Markus Fiedler

Docent Dr.-Ing.
Professor i teletrafiksystem
Blekinge Tekniska Högskola (BTH)
Institution för teknik och estetik (DITE)
Box 214, 374 24 Karlshamn, Sweden
markus.fiedler@bth.se
Tel./mobil: +46 708 537339

Akademiska grad

2006.12	Docent i telekommunikationssystem
1998.06	Dr.-Ing. (Ph.D.) i elektroteknik med fokus på information och kommunikationsteknik (IKT), Saarland's Universitet, Saarbrücken, Tyskland, med betyg "summa cum laude"
1993.12	Dipl.Ing. (M.Sc.E.) i elektroteknik med fokus på IKT, Saarland's Universitet, Saarbrücken, Germany, med betyg "utmärkt"

Anställningar och funktioner

2018.01–	Proprefekt, institution för teknik och estetik (DITE)
2014.01–2015.04	Prefekt, institution för kommunikationssystem (DIKO)
2011.09–	**Professor i teletrafiksystem, BTH**
2000.01–2011.08	Universitetslektor i teletrafiksystem, BTH
1998.04–1999.12	Gästlärare, Högskolan Karlskrona/Ronneby (nu BTH)
1994.01–1998.03	Vetenskaplig medarbetare (29 mån.) / stipendiat (22 mån.), Lehrstuhl för Nachrichten- und Vermittlungstechnik, Saarland's Universitet, Saarbrücken, Tyskland

Organisationer vid BTH

2017.01–	**Institution för teknik och estetik (DITE)**
2014.01–2016.12	Institution för kommunikationssystem (DIKO)
2009.04–2013.12	Sektion för datavetenskap och kommunikation (COM), Communication and Computer Systems Research Lab (CCS)
2004.04–2009.03	Sektion för teknik (TEK), avdelning för telekommunikationssystem (ATS)
1999.01–2004.03	Institution för telekommunikation och Signalbehandling (ITS)
1998.04–1998.12	Institution för telekommunikation och matematik (ITM)

Första forksningsområdet: **Quality of Experience (QoE)**

Mitt arbete inom QoE-området grundar sig i korrelationer mellan nätverksövervakningsdata och användaruppfattning samt efterföljande arbete med upplevd Quality of Service (QoS) inom excellensnätverket (NoE) EuroNGI. På grund av min teletrafikbakgrund närmade jag mig ämnet från nätverkssidan och undersökte effekterna av nätverksrelaterade parametrar på användarens kvalitetsuppfattning. Detta inkluderar modellering och förståelse av ömsesidiga beroenden mellan QoE och QoS samt tolkning av modellparametrar. Under åren fokuserade jag specifikt på fundamentala frågor kring QoE; QoE i sömlös kommunikation; QoE av strömmande video i mobila system; QoE och energi-effektivitet; QoE inom hälsoområdet; QoE modellering med hjälp av maskininlärning; och QoE i virtuell verklighet (VR). På grund av flytten till DITE (till följd av en omorganisation) och deras medietekniska program hamnade QoE av ljud- och bildproduktioner i mitt fokus. Jag ser mig själv som flitig "gränsgängare" mellan användare och infrastruktur, med målet att minimera klyftan mellan användarens förväntningar och applikationers och nätverkens leveranser, genom välgrundade val samt "QoE genom design".

Undervisning inom QoE området:

o Kurs "Quality of Experience" på masternivå (2018.04–)
o Kurs "Quality of Experience" på kandidatnivå vid Gunadarma University, Jakarta, Indonesien (2013.04–05)
o Euro-NF Ph.D. kurs "Quality of Experience" (2011.06)
o Inbjudna föreläsningar (2010–)
o Examensarbeten (2005–)

