Vienna: *Economic Efficiency of a Platform-based Pluralistic Spectrum Licensing Regime in a Competitive Multi-Operator, Multi-Service Environment*. Joint supervision with Prof. Heikki Hämmäinen, Aalto University Helsinki, Finland.

## **PhD Alumni**

1. Christoph Egger, Vienna University of Technology: *Improvement Strategies for the Signaling Performance of the Session Initiation Protocol*. TU Vienna, July 2012 (joint supervision with Prof. Harmen van As, TU Vienna).

2. Marco Happenhofer, Vienna University of Technology: *Transaction-based Signaling Performance in Next Generation Networks*. TU Vienna, March 2011 (joint supervision with Prof. Harmen van As, TU Vienna).
3. Matthias Baldauf, FTW: *Advanced Interaction and Visualization Concepts for Mobile Urban Exploration*. Vienna, January 2011 (joint supervision with Prof. Thomas Grechenig, TU Vienna).
4. Thomas Rausch, Vienna University of Technology: *Prohibitive Alternative Routing in Air Traffic Services Networks*. TU Vienna, December 2008 (joint supervision with Prof. Dietmar Dietrich, TU Vienna, and Prof. Dominique Barth, University of Versailles).
5. Ivan Gojmerac, FTW: *Adaptive Multipath Routing*. TU Vienna, April 2007 (joint supervision with Prof. Dietmar Dietrich, TU Vienna, and Prof. Ralf Lehnert, TU Dresden)  
Award: This thesis has been awarded the “GIT Dissertation Prize 2007” of the Österreichischer Verband für Elektrotechnik (OVE).
6. Florian Hammer, FTW: *Quality Aspects of Packet-Based Interactive Speech Communication*. TU Graz, Austria, July 2006 (FTW supervisor).

## Habilitation Committees and PhD Juries

1. Florian Metzger, University of Vienna, Austria. PhD thesis: *Modern Media Streaming and its Transport in Mobile Networks*. Evaluator, Vienna, Spring 2014.
2. Mariem Krichen, Laboratoire PRiSM, Université de Versailles St Quentin: *Modèle technico-économique pour le déploiement d'un réseau femto avec partage de ressources*. Examineur, Versailles, February 2014.
3. Andreas Berger, FTW/University of Vienna, Austria. PhD thesis: *Analysis of Collaboration and Agility in Internet Traffic for Malware Detection*. Evaluator, Vienna, November 2013.
4. Xavier Misseri, Télécom ParisTech/EDITE, France. PhD thesis: *Vers une utilisation de la diversité de chemin dans l'Internet (Enabling Inter-domain Path Diversity)*. Rapporteur, Paris, October 2013.
5. María Isabel Amigo, Télécom Bretagne/MATISSE, France. PhD thesis: *Technological and Economic Aspects for Quality of Service in Multidomain Alliances*. Rapporteur, Brest, July 2013.
6. Tomislav Grgic, University of Zagreb, PhD Thesis: *Online Charging for Services in Communication Network based on User-related Context*. Evaluator, Zagreb, April 2013.
7. Khalil Laghari, Télécom SudParis. PhD thesis: *QoE based Modeling, Analysis and Evaluation of Multimedia Services*. Rapporteur, Paris, April 2012.
8. Sivasothy Shanmugaligam, Télécom SudParis. PhD thesis: *Convergence of Web and Communication Services*. Examineur, Paris, April 2012.

9. Timo Koskela, University of Oulu. PhD thesis: *Community-centric mobile peer-to-peer services: evaluation of performance and user experience (Yhteisölliset mobiilit vertaisverkkopalvelut: suorituskyvyn ja käyttäjäkokemuksen arvioninti)*. Evaluator, Oulu, November 2011.
10. Jean-Louis Rougier, Université Pierre et Marie Curie (Paris 6). HDR thesis: *Routing and Traffic Engineering in Networks*. Rapporteur, Paris, December 2010.
11. Federico Larroca Ponzoni, Télécom ParisTech, Paris, France. PhD thesis: *Dynamic Traffic Engineering Techniques for the Internet*. Rapporteur, Paris, December 2009.
12. Guillaume Erbs, France Telecom R&D and Université LIP6, Paris, France. PhD thesis: *Optimisation du revenu, tarification, et allocation de ressources dans les réseaux de télécommunications en contexte concurrentiel (Revenue Optimization, Tariffication and Resource Allocation in Telecommunications Networks in the Context of Competition)*. Rapporteur, Paris, February 2007.
13. Martín Varela Rico, IRISA, Rennes, France. PhD thesis: *Évaluation Pseudo-Subjective de la Qualité d'un Flux Multimédia et ses Applications au Contrôle (Pseudo-subjective Quality Assessment of Multimedia Streams and its Applications in Control)*. Rapporteur, Rennes, November 2005.
14. Loubna Echabbi, PRiSM, Université de Versailles, France. PhD thesis: *Algorithmique pour l'allocation et la tarification des ressources dans les réseaux télécoms avec garanties de service (Algorithmics for allocation and tariffing of telecom network resources with QoS guarantees)*. Rapporteur, Versailles, September 2005.
15. Patrick Maillé, ENST Bretagne, Rennes, France. PhD thesis: *Applications de la théorie des jeux à la tarification de l'Internet (Applications of Game Theory to Internet Tariffing)*. Rapporteur, Rennes, June 2005.

