

Curriculum Vitae — Martin Horauer



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Personal Born: March 19, 1969, Horn, Austria (Nationality: Austrian)
Data Languages: German (native), English, French
Marital Status: married since 2002, 2 children (born 2002 and 2006)

Current Position

FH-Prof., University of Applied Sciences Technikum Wien, Vienna, Austria.

Areas of Specialization

embedded systems, test & verification, automotive electronics

Appointments

- 2019– Board Member, “*Doctoral College Resilient Embedded Systems*”, TU Wien & University of Applied Sciences Technikum Wien
- 2018– Program Director, “*Master in Embedded Systems*”, University of Applied Sciences Technikum Wien
- 2006– Program Director, “*Bachelor in Electronic Engineering*”, University of Applied Sciences Technikum Wien
- 2005–2018 Associate Program Director, “*Master in Embedded Systems*”, University of Applied Sciences Technikum Wien
- 10/2004 Bestowal of “Professor (FH)” at the University of Applied Sciences Technikum Wien, Vienna, Austria
- 2002– Lecturer & Coordinator at the Department of Embedded Systems, University of Applied Sciences Technikum Wien, Department of Embedded Systems
- 1999–2002 Part-time Lecturer, University of Applied Sciences Technikum Wien
- 1997–2002 University Assistant, Vienna University of Technology – Department of Computer Technology
- 1995–1997 Research Assistant, Vienna University of Technology – Department of Computer Technology: Research Project SynUTC (Synchronized UTC for Distributed Real-Time Systems) funded by the Austrian Science Fund (FWF)
- 1994 Several short term jobs at Siemens AG (German - French interpreter), M. Horauer Electrical Engineering GmbH

Education

- 2004 Dr. techn. (graduation with distinction) – Vienna University of Technology
Thesis: “*Clock Synchronization in Distributed Systems*”
Advisors: Univ.-Prof. Dr. R. Eier & Univ.-Prof. Dr. U. Schmid
- 1994 Dipl.-Ing., Faculty of Electrical Engineering and Information Technology – Vienna University of Technology

Scientific Achievements

Awards

- 2011 Best paper, 16th International Workshop on Formal Methods for Industrial Critical Systems (FMICS '2011), Trento – Italy.
- 2010 Best paper, Workshop on Mathematical and Engineering Methods in Computer Science (MEMICS '2010), Mikulov – Czechia.
- 2010 Best paper award of the City Council of Vienna MA27 for the IEEE Transactions on Industrial Informatics paper entitled: “Towards a Systematic Test for Embedded Automotive Communication Systems”
- 2007 Best paper in Computational Methods and Software, 3rd ASME/IEEE Int. Conf. on Mechatronic and Embedded Systems and Applications (MESA '2007), Las Vegas – USA.
- 2005 Best paper award, 8th IEEE International Workshop on Design & Diagnostics of Electronic Circuits and Systems (DDECS '2005), Sopron – Hungary.
- 2001 Best student paper, Int. Conf. on Dependable Systems & Networks (DSN '2001), Gothenburg, Sweden.

Project Grants

- 2014–2017 “*Software Analyse Toolbox*” funded the City Administration of Vienna – MA23, Project Volume: 438k€.
- 2013–2018 “*Josef Ressel Center for Verification of Embedded Computing Systems*” funded the Christian Doppler Forschungsgesellschaft, Project Volume: 1,521k€.
Project cooperation's with: Bluetechnix R&D GmbH, Infineon Technologies Austria AG, Kapsch TrafficCom AG, Loytec electronics GmbH, Oregano Systems GmbH, Siemens AG Österreich
- 2010–2012 “*AC Centrope II*” funded by the European Regional Development Fund, Project Volume: 840k€.
- 2010–2012 “*Flexicount*” funded by the I2VSPPlus/ways2go program of the Austrian Research Promotion Agency (825286), Project Volume: 400k€.
- 2010–2013 “*Design and Verification Patterns for Embedded Systems*” funded by the City Administration of Vienna – MA27, Project Volume: 480k€.
- 2006–2008 “*Automotive Gateways*” funded by the City Administration of Vienna – MA27, Project Volume: 295k€.
- 2005–2010 “*Design methods for embedded control systems*” funded by the FHplus program of the Austrian Research Promotion Agency (811414).
Project cooperation's with: Elektrobit GmbH, RWTH Aachen – Department of Computer Science XI, Audi Venture Electronics GmbH; Project Volume: 1M€.
- 2005–2007 “*Component based Automotive System Software*” funded by the FIT-IT program of the Austrian Research Promotion Agency (809444).
Project partners: Distributed Systems Group – Vienna University of Technology, Decomsys GmbH; Project Volume: 1M€.
- 2003–2005 “*Systematic Test of Embedded Automotive Communication Systems*” funded by the FIT-IT program of the Austrian Research Promotion Agency (807146).
Project partners: Embedded Computing Systems Group – Vienna University of Technology, Decomsys GmbH; Project Volume: 575k€.