Aktiviteter inom QoE communityn:

o Inbjuden Keynote Speech "Chasing Milliseconds – On Temporal Challenges for Realtime-Rendered Virtual Reality" vid ICACS konferensen, Lahore, Pakistan (2020.02)
o Medorganisatör av Special Session "On Behalf of the User – Towards Advanced and Applicable QoE Modeling in Networked Settings" vid QoMEX 2019 konferensen, Berlin, Tyskland (2019.06)
o Medorganisatör av QoE Management workshoppen vid QoMEX 2018 konferensen, Sardinien, Italien (2018.05)
o Medorganisatör av Special Session "QoE Vadis?" vid QoMEX 2017, Erfurt, Tyskland (2017.05)
o Medorganisatör av Dagstuhl Perspectives Workshop 16472 "QoE Vadis?" om framtida inriktningar inom QoE forskningen (2016.11)
o Biträdande redaktör vid Springer "Journal of Quality and User Experience" (2016–)
o Medorganisatör av Dagstuhl Seminar 15022 "Quality of Experience: From Assessment to Application" (2015.01)
o Medorganisatör av Industrial Panel "Quality of End User Experience (QoE) for Network Services: Are we really measuring the right things?" vid ICC 2013 konferensen, Budapest, Ungern
o Medorganisatör av Dagstuhl Seminar 12181 "Quality of Experience: From User Perception to Instrumental Metrics" (2012.05)
o Medorganisatör av Dagstuhl Seminar 09192 "From Quality of Service to Quality of Experience" (2009.05)
o Organisatör av 18th International Teletraffic Congress Specialists Seminar on Quality of Experience (2008.05), av en serie av socio-ekonomiska aspekter av framtida nätverk (inom NoEs EuroFGI and Euro-NF, 2006–2010) och tillhörande special-nummer i vetenskapliga tidsskrifter (2008–2013)

Andra forskningsområdet: **Modellering och analys av teletrafik**

Jag blev uppmärksam på området som student i 1992. Jag började arbeta med flödesmodeller och använde dem senare för åtkomstkontroll (exjobbsuppsats) och dimensionering (doktorsavhandling) av kommunikationsresurser. Flödesmodellen kompletterades med tidsvariabel kapacitet under mitt första direktfinansierade projekt (av Deutsche Telekom, 1999). Medan jag arbetade med nätverks-övervakningsverktyg såg jag möjligheten att koppla trafikmätningar till flödesmodeller, genom att matcha multiplikativa Markov-modulerade flödesprocesser till mätningar på ett flertal relevanta tidsskalor, vilket utgör en mångsidig och kraftfull verktygslåda för modellering av teletrafik. Jag är särskilt intresserad av att bygga broar mellan teletrafikmodeller och QoE-modeller, och engagerar mig för tillämpningen av teletrafikmodellering och analys till gagn för användare och system (till exempel för energieffektiv videostreaming och VR).

Undervisning inom teletrafik-området:

o Kurs "Kapacitetsanalys" på masternivå (2018)
o Kurs "Simulering" på masternivå (1998.09–2017.06)
o Examensarbeten (1995–)

Aktiviteter inom teletrafik-området:

o Inbjuden Keynote Speech "Chasing Milliseconds – On Temporal Challenges for Realtime-Rendered Virtual Reality" vid ICACS konferensen, Lahore, Pakistan (2020.02)

- o Ansvarig inom programkommittén för området 1 "Performance Evaluation, Control and Optimization" vid 30th International Teletraffic Congress (ITC-30), Wien, Österrike (2018.09)
- o Medorganisatör och TPC Co-Chair för ITC-26, Karlskrona (2014.09)
- o Styrgruppsmedlem av "International Advisory Council" (IAC) för ITC, den första konferensen inom nätverksvetenskap och praktik (sedan 1955) (2013.09–)
- o Organisatör av "2nd European Teletraffic Seminar" (ETS), Karlskrona (2013.09)
- o Inbjuden föreläsning vid 1st ETS: "When teletraffic meets the user – building bridges between traffic analysis and Quality of Experience," Poznan, Polen (2011.02)
- o Medorganisatör av Dagstuhl Seminar 07042 "Performance Assessment Methods for Next Generation Internet" (2007.01)
- o Inbjuden föreläsning vid HETNETs 2005 "Measurement and analysis of application-perceived throughput via mobile links," Ilkley, UK (2005.07)