## Diploma / Master Students

1. Christian Dengler. *Real-time Speech Transmission for Multimedia Services*. Master thesis, FH Technikum, Vienna, 2014.
2. Stefan Wahlmüller. *Pricing and Regulating Quality of Experience*. Master thesis, TU Graz, 2012.
3. Francesco Petrone. *SNAP: a full mesh protocol for Wireless Sensor Networks*. Master thesis, FH Technikum Vienna, 2011.
4. Roland Malik. *A Strategy-based Assistant for Traffic Jam Avoidance*. Master thesis, FH Technikum Vienna, 2011.
5. Christian Jaros. *Specification, Evaluation and Implementation Aspects of an Open Video-on-Demand Architecture*. Master thesis, FH Technikum Vienna, 2010.
6. David Hamann. *Development and Implementation of a Proof-of-Concept System for an Open Video-on-Demand Solution*. Master thesis, FH Technikum Vienna, 2010.
7. Matthias Fuchs. *Android Realtime Barcode Reader*. Master thesis, FH Technikum Vienna, 2010.

8. Simeona Pellkvist: *Semantic Technologies for SIP Messages and Mobile Services*. Master thesis, FH Technikum Vienna, 2010.
9. Peter Wölflingseder: *Implementierung und Evaluation eines Rich Client für mobile Wettanwendungen*. Master thesis, FH Technikum Vienna, 2009.
10. Ronny Fischer: *Transport layer and state machine for a platform independent IMS stack: architecture and implementation*. Master thesis, FH Technikum Vienna, 2009.
11. Richard Huber: *Design und Implementierung einer Sound Bibliothek für einen plattformunabhängigen IMS Stack*. Master thesis, FH Technikum Vienna, 2009.
12. Christoph Hecht: *Design and Evaluation of an Intrusion Detection System for IMS*. Master thesis, FH Technikum Vienna, 2009.
13. Gerhard Obernberger: *Design, Implementierung und Evaluation von mobilen Benutzerschnittstellen für den Zugang zu räumlicher Information*. Diploma thesis, Vienna University of Technology, 2008.
14. Raphael Seywerth: *MASSAI – Mobile Applications based on Social Smart Identities*. Master thesis, FH Technikum Vienna, February 2008.
15. Thomas Jirku: *Prognostic Capacity Management from an IT Service Management Perspective*. Master thesis, FH Technikum Vienna, 2008.
16. Sebastian Egger: *Benutzerzufriedenheitsmessung von mobilen audio-visuellen Kommunikationsmedien*. Diploma thesis, Graz University of Technology, 2008.
17. Elena Recas de Buen: *Perceived Video Interactivity in Video Conference Services*. Diploma thesis, Vienna University of Technology, 2007.
18. Petr Kotik: *Availability Analysis of an IP Multimedia Subsystem Core*. Diploma thesis, Vienna University of Technology, 2007.
19. Andreas Brauneis: *Point and Speak*. Diploma thesis, Vienna University of Technology, 2006.
20. Bernhard Weitlaner: *Evaluation of VoIP Speech Quality in WLANs*. Diploma thesis, FH Salzburg, 2005.
21. Stefan Domenig: *Speech quality of VoIP in 802.11g Networks*. Diploma thesis, FH Salzburg, May 2004.
22. Stefan Wrzaczek: *Auction Mechanisms for Communications Networks*. Diploma thesis, TU Vienna, December 2003.
23. Marcel Lötscher: *Simulative Performance Evaluation for TCP over UMTS*. Diploma thesis, TIK, ETH Zurich, March 2003.
24. Andy van Maele: *A Flexible Framework for Pricing IP Services*. Master thesis, TIK, ETH Zurich, and University of Ghent, Belgium, April 2001.
25. Pascal Kurtansky: *Kostenmodelle für Internet Service Provider [Cost Models for Internet Service Providers]*. Diploma thesis, TIK, ETH Zurich, 2000.
26. Beat Spielmann: *Design and Evaluation of Efficient Pricing Schemes for Integrated Internet Services*. Diploma thesis, TIK, ETH Zurich, July 1999.
27. Frank Mohren: *Verkehrsmodellierung mit TES (Transform-Expand-Sample) [Traffic Modelling with TES (Transform-Expand-Sample)]*. Diploma thesis, Lehrstuhl für Informatik 4, RWTH Aachen, Febr. 1999.