Industry Projects

- 2012 “*Audio-Recorder for Smartphones*”, play.fm
- 2010 “*Wireless Embedded Monitoring Device for a Manufacturing Plant*”, Metusan GmbH
- 2009 “*Design and Verification Support for a Distributed Real-time System – MiniDIS*”, Grabner Instruments GmbH
- 2006–2007 “*Data Collection Platform – Development of a Satellite Modem for the Transfer of Environmental Data via the GOES and METEOSAT orbital systems*”, Logotronic GmbH

Publications

Book Chapters and Editorials

- [B1] M. Horauer: *Clock Synchronization in Distributed Systems - Architecture and Evaluation of Ethernet-based Network Interfaces with support for precision clock synchronization*, Doctoral Thesis, Vienna University of Technology 2004, Südwestdeutscher Verlag für Hochschulschriften SVH, 2009, ISBN: 978-3-8381-0334-1.
- [B2] P. Balog and M. Horauer: *Austrochip '2006 - Die österr. Tagung zum Themenbereich des Entwurfs integrierter Schaltungen und Systeme*, University of Applied Sciences Technikum Wien, p. 218, 2006, ISBN-13: 978-3-200-00770-3.
- [B3] M. Horauer and P. Rössler: *Chapter: FlexRay*, Industrial Electronics Handbook (2nd Edition), p. 4052, Publisher: CRC Press, March 2011, ISBN: 9781439802892.

Journal Articles, Magazines & Book Series

- [J1] K. Schossmaier, U. Schmid, M. Horauer, and D. Loy: *Specification and Implementation of the Universal Time Coordinated Synchronization Unit (UTC/SU)*, Journal of Real-Time Systems, No. 3, Vol. 12, pp. 295–327, May. 1997.
- [J2] P. Milbredt, M. Horauer, and K. Reif: *Wakeup and Startup of FlexRay Cross Linkings*, ATZ elektronik, pp. 30–32, Dez. 2007, ISSN 1862-1791 70934.
- [J3] E. Armengaud, A. Steininger, and M. Horauer: *Towards a Systematic Test for Embedded Automotive Communication Systems*, IEEE Transactions on Industrial Informatics, Vol. 4 Iss. 3, pp. 146–155, 2008.
- [J4] Th. Reinbacher, M. Horauer, B. Schlich, J. Brauer, and F. Scheuer: *Model Checking Embedded Software of an Industrial Knitting Machine*, International Journal on Information Technology, Communications, and Convergence, Inderscience, Vol. 1, No. 2, pp. 186–205, 2011.
- [J5] Th. Reinbacher, J. Brauer, M. Horauer, A. Steininger, and St. Kowalewski: *Test-Case Generation for Embedded Binary Code Using Abstract Interpretation*, in “Sixth Doctoral Workshop on Mathematical and Engineering Methods in Computer Science (MEMICS’10) – Selected Papers”, Ludek Matyska, Michal Kozubek, Tomas Vojnar, Pavel Zemcik and David Antos (Eds.), Open Access Series in Informatics, pp. 101–108, Dagstuhl Publishing OASICS Vol. 16, 2011, ISBN: 978-3-939897-22-4.
- [J6] M. Horauer, M. Zauner, and H. Schuster: *A System-level Test for Automotive Communication Subsystems*, Elektrotechnik & Informationstechnik (e&i), Iss. 6.2011, pp. 215–221, 2011.
- [J7] Th. Reinbacher, J. Brauer, M. Horauer, A. Steininger, and St. Kowalewski: *Past Time LTL Runtime Verification for Microcontroller Binary Code*, FORMAL METHODS FOR INDUSTRIAL CRITICAL SYSTEMS, Lecture Notes in Computer Science, 2011, Volume 6959/2011, pp. 37–51, DOI: 10.1007/978-3-642-24431-5_5, 2011.
- [J8] Th. Reinbacher, J. Brauer, M. Horauer, A. Steininger, and St. Kowalewski, *Runtime verification of microcontroller binary code*, Science of Computer Programming, Volume 80, Part A, 1 February 2014, Pages 109-129, ISSN 0167-6423, <http://dx.doi.org/10.1016/j.scico.2012.10.015>.
- [J9] M. Horauer, D. Widhalm, St. Tauner, and St. Mirtl: *Verification challenges of complex system-on-chip devices*, e & i Elektrotechnik und Informationstechnik: Volume 132, Issue 6 (2015), Page 269-273. DOI: 10.1007/s00502-015-0314-5.
- [J10] Ch. Fibich, St. Tauner, P. Rössler, M. Horauer, M. Matschnig, and H. Taucher: *FIIJ: Fault Injection Instrumenter*, EURASIP Journal on Embedded Systems, Februar 2019, 19 pages, ISSN 1687-3963, doi 10.1186/s13639-019-0088-7.