Fler relevanta aktiviteter och positioner

2016	Programkommitténs medordförande för "IFIP Wireless and Mobile Network Conference" (WMNC) 2016, Colmar, France
2013–2014	Svensk "Domain Committee Member" för IKT inom det europeiska COST programmet
2011–2012	"Future Internet Cluster Co-Chair" vid Europeiska Kommissionen, och organisation av en serie av "Future Internet Cluster Workshops"
2008–2012	Styrgruppsmedlem inom det europeiska excellensnätverket "Euro-NF" (Networks of the Future); organisatör av den avslutande konferensen NGI 2012, Karlskrona (2012.06)
2008–2015	Beslutsfattande redaktör vid tidskriften "European Transactions on Telecommunications", nu "Transactions on Emerging Telecommunication Technologies" (ETT)

Huvudhandledare för doktorander

1. Dr. Patrik Arlos (2005.10)
2. Dr. Henric Johnson (2005.12)
3. Dr. Lennart Isaksson (2008.03)
4. Dr. Alexandru Popescu (2014.04)
5. Dr. Charlott Lorentzen (2014.04)
6. Dr. Selim Ickin (2015.06)
7. Dr. Junaid Shaikh (2015.09)

Forskningsprojekt

2019–2021*	Nationellt projekt "PePP", finansierad av Ingvar Kamprads Stiftelse
2017–2021	Nationellt synergi projekt "ViaTecH", delfinansierad av KKS
2014–2020	Nationell forskningsprofil "BigData@BTH", delfinansierad av KKS
2014–2017(*)	Europeisk CELTIC projekt "CONVINcE", delfinansierad av VINNOVA
2013–2015(*)	Europeisk FI-PPP IP "FI-STAR"
2011–2012*	Europeisk CELTIC projekt "QuEEN", delfinansierad av VINNOVA
2009–2012**	Nationellt projekt "Quality of Experience Based Cross-Layer Optimization of Mobile Streaming On-Demand" (QoEMOS), delfinansierad av KKS
2008–2012*	Europeisk FP7 Network of Excellence "Euro-NF"
2008–2011*	Europeisk FP7 STREP "PERIMETER"
2007–2010*	Europeisk EUREKA projekt "Mobicome" (genom Telenor A/S, Norge)
2007–2010**	Nationellt projekt "Exploitation and Visualiation of Monitoring Information Used for Realising Always Best Connected" (EViMonA), delfinansierad av VINNOVA
2007–2009**	Nationellt projekt "Quality of Experience Based Cross-Layer Design of Mobile Video Systems" (QoEMoVi), delfinansierad av KKS
2006–2009*	Nationellt projekt "Smart Mobil Reseguide" (SMR), delfinansierad av VINNOVA

2006–2008* Europeisk FP6 Network of Excellence ”EuroFGI”
2004–2007* Nationellt projekt "Personal Information for Intelligent Transport Systems through Seamless communications and Autonomous decisions" (PIITSA), delfinansierad av VINNOVA
2003–2006* Europeisk FP6 Network of Excellence ”EuroNGI”
1999** Bilateralt projekt delfinansierad av Deutsche Telekom, Darmstadt, Germany

** Huvudsökande och projektledare
* Medsökande och ledare för BTHs del av projektet
På grund av en burn-out under 2015 fick projektledningsfunktion reduceras sedan dess.

Priser

2019.02 Best Paper Award vid 2019 IEEE ICACS för pappret "The Effects of Additional Factors on Subjective Quality Assessments"
2013.06 IEEE ComSoc Fred W. Ellersick Prize för artikeln ”A generic qualitative relationship between Quality of Experience and Quality of Service”
2013.01 Best Paper Award vid 2013 IEEE ComManTel för pappret ”Quality of Experience Hourglass Model”
2010.10 Årets Forskare vid BTH

Utvalda publikationer

Markus Fiedler's **h-index: 25** (as of Nov. 2019)

M. Fiedler, "Performance Analytics of a Virtual Reality Streaming Model," to be presented at the 20th International GI/ITG Conference on Measurement, Modelling and Evaluation of Computing Systems (MMB 2020), Saarbrücken, Germany, Mar. 2020

S. Ickin, K. Vandikas, and M. Fiedler, "Privacy preserving QoE modeling using collaborative learning," in Proc. 4th ACM Workshop on QoE-based Analysis and Management of Data Communication Networks (Internet-QoE 2019, with ACM MOBICOM 2019), Los Cabos, Mexico, Oct. 2019