28. Tatjana Trajkovska: *Modellierung von zyklischem und selbstähnlichem Netzverkehr mit Hilfe von autoregressiven Prozessen* [Modelling Cyclic and Self-similar Network Traffic using Autoregressive Processes]. Diploma thesis, Lehrstuhl Informatik 4, RWTH Aachen, 1998.
29. Margarete Dochniak: *Statistische Analyse von Leistungsmessungen in GSM-Netzen* [Statistical Analysis of Performance Measurements in GSM Networks]. Diploma thesis, RWTH Aachen, Lehrstuhl Informatik 4, 1997.
30. Monika Effer-Hack: *Verkehrsmodellierung für GSM-Netze mit stochastischen Petrinetzen* [Traffic Modelling for GSM Networks using Stochastic Petri Networks]. Diploma thesis, RWTH Aachen, Lehrstuhl Informatik 4, 1997.

## Thesis Defense Committees

1. Alexander Franiak, University of Vienna, Austria. Master thesis: *Cloud Gaming – technische Machbarkeit und Auswirkungen von Streaming moderner Computerspiele auf das Benutzererlebnis*. Vienna, November 2013.

## Supervision of Seminar Theses

1. Mar González, Cécilia Lepage: *Using game-theory to analyse user cooperation in satellite resource management*. Télécom Bretagne, Antenne de Toulouse, April 2013.
2. Karl Maier: *Regulatory Aspects of Radio Spectrum Access for CR/SDR Technologies*. TU Graz, February 2013.
3. Francesco Petrone: *Programming the SNAP environment*. Seminar “Application Prototyping”, FH Technikum Vienna, August 2010.
4. Christian Dengler: *Weiterentwicklung FTW SIP Stack*. Seminar “Application Prototyping”, FH Technikum Vienna, August 2010.
5. Christian Jaros: *Specification, Evaluation and Implementation Aspects of an Open Video-on-Demand Architecture*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2009.
6. David Hamann: *Development and Implementation of a Proof-of-Concept System for an Open Video-on-Demand Solution*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2009.
7. Matthias Fuchs: *Android Realtime Barcode Reader*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2009.
8. Simeona Pellkvist: *Semantic Technologies for SIP Messages and Mobile Services*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2009.
9. Anthony Ekeh Itodo: *Capacity Evaluation of Wireless Mesh Networks*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2009.
10. Roland Malik: *A Strategy-Based Assistant for Traffic Jam Avoidance*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2009.
11. Peter Wölflingseder: *Implementierung eines Rich Client für mobile Wettanwendungen*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2008.

12. Markus Dudek: *Gesture recognition – Concepts and Experiences*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2008.
13. Ronny Fischer: *Towards a platform independent IMS stack*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2008.
14. Richard Huber: *Design einer Sound Bibliothek für einen plattformunabhängigen IMS Stack*. Master Seminar “Application Prototyping”, FH Technikum Vienna, July 2008.
15. Christoph Hecht: *IMS Security*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2008.
16. Thomas Mayerdorfer, Raphael Seywerth: *Mobile Applications based on Social Smart Identities*. Seminar “Application Prototyping”, FH Technikum Vienna, July 2007.
17. Thomas Wondra: *Messaging in IMS*. Seminar “Application Prototyping”, FH Technikum Vienna, August 2007.
18. Thomas Jirku: *Capacity Management in ITIL*. Seminar “Application Prototyping”, FH Technikum Vienna, Aug. 2007.
19. J.-D. Merkli: *Paris Metro Pricing*. Seminar “Internet Economics 3”, TIK, ETH Zurich, 2002.
20. S. Markwalder: *Auctions in the Internet*. Seminar “Internet Economics 2”, TIK, ETH Zurich, 2001.
21. G. Oberholzer, D. Schrag: *Basic Effects and Consequences of Internet Economics*. Seminar “Internet Economics 1”, TIK, ETH Zurich, 2001.
22. M. Heimbeck, C. Roserens: *User Reactions on Prices*. Seminar “Internet Economics 1”, TIK, ETH Zurich, 2000.
23. I. Assent: *Computer Power and Human Reason* [Die Macht der Computer und die Ohnmacht der Vernunft]. Seminar „Data Communications“, Lehrstuhl Informatik 4, RWTH Aachen, 1998.

## Further Professional Activities

### Journal Board and Guest Editorial Activities

- 2014 *Advances in Quality of Experience*. Special issue of PIK (Praxis der Informationsverarbeitung und Kommunikation), Autumn 2014.
- 2011 *Socio-economic Issues of Next Generation Networks*. Special issue of Telecommunication Systems Journal, Volume 52, Issue 2. Springer, February 2013.
- 2008 – 2014 Member of the Editorial Board of the “Journal of Theoretical and Applied E-Commerce Research” (JTAER)
- since 2003 Member of the Scientific Board of “Praxis der Informationsverarbeitung und Kommunikation” (PIK)
- 2005 Supporting guest editor for special issue of Journal of Computer Communications, Elsevier, 2005.
- 2004 *Internet Economics - Pricing and Policies*. Special issue of Journal of Computer Networks. Elsevier, September 2004.
- 2004 *Internet Pricing and Charging - Algorithms, Technology and Applications*. Special issue of Journal of Computer Communications. Elsevier, April 2004.
- 2002 *Forschung im Zentrum*. Themenheft 04/2002 of „Praxis der Informationsverarbeitung und Kommunikation“ (PIK). K. Saur Verlag, München, Dez. 2002.