Peer-Reviewed Conference Papers

- [C1] M. Horauer and D. Loy: *Adder Synthesis*, Proceedings Austrochip '95, Graz Austria, pp. 81–87, 1995.
- [C2] M. Horauer and D. Loy: *UTCLIENT - an ASIC Supporting Clock Synchronization in Distributed Real-Time Systems*, Proceedings Austrochip '97, Universitätsverlag Rudolf Trauner, pp. 290–296, Linz – Austria, Apr. 1997, ISBN 3 85320 826 6.
- [C3] M. Horauer and D. Loy: *Hardware-unterstützte Uhrensynchronisation in verteilten Systemen*, Proceedings Austrochip '98,

- pp. 67–72, Wiener Neustadt – Austria, Oct. 1998, ISBN 3-901578-03-X.
- [C4] M. Horauer, U. Schmid, and K. Schossmaier: *NTI: A Network Time Interface M-Module for High-Accuracy Clock Synchronization*, 6th International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS), published in the Lecture Notes in Computer Science “Parallel and Distributed Processing”, Springer, pp. 1067–1076, Orlando – Florida, 1998, ISBN 978-3-540-64359-3.
- [C5] U. Schmid, M. Horauer, and N. Kerö: *How to Distribute GPS-Time over COTS-based LANs*, 31st Annual Precise Time and Time Interval Systems and Applications Meeting (PTTI ’99), Dana Point – California, Dec. 1999.
- [C6] M. Horauer, N. Kerö, and U. Schmid: *A network interface for highly accurate clock synchronization*, Proceedings Austrochip ’2000, pp. 93–101, Graz – Austria, 2000, ISBN 3-9501349-0-5.
- [C7] M. Horauer: *Hardware Support for Clock Synchronization in Distributed Systems*, Supplement of the 2001 Int. Conf. on Dependable Systems and Networks, pp. A-10–A-13, Gothenburg, Sweden, Jul. 2001.
- [C8] R. Höller, G. Gridling, M. Horauer, N. Kerö, U. Schmid, and K. Schossmaier: *SynUTC - High Precision Time Synchronization over Ethernet Networks*, Proceedings of the 8th Workshop on Electronics for LHC Experiments, Colmar – France, Sept. 2002.
- [C9] M. Horauer and R. Höller: *Integration of high accurate Clock Synchronization into Ethernet-based Distributed Systems*, Int. Conf. on Advances in Infrastructure for e-Business, e-Education, e-Science, and e-Medicine on the Internet (SSGRR ’2002), L’Aquila – Italy, Jan. 2002.
- [C10] M. Horauer, U. Schmid, K. Schossmaier, R. Höller, and N. Kerö: *PSynUTC - Evaluation of a High Precision Time Synchronization Prototype System for Ethernet LANs*, Proceedings of the 34th IEEE Precise Time and Time Interval Systems and Application Meeting (PTTI ’02), Reston – Virginia – USA, Dec. 2002.
- [C11] N. Kerö, H. Muhr, G. Gaderer, R. Höller, T. Sauter, and M. Horauer: *Embedded SynUTC and IEEE 1588 Clock Synchronization for Industrial Ethernet*, Workshop on IEEE-1588, Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems, National Institute of Standards and Technology, Gaithersburg – Maryland – USA, Sept. 2003.
- [C12] R. Pallierer, M. Horauer, and A. Steininger: *Monitoring and Fault-Injection of X-by-Wire Communication Networks*, Design & Elektronik Tagungsunterlagen zum Entwicklerforum “Drahtlose und drahtgebundene Netzwerke 2004”, Munich – Germany, Jul. 2004.
- [C13] M. Horauer, F. Rothensteiner, M. Zauner, E. Armengaud, A. Steininger, H. Friedl, and R. Pallierer: *An FPGA based SoC Design for Testing Embedded Automotive Communication Systems employing the FlexRay Protocol*, Proceedings Austrochip 2004, pp. 119–123, Villach – Austria, Oct. 2004, ISBN: 3-200-00211-5.