M. Fiedler, "Performance analytics by means of the M5P Machine Learning algorithm," in Proc. 31st International Teletraffic Congress (ITC), Budapest, Hungary, Aug. 2019

M. Fiedler, U. Chapala, and S. Peteti, "Modeling instantaneous Quality of Experience using Machine Learning of model trees," in Proc. 2019 11th Int. Conf. on Quality of Multimedia Experience (QoMEX), Berlin, Germany, June 2019

M. Fiedler, H.J. Zepernick, and V. Kelkkanen, "Network-induced temporal disturbances in virtual reality applications," in Proc. 2019 11th Int. Conf. on Quality of Multimedia Experience (QoMEX), Berlin, Germany, June 2019

T.N. Minhas, O. Nawaz, M. Fiedler, and S. Khatibi, "The effects of additional factors on subjective quality assessments," in Proc. 2019 2nd Int. Conf. on Advancements in Computational Sciences (ICACS), Lahore, Pakistan, Feb. 2019

V. Kelkkanen and M. Fiedler, "Coefficient of Throughput Variation as indication of playback freezes in streamed omnidirectional videos," in Proc. 2018 28th Int. Telecommunication Network and Applications Conf. (ITNAC), Sydney, Australia, Nov. 2018

V. Kelkkanen and M. Fiedler, "A test-bed for studies of temporal data delivery issues in a TPCAST wireless virtual reality set-up," in Proc. 2018 28th Int. Telecommunication Network and Applications Conf. (ITNAC), Sydney, Australia, Nov. 2018

S. Eivazzadeh, J. S. Berglund, T. Larsson, M. Fiedler, and P. Anderberg, "Most influential qualities in creating satisfaction among the users of health information systems: Study in seven European Union countries," JMIR Med Inform 6(4):e11252;3–21, Oct-Dec. 2018

M. Fiedler, S. Möller, P. Reichl, and M. Xie, "A glance at the Dagstuhl Manifesto 'QoE Vadis?'," in Proc. 2018 10th Int. Conf. on Quality of Multimedia Experience (QoMEX), Sardinia, Italy, May 2018

E. Lagerspetz et al., "Pervasive communities in the Internet of People," in Proc. 2018 IEEE Int. Conf. on Pervasive Computing and Communications (PerCom) Workshops, Athens, Greece, March 2018

M. Fiedler, K. De Moor, H. Ravuri, P. Tanneedi, and M. Chandiri, "On relationships between QoE ratings, data volumes and intentions to churn," in Proc. 2017 LCN Workshop On User MObility and VEhicular Networks (LCN ON-MOVE), Singapore, Oct. 2017

Y. Yao, A. Popescu, M. Fiedler, and R. Ljung, "On the performance of mobile video streaming in energy-aware wireless mesh networks," in Proc. 2017 Europ. Conf. on Networks and Communications (EuCNC), Oulu, Finland, June 2017

F. Fotrousi, S.A. Fricker, and M. Fiedler, "The effects of requests for user feedback on Quality of Experience," Software Quality Journal, Springer, May 2017, 31 pp

T. Hoßfeld, M. Fiedler, and J. Gustafsson, "Betas: Deriving quantiles from MOS-QoE relations of IQX models for QoE management," in Proc. 2017 IFIP/IEEE Int. Symposium on Integrated Network and Service Management (IM 2017), Lisbon, Portugal, May 2017

O. Nawaz, T.N. Minhas, and M. Fiedler, "QoE based comparison of H.264 and WebM/VP8 in an error-prone wireless network," in Proc. 2017 IFIP/IEEE Int. Symposium on Integrated Network and Service Management (IM 2017), Lisbon, Portugal, May 2017

M. Fiedler, S. Möller, P. Reichl, and M. Xie, "QoE vadis? (Dagstuhl Perspectives Workshop 16472)," Dagstuhl Report 6(11):129–141, 2016; Dagstuhl Manifesto 7(1):30–51,2018

T.N. Minhas et al., "QoE rating performance evaluation of ITU-T recommended video quality metrics in the context of video freezes," Australian Journal of Electrical and Electronics Engineering 13(2):122–131, 2016