### Conference/Workshop Organization and Chairing

- 2014 Global Outreach Committee Member of the 1<sup>st</sup> IEEE International Symposium on Ethics in Engineering, Science, and Technology (ETHICS'2014), Chicago, U.S.A., May 2014.
- 2013 General Chair of the 8<sup>th</sup> International Workshop on “Internet Charging and QoS Technology” ICQT'13, Zurich, Switzerland, September 2013.
- 2013 Publicity Co-chair of the 5<sup>th</sup> International Workshop on Quality of Multimedia Experience (QoMEX 2013), Klagenfurt, Austria, July 2013.
- 2012 Organizer and co-chair of the International Dagstuhl Seminar 12181 “Quality of Experience: From User Perception to Instrumental Metrics”, with around 30 world-class researchers participating. Schloss Dagstuhl, Germany, May 2012.
- 2011 Steering Committee Member of the 7<sup>th</sup> International Workshop on “Internet Charging and QoS Technology” ICQT'11, Paris, France, October 2011.



- 2011 Organizer of the *Final Workshop* of the SISCom International Research Chair “Future Telecommunication Ecosystems”, Rennes, France, September 2011.
- 2009 Co-Chair of the 6<sup>th</sup> *International Workshop on “Internet Charging and QoS Technology” ICQT’09*, Aachen, Germany, May 2009.
- 2009 Organizer and co-chair of the *International Dagstuhl Seminar 09192* “From Quality-of-Service to Quality-of-Experience”, comprising 30 world-class researchers in the area. Schloss Dagstuhl, Germany, May 2009.
- 2007 Member of the Program and Organization Committee for the “Vermittlungs-technisches Kolloquium” of Vienna University of Technology, Vienna, June 2006.
- 2006 TPC Co-Chair of 5<sup>th</sup> *International Workshop on “Internet Charging and QoS Technology” ICQT’06*, associated with ACM SIGMETRICS/IFIP Performance 2006, St. Malo, France, June 2006.
- 2006 Member of the Program and Organization Committee for the “Vermittlungs-technisches Kolloquium” of Vienna University of Technology, Siemens Forum, Vienna, June 2006.
- 2006 Co-organization of the third workshop on “New Paradigms in Interaction Design”, 08.06.2006, FTW, Vienna, Austria.
- 2006 Co-chair/organizer of an *International Dagstuhl Seminar on “Internet Economics”*, comprising around 20 world-class researchers in the area, Schloss Dagstuhl, Germany, March 2006.
- 2005 Co-organization of the workshop series “New Paradigms in Interaction Design” with two events: 10.06.2005 & 07.11.2005, FTW, Vienna, Austria.
- 2004 Co-Chair/organizer of the 4th *International Workshop on “Internet Charging and QoS Technology” ICQT’04*, colocated with QoFIS’04, Barcelona, October 2004
- 2003 Co-Chair/organizer of the 3rd *International Workshop on “Internet Charging and QoS Technology” ICQT’03*, colocated with NGC’03, Munich, September 2003
- 2003 Co-Chair/organizer of an *International Dagstuhl Seminar on “Internet Economics”*, comprising 30 world-class researchers in the area, Schloss Dagstuhl, Germany, August 2003
- 2002 Co-Chair/organizer of the 2nd *International Workshop on “Internet Charging and QoS Technology” ICQT’02*, colocated with QoFIS’02, Zurich, October 2002
- 2001 Co-Chair/organizer of the *International Workshop on “Advanced Internet Charging and QoS Technology” ICQT’01*, Vienna, September 2001