- [C14] E. Armengaud, A. Steininger, M. Horauer, R. Pallierer, and H. Friedl: *A Monitoring Concept for an Automotive Distributed Network – The FlexRay Example*, 7th IEEE Workshop on Design & Diagnostics of Electronic Circuits & Systems (DDECS ’2004), pp. 173–178, Slovakia, Apr. 2004.
- [C15] E. Armengaud, A. Steininger, M. Horauer, and R. Pallierer: *Trade-offs for Systematic Tests of Embedded Communication Systems*, Supplemental Volume of the 2004 Int. Conf. on Dependable Systems and Networks (DSN ’2004), pp. 118–119, Florence – Italy, Jun. 2004.
- [C16] E. Armengaud, A. Steininger, M. Horauer, and R. Pallierer: *A Layer Model for the Systematic Test of Time-Triggered Automotive Communication Systems*, 5th IEEE International Workshop on Factory Communication Systems (WFCS ’2004), pp. 275–283, Vienna – Austria, Sept. 2004.
- [C17] R. Pallierer, M. Horauer, M. Zauner, A. Steininger, E. Armengaud, and F. Rothensteiner: *A Generic Tool for Systematic Tests in Embedded Automotive Communication Systems*, Embedded World 2005 Conference, pp. 42–49, Nürnberg – Germany, Feb. 2005.
- [C18] E. Armengaud, A. Steininger, and M. Horauer: *A Flexible Hardware Architecture for Fast Access on Large Non-Volatile Memories*, 8th IEEE International Workshop on Design and Diagnostics of Electronic Circuits and Systems (DDECS ’2005), pp. 113–120, Sopron – Hungary, Apr. 2005.
- [C19] E. Armengaud, A. Steininger, and M. Horauer: *A Method for Bit Level Test and Diagnosis of Communication Services*, 8th IEEE International Workshop on Design and Diagnostics of Electronic Circuits and Systems (DDECS ’2005), pp. 69–74, Sopron – Hungary, Apr. 2005.
- [C20] E. Armengaud, F. Rothensteiner, A. Steininger, R. Pallierer, M. Horauer, and M. Zauner: *A Structured Approach for the Systematic Test of Embedded Automotive Communication Systems*, IEEE International Test Conference (ITC ’2005),

- paper 2.1, Austin – USA, Nov. 2005.
- [C21] E. Armengaud, A. Steininger, and M. Horauer: *Efficient Stimulus Generation for Remote Testing of Distributed Systems - The FlexRay Example*, 10th IEEE Int. Conf. on Emerging Technologies and Factory Automation (ETFA '2005), pp. 763–770, Catania – Italy, Sept. 2005, ISBN: 0-7803-9402-X.
- [C22] E. Armengaud, A. Steininger, and M. Horauer: *An Efficient Test and Diagnosis Environment for Communication Controllers*, Proceedings Austrochip 2005, pp. 67–70, Vienna – Austria, Oct. 2005.
- [C23] E. Armengaud, A. Steininger, and M. Horauer: *Automatic Parameter Identification in FlexRay based Automotive Communication Networks*, 11th IEEE Int. Conf. on Emerging Technologies and Factory Automation (ETFA '2006), pp. 897–904, Prague - Czech Republic, Sept. 2006.
- [C24] H. Muhr, R. Höller, and M. Horauer: *A Heterogeneous Hardware-Software Co-Simulation Environment Using User Mode Linux and Clock Suppression*, Proceedings of the 2nd IEEE/ASME Int. Conf. on Mechatronic and Embedded Systems and Applications (MESA '2006), pp. 20–25, Beijing – China, Aug. 2006.
- [C25] Th. Galla, D. Schreiner, W. Forster, Ch. Kutschera