B. Shirmohamadi and M. Fiedler, "Bridging between Quality of Experience and Quality of Service through TCP Flag Ratios," Proc. 2016 LCN ON-MOVE, Dubai, UAE, Nov. 2016

M. Fiedler, A. Popescu, and Y. Yao, "QoE-aware sustainable throughput for energy-efficient video streaming," in Proc. of 2016 IEEE BDCloud, SocialCom and SustainCom, Atlanta, GA, Oct. 2016

D. Ammar, K. De Moor, M. Xie, M. Fiedler, and P. Heegaard, "Video QoE killers and performance statistics in Web-RTC-based video communication," in Proc. ICCE 2016, Ha Long, Vietnam, July 2016, pp 429–436

L. G. M. Ballesteros et al., "Energy Saving Approaches for Video Streaming on Smartphone based on QoE Modeling," in Proceedings of the 13th Annual IEEE Consumer Communications & Networking Conference (CCNC), Las Vegas, USA, 2016

S. Ickin et al., "VLQoE: Video QoE instrumentation on the smartphone," Multimedia Tools and Applications 74(2):381–411, Jan. 2015

K. de Moor, M. Fiedler, P. Reichl, and M. Varela, "Quality of Experience: From Assessment to Application (Dagstuhl Seminar 15022)," Dagstuhl Report 5(1):57–93, 2015

O. Nawaz, T.N. Minhas, and M. Fiedler, "QoE based comparison of H.264 and WebM/VP8 in an error-prone wireless network," in Proc. 2014 9th Int. Conf. for Internet Technology and Secured Transactions (ICITST), London, UK, Dec. 2014, pp 396–401

M. Fiedler, J. Shaikh, and V.J.D. Elepe, "Exponential on-off traffic models for Quality of Experience and Quality of Service assessment," Praxis der Kommunikationstechnik (PIK) 37(4):297–304, 2014

F. Fotrousi, S.A. Fricker, and M. Fiedler, "Quality requirements elicitation based on inquiry of quality-impact relationships," in Proc. 2014 IEEE 22nd Int. Requirements Engineering Conf. (RE), Karlskrona, Sweden, Aug. 2014

M. Fiedler, "On the limited potential of buffers to improve Quality of Experience," in Proc. 2014 IEEE Int. Conf. on Pervasive Computing and Communications Workshops, Budapest, Hungary, Mar. 2014

R. Schatz, M. Fiedler, and L. Skorin-Kapov, "QoE-based network and application management," Chapter 28 of S. Möller and A. Raake, eds: "Quality of Experience," Springer, 2014, pp 411–426

D. Stezenbach, K. Tutschku, and M. Fiedler, "A Performance Evaluation Metric for NFV Elements on Multiple Timescales," in Proc. of the IEEE Global Communications Conference (GLOBECOM), Atlanta, USA, Dec. 2013

T.N. Minhas and M. Fiedler, "Quality of Experience Hourglass Model," in Proc. IEEE ComManTel, Ho Chi Minh City, Vietnam, Jan. 2013. Best Paper Award

T. Ciszkowski et al., "Towards quality of experience-based reputation models for future web service provisioning," Telecommunication Systems, 51:283–295, Springer, 2012

J. Shaikh, M. Fiedler, P. Arlos, and D. Collange, "Modeling and analysis of web usage and experience based on link-level measurements," in Proc. 24th International Teletraffic Congress (ITC 24), Cracow, Poland, Sept. 2012

T. Hossfeld et al., "Initial delays vs. interruptions: Between the devil and the deep blue sea," in Proc. 2012 Int. Workshop on Quality of Multimedia Experience (QoMEX), Yarra Valley, Australia, Jul. 2012

D. Collange, M. Hajji, J. Shaikh, M. Fiedler, and P. Arlos, "User impatience and network performance," in Proc. NGI 2012, Karlskrona, Sweden, June 2012

S. Ickin et al., "Factors influencing quality of experience of commonly-used mobile applications," IEEE Communications Magazine, Special Issue on QoE Management in Emerging Multimedia Services, April 2012

M. Fiedler, S. Möller, and P. Reichl, "Quality of Experience: From user perception to instrumental metrics (Dagstuhl Seminar 12181)," Dagstuhl Report 2(5):1–25, 2012