## TPC Memberships

- 2014 *IEEE GLOBECOM 2014 – Communications QoS, Reliability, and Modeling Symposium*, Austin, TX, USA, December 2014.
- 2014 *AyurInfo 2014 – 1<sup>st</sup> Workshop on Recent Developments in Ayur-Informatics*, affiliated with 3rd International Conference on Advances in Computing, Communications and Informatics (ICACCI-2014), Delhi, India, September 2014.
- 2014 *20<sup>th</sup> EUNICE Workshop on Advances in Communication Networking*, Rennes, France, September 2014.
- 2014 *IEEE International Conference on Communications (ICC 2014) – Communications QoS, Reliability and Modelling Symposium*, Sidney, Australia, June 2014.
- 2014 *12<sup>th</sup> Annual International IEEE Conference on Modelling and Optimization in Mobile, Ad hoc and Wireless Networks (WiOpt 2014)*, Hammamet, Tunisia, May 2014.
- 2014 *17<sup>th</sup> International Conference on “Measurement, Modelling and Evaluation of Computing and Communication Systems” and “Dependability and Fault Tolerance” (MMB&DFT’14)*, Bamberg, Germany, March 2014.
- 2013 *IEEE GLOBECOM 2013 – Communications QoS, Reliability, and Modeling Symposium*, Atlanta, GA, USA, December 2013.
- 2013 *ACM/IEEE/IFAC/TRB International Conference on Connected Vehicles (ICCVE’13)*, Las Vegas, U.S.A., December 2013.
- 2013 *15<sup>th</sup> IEEE International Conference on e-Health Networking, Applications and Services (HEALTHCOM 2013)*, Lisbon, Portugal, October 2013.
- 2013 *10<sup>th</sup> International Workshop on Grid Economics and Business Models (Gecon’13)*, Zaragoza, Spain, September 2013
- 2013 *7<sup>th</sup> MMBnet Workshop*, Hamburg, Germany, September 2013.
- 2013 *18<sup>th</sup> IEEE International Workshop on Computer Aided Modeling Analysis and Design of Communication Links and Networks (CAMAD 2013)*, Berlin, Germany, Sept. 2013.
- 2013 *IEEE International Conference on Communications (ICC 2013)*, Communications QoS, Reliability and Modelling Symposium, Budapest, Hungary, June 2013.
- 2013 *5<sup>th</sup> International Workshop on Quality of Multimedia Experience (QoMEX 2013)*, Klagenfurt, Austria, July 2013.
- 2013 *11<sup>th</sup> Annual International IEEE Conference on Modelling and Optimization in Mobile, Ad hoc and Wireless Networks (WiOpt 2013)*, Tsukuba Science City, Japan, May 2013.
- 2012 *ACM/IEEE/IFAC/TRB International Conference on Connected Vehicles (ICCVE 2012)*, Beijing, China, December 2012.

- 2012 *9<sup>th</sup> International Workshop on Grid Economics and Business Models (Gecon'12)*, Berlin, Germany, November 2012
- 2012 *17<sup>th</sup> IEEE International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD 2012)*, Barcelona, Spain, September 2012.
- 2012 *4<sup>th</sup> International Workshop on Quality of Multimedia Experience (QoMEX 2012)*, Yarra Valley, Australia, July 2012.
- 2012 *IEEE International Conference on Communications (ICC 2012)*, Communications QoS, Reliability and Modelling Symposium, Ottawa, Canada, June 2012.
- 2012 *Workshop on "Pricing and Incentives in Networks" (W-PIN 2012) @ ACM SIGMETRICS /Performance 2012*, London, UK, June 2012.
- 2012 *20<sup>th</sup> IEEE International Workshop on Quality of Service (IWQoS 2012)*, Coimbra, Portugal, June 2012.
- 2012 *8<sup>th</sup> EuroNF Conference on Next Generation Internet (NGI 2012)*, Karlskrona, Sweden, June 2012.
- 2012 *10<sup>th</sup> Annual International IEEE Conference on Modelling and Optimization in Mobile, Ad hoc and Wireless Networks (WiOpt 2012)*, Paderborn, Germany, May 2012.
- 2012 *11<sup>th</sup> IFIP/TC6 NETWORKING 2012*, Prague, Czech Republic, May 2012.
- 2012 *16<sup>th</sup> International Conference on "Measurement, Modelling and Evaluation of Computing and Communication Systems" and "Dependability and Fault Tolerance" (MMB&DFT'12)*, Kaiserslautern, Germany, March 2012.
- 2011 *IEEE GLOBECOM 2011 - Communications QoS, Reliability, and Modeling Symposium*, Houston, TX, USA, December 2011
- 2011 *ITU-T Kaleidoscope 2011 "The fully networked human? – Innovations for future networks and services"*, South Africa, Dec 2011
- 2011 *8th International Workshop on Grid Economics and Business Models (Gecon'11)*, Paphos, Cypros, December 2011
- 2011 *6<sup>th</sup> MMBnet Workshop*, Hamburg, Germany, September 2011
- 2011 *IEEE International Conference on Communications (ICC 2011)*, Communications QoS, Reliability and Modelling Symposium, Kyoto, Japan, June 2011
- 2011 *7<sup>th</sup> EuroNF Conference on Next Generation Internet (NGI 2011)*, Kaiserslautern, Germany, June 2011
- 2011 *International Workshop on Smart Mobile Applications (SmartApps'11) in conjunction with PERVASIVE 2011*, San Francisco, USA, June 2011
- 2011 *9<sup>th</sup> Annual International IEEE Conference on Modelling and Optimization in Mobile, Ad hoc and Wireless Networks (WiOpt 2011)*, Princeton, U.S.A, May 2011.
- 2011 *10<sup>th</sup> IFIP/TC6 NETWORKING 2011*, Valencia, Spain, May 2011

- 2011 *1<sup>st</sup> International Workshop on Managing Federations & Cooperative Management (ManFed.Com)*, in conjunction with IEEE IM 2011, Dublin, Ireland, May 2011.
- 2010 *Workshop on Performance Evaluation of Computer and Communication Systems: Milestones and Future Challenges (PERFORM'10)*, Vienna, October 2010
- 2010 *3rd Workshop on Economic Traffic Management (ETM 2010)*, co-located with ITC-22, Amsterdam, The Netherlands, September 2010
- 2010 *2<sup>nd</sup> International Conference on Evolving Internet (INTERNET 2010)*, Valencia, Spain, September 2010
- 2010 *7th International Workshop on Grid Economics and Business Models (Gecon'10)*, Ischia, Italy, August 2010
- 2010 *5<sup>th</sup> IASTED International Conference on Human-Computer Interaction (IASTED-HCI 2010)*, Lahaina, U.S.A., August 2010
- 2010 *International Workshop on Mobile and Location-based Business Applications (MAPPS'10)* in conjunction with MOBILWARE 2010, Chicago, U.S.A., June/July 2010.
- 2010 *6<sup>th</sup> EuroNF Conference on Next Generation Internet (NGI 2010)*, Paris, France, June 2010
- 2010 *9<sup>th</sup> RoEduNet IEEE International Conference*, Sibiu, Romania, June 2010.
- 2010 *8<sup>th</sup> Annual International IEEE Conference on Modelling and Optimization in Mobile, Ad hoc and Wireless Networks (WiOpt 2010)*, Avignon, France, May/June 2010.
- 2010 *IEEE International Conference on Communications (ICC 2010)*, Communications QoS, Reliability and Modelling Symposium, Cape Town, South Africa, May 2010.
- 2010 *3rd IEEE International Workshop on Bandwidth on Demand (BoD 2010)*, in conjunction with IEEE/ IFIP NOMS 2010, Osaka, Japan, April 2010.
- 2010 *IADIS International Conference e-society 2010*, Porto, Portugal, March 2010.
- 2010 *15<sup>th</sup> International Conference on "Measurement, Modelling and Evaluation of Computing and Communication Systems" and "Dependable Computing" (MMB&DC'10)*, Essen, Germany, March 2010.
- 2009 *1<sup>st</sup> Workshop on Broadband Wireless Network Communications Performance (BWNCP 2009)*, colocated with 28th IEEE IPCCC'09, Hawaii, U.S.A., December 2009.
- 2009 *IEEE GLOBECOM 2009*, Communications Quality of Service, Reliability and Performance Modeling Symposium, Honolulu, Hawaii, November 2009.
- 2009 *4<sup>th</sup> IASTED International Conference on Human-Computer Interaction (IASTED-HCI'09)*. St. Thomas, US Virgin Islands, Nov. 2009.

- 2009 *21<sup>st</sup> International Teletraffic Congress (ITC-21)*, Paris, France, September 2009.
- 2009 *Workshop on Services, Platforms, Innovations and Research for new Infrastructures in Telecommunications (SPIRIT 2009)*, Lübeck, Germany, September 2009.
- 2009 *6th International Workshop on Grid Economics and Business Models (Gecon'09)*, Delft, The Netherlands, August 2009
- 2009 *IEEE International Conference on Communications (ICC 2009)*, QoS and Modelling Symposium, Dresden, Germany, June 2009.
- 2009 *8th IFIP NETWORKING '09*, Aachen, Germany, May 2009.
- 2009 *"Kommunikation in Verteilten Systemen (Communication in Distributed Systems)" KiVS'09*, Kassel, Germany, March 2009.
- 2008 *5th International Workshop on Grid Economics and Business Models (Gecon'08)*, Las Palmas, Gran Canaria, Spain, August 2008
- 2008 *International Conference on Telecommunications and Multimedia (TEMU'08)*, Ierapetra, Crete, Greece, July 2008
- 2008 *7<sup>th</sup> IFIP International Conference on Networking (NETWORKING'08)*, Singapore, May 2008.
- 2008 *2nd IEEE International Workshop on Bandwidth on Demand (BoD'08)*, in conjunction with IEEE/ IFIP NOMS'08, Salvador da Bahia, Brazil, April 2008.
- 2008 *"Messung, Modellierung und Bewertung" (MMB'08)*, Dortmund, Germany, April 2008.
- 2008 *IADIS International Conference e-society 2008*.
- 2008 *3<sup>rd</sup> IASTED International Conference on Human-Computer Interaction (IASTED-HCI'08)*, Innsbruck, Austria, March 2008.
- 2007 *IADIS Multiconference on Computer Science and Information Systems (MCCSIS'07)*, Lisbon, Portugal, July 2007.
- 2007 *4th International Workshop on Grid Economics and Business Models (Gecon'07)*, Rennes, France, August 2007
- 2007 *EuroFGI NETCOOP 2007*, Avignon, France, June 2007.
- 2007 *"Kommunikation in Verteilten Systemen (Communication in Distributed Systems)" KiVS'07*, Berne, Switzerland, Febr. 2007.
- 2007 *International Conference on Wireless Information Networks and Systems WINSYS'07*, Barcelona, Spain, May 2007.
- 2007 *IADIS International Conference e-society 2007*.

- 2006 *IEEE International Symposium on Signal Processing and Information Technology (ISSPIT'06)*
- 2006 *International Conference on Wireless Information Systems WINSYS'06*
- 2006 *5<sup>th</sup> IFIP-TC6 Conference NETWORKING'06*, Coimbra, Portugal, May 2006.
- 2006 *TEMU'06 (International Conference on Telecommunications and Multimedia)*, Heraklion, Crete, Greece, July 2006.
- 2006 *5<sup>th</sup> RoEduNet IEEE International Conference*, Sibiu, Romania, June 2006.
- 2006 *IADIS International Conference e-society 2006*.
- 2005 *5<sup>th</sup> IEEE International Symposium on Signal Processing and Information Technology (ISSPIT'05)*
- 2005 *International Conference on E-Business and Telecommunication Networks (ICETE 2005)*, Reading, U.K., October 2005.
- 2005 *IADIS International Conference e-society 2005*.
- 2004 *29th Annual IEEE Conference on Local Computer Networks (LCN 2004)*
- 2004 *International Conference on E-Business and Telecommunication Networks (ICETE 2004)*, Setubal, Portugal, Sept. 2004
- 2004 *IADIS International Conference e-society 2004*.
- 2003 *IADIS International Conference e-society 2003*.

## **Selected Reviewing Activities**

- 2013 Annals of Operations Research, IEEE Communications Magazine, IEEE WiOpt 2013, IEEE Globecom 2013, IEEE Healthcom 2013, IEEE ICC 2013, QoMEX 2013, IEEE CAMAD 2013, ICCVE 2013.
- 2012 IEEE/ACM Transactions on Networking, IEEE Communications Magazine, IEEE Transactions on Network and Service Management, Speech Communication (Elsevier), IEEE ICC 2012, IFIP Networking 2012, IEEE IWQoS 2012, SoftCOM 2012, QoMEX 2012, IEEE CAMAD 2012
- 2011 IEEE Communications Magazine, IEEE ICC'11, IFIP Networking'11, IFIP/IEEE ManFed.Com'11, WiOpt'11, SmartApps'11, NGI'11, QoMEX'11, IEEE Transactions on Vehicular Technology
- 2010 IEEE Transactions on Network and Service Management, Journal of Computer Networks, International Journal of Network Management, Journal of Telecommunications Policy, IEEE ICC'10, WiOpt'10, IEEE RoEduNet'10, MAPPS'10, IASTED-HCI'10, MMB'10, e-society'10, BoD'10, Gecon'10, PERFORM'10, ITC-22

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|------|--|
| 2009 | IEEE Communications Magazine, EURASIP Journal on Wireless Communications and Networking; IEEE ICC'09, IEEE Globecom'09, International Teletraffic Congress ITC-21, IFIP Networking'09, ICQT'09, IASTED-HCI'09  |
| 2008 | Journal of Computer Networks, Journal of Universal Computer Science (J.UCS); IEEE ICC'09, KiVS'09, Euro-Par'08, IASTED-HCI'08, MMB'08  |
| 2007 | Journal of Computer Networks; WINSYS'07, Gecon'07, Euro-NGI'07, NET-COOP'07  |
| 2006 | Handbook of Computer Networks, JCN Journal of Communications and Networks, ACM Transactions on Multimedia Computing, Communications and Applications, Journal of Computer Networks; 64th IEEE Vehicular Technology Conference VTC-Fall 2006, ICQT'06, NETS (Networks and Spatial Economics), IFIP NETWORKING'06, IADIS e-society |
| 2005 | Journal of Computer Communications, European Journal of Operations Research, Journal of Computer Networks; NETS (Networks and Spatial Economics), IEEE ISSPIT'05, ICETE'05   |
| 2004 | Journal of Computer Communications, Journal of Telecommunication Systems; IEEE LCN'04, ICETE'04, ICQT'04, INFORMS'04, e-society'04   |
| 2003 | Journal of Computer Communications, Journal of Computer Networks, Journal of Network and Systems Management; IEEE Infocom'03, ICQT'03, e-society'03  |
| 2002 | ICQT'02, NOMS'02 (Network Operations and Management Symposium)   |
| 2001 | QoFIS'01, IEEE IM'01, ICQT'01  |
| 2000 | ACM SIGCOMM 2000, IWQoS 2000   |
| 1999 | ACM SIGCOMM'99, DSOM'99  |
| 1996 | TreDS'97 (Trends in Distributed Systems), KiVS'97  |

### **Consulting Activities for Research Funding Bodies**

|           |   |
|-----------|---|
| 2011-2013 | Innovation Fund, Republic of Serbia (consultant for Innovation Serbia Project)                |
| 2011      | Fundacja na rzecz Nauki Polskiej (Foundation for Polish Science), Poland                      |
| 2011      | EuroNF JSRP call 2011 (FP7 Network of Excellence EuroNF)                                      |
| 2010      | Deutsche Forschungsgemeinschaft (DFG), Bonn, Germany  |
| 2008      | ANR (Agence National de la Recherche) – Future Networks and Services Programme, Paris, France |
| 2008      | EuroNF JSRP call 2008 (FP7 Network of Excellence EuroNF)                                      |
| 2005      | BSF (United States – Israel Binational Science Foundation), Jerusalem, Israel                 |

## Further Skills

### Language Skills

- German (native speaker)
- English (excellent in speaking, reading and writing, living and studying for one year in Cambridge (UK), professional working language since 2001)
- French (fluent in speaking, reading and writing, 2 months language school in Paris 1992, research sabbaticals in 2008/2009/2010, living permanently in France 2010-2014)
- Italian (fair, regular stays in Milan and Lugano 1998–2001, Treviso 2013)
- Bulgarian (elementary level in speaking and reading)
- Latin (9 years at primary school, “Grosses Latinum”)
- Ancient Greek (3 years at primary school, “Graecum”)

### Music Skills

- 1982 – 1984 Studies in Sacred music with Prof. Sigrid Wildt (Conservatory of Nuremberg, Germany): organ, piano, conducting, music theory, counterpoint, solfège etc.
- 1984 Conducting debut: Anton Bruckner, “Das Wort ward Fleisch”, Treuchtlingen.
- Further instruments: piano, violin, violoncello (numerous concerts and recitals as member of various symphony orchestras, string quartets and chamber music formations)
- 1991/92 Member of the violon section of the CUMS I Orchestra (Cambridge, UK), conducted by Stephen Cleobury, Kwamé Ryan and Christopher Seaman.
- 1995 – 2001: Private voice studies with Robert Hoyem (Munich), Prof. Christoph Runge (Conservatory Aachen), Maurizio Frusoni (Rome), Prof. Elena Bajev (Conservatory Cologne) and Prof. Vittorio Terranova (Conservatorio di Milano, Italy).
- 1996 – 1998: Member of the Opera Chorus at Stadttheater Aachen: “Turandot” (Puccini), “Il Trovatore” (Verdi), “Tannhäuser” (Wagner). Recital in Cologne.
- 1998 – 2000: Studies at the “Neue Opernschule Zürich”, regular appearances at Zurich Congress Hall (staged excerpts e.g. from “Elisir d’Amore”, “Die Zauberflöte”, “Fidelio”, “Le Rossignol”, “Die Lustigen Weiber von Windsor”, “La Traviata” etc.)
- 05-06/1999: Summer camp of the International Institute for Vocal Arts New York, Chiari, Italy. Appearing in staged opera excerpts of “L’Elisir d’Amore” (Donizetti), “Tosca” (Puccini), “Don Quixote” (Massenet), “Don Giovanni” (Mozart) etc.
- 1999 – 2001 Member of the Zurich Pocket Opera, regular recitals in Zurich.
- 2000 Debut contract as Conte Almaviva in Rossini’s “Barber of Seville”, Teatro Puccini di Merano, Italy (cancelled due to a major fire disaster in the theatre building)
- Concerts and recitals in Milan, Cologne, Zurich, Aachen, Vienna (Musikverein debut in 2009 as Arturo in an excerpt of “Lucia di Lammermoor”), Nantes (Don Ottavio 2012)



## Referees

1. Prof. Dr. Otto Spaniol  
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4. Prof. Dr. Dominique Barth  
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Short CV (1000 characters):

Peter Reichl has been studying mathematics, physics and philosophy in Munich and Cambridge (UK). After finishing his PhD studies in Computer Science at RWTH Aachen and ETH Zurich, he became Key Researcher at FTW Telecommunications Research Center Vienna, Austria, where he was responsible for the research area "User-centered Interaction and Communication Economics". Dr. Reichl has published more than 100 journal and conference papers in the areas of telecommunication economics, user perception of telecommunication services and Quality-of-Experience, next generation networks, and future mobile networks and services. Following his habilitation at TU Graz, he became holder of the SISCOM and RBUCE WEST International Research Chairs on "Network-based Information and Communication Ecosystems" (NICE) at Université Européenne de Bretagne/INRIA/Télécom Bretagne in Rennes, France. In 2011 he was appointed Professor for Networking Technology at Aalto University Helsinki, Finland, and since 2013 he is Full Professor for Computer Science and head of the Research Group "Cooperative Systems (COSY)" at the University of Vienna.

Very Short CV (100 words):

Peter Reichl holds a Master's degree from the University of Cambridge (UK) and a PhD degree in computer science from RWTH Aachen. 2001-2013 he was Key Researcher for "User-centered Interaction and Communication Economics" at FTW Telecommunications Research Center Vienna. In 2011 he was appointed Professor for Networking Technology at Aalto University Helsinki, and became holder of the SISCOM and RBUCE WEST International Research Chairs at INRIA and Télécom Bretagne Rennes. Since 2013 he is Full Professor for Computer Science at University of Vienna. His main research interests include network economics, Quality of Experience and future cooperative systems.