C. Lorentzen, M. Fiedler, H. Johnson, and I. Jorstad, "Decisive factors for Quality of Experience of OpenID Authentication using EAP-SIM," in Proc. ETS 2011, Poznan, Poland, Feb. 2011

M. Fiedler, "On resource sharing and careful overbooking for network virtualisation," Int. Journal of Communication Networks and Distributed Systems (IJCNDS), 6(3), 2011

M. Fiedler and T. Hossfeld, "Quality of Experience-related differential equations and provisioning-delivery hysteresis," in Proc. 21st ITC Specialists Seminar on Multimedia Applications – Traffic, Performance and QoE, Miyazaki. Japan, Mar. 2010

M. Fiedler, T. Hossfeld, and P. Tran-Gia, "A generic quantitative relationship between Quality of Experience and Quality of Service," IEEE Network, 24(2):36–41, 2010. Awarded with IEEE ComSoc 2013 Fred W. Ellersick Prize

J. Shaikh, M. Fiedler, and D. Collange, "Quality of Experience from user and network perspectives," Annals of Telecommunications, 65(1–2):47–57, Jan./Feb. 2010

M. Fiedler, H.-J. Zepernick, L. Lundberg, P. Arlos, and M.I. Pettersson, "QoE-based cross-layer design of mobile video systems: Challenges and concepts," in Proc. RIVF 2009, Da Nang, Vietnam, 2009

T. Ciszkowski et al., "SecMon: End-to-end quality and security monitoring system", Annales UMCS, Informatica, 8(1):185–201, 2008

L. Isaksson and M. Fiedler, "Seamless connectivity in WLAN and cellular networks with Multi Criteria Decision Making," in Proc. NGI 2007, Trondheim, Norway, May 2007

S. Chevul, L. Isaksson, M. Fiedler, J. Karlsson, and P. Lindberg, "Measurement of application-perceived throughput of an E2E VPN connection using a GPRS network," Springer LNCS 3883: Wireless Systems and Network Architectures in Next Generation Internet, 2006

M. Fiedler, S. Chevul, O. Radtke, L. Tutschku, and A. Binzenhöfer, "The Network Utility Function: A practicable concept for assessing network impact on distributed services," in Prof. 19th International Teletraffic Congress (ITC 19), Beijing, China, Sept. 2005

L. Isaksson and M. Fiedler, "On-demand ad-hoc routing with Modified Reverse Path Forwarding for Bluetooth," in Proc. 2004 Australian Telecommunication Networks and Applications Conference (ATNAC), Sydney, Australia, Dec. 2004

M. Fiedler, K. Tutschku, P. Carlsson, and A.A. Nilsson, "Identification of performance degradation in IP networks using throughput statistics", in Proc. 18th International Teletraffic Congress (ITC 18), Berlin, Germany, Sept. 2003

M. Fiedler and K. Tutschku, "Application of the stochastic fluid flow model for bottleneck identification and classification," in Proc. 2003 Design, Analysis, and Simulation of Distributed Systems (DASD 2003), Orlando, FL, April 2003, pp 35–42

G. Haßlinger and M. Fiedler, "Why buffers in switching systems do not essentially improve QpE: An analytical case study for aggregard on-off traffic," in Proc. Internet Performance Control of Networked Systems, SPIE, Vol. 4895, Boston, MA, July 2002, pp 47–58

M. Fiedler, P. Carlsson, and A.A. Nilsson, "Voice and multi-fractal data traffic in the Internet," in Proc. 26th Annual IEEE Conf. on Local Computer Networks (LCN 2001), Tampa, FL, Nov. 2001, pp 426–431

M. Fiedler and U.R. Krieger, "The impact of variable channel capacity on the quality of advanced data services in PCS networks," in Proc. 12th ITC Specialists Seminar on Mobile Systems and Mobility, Lillehammer, Norway, Mar. 2000, pp 51–60

M. Fiedler and R.G. Addie, "Verification and application of a second-order scale symmetry for queueing systems," in Proc. 16th International Teletraffic Congress (ITC 16), Edinburgh, Scotland, June 1999, pp 807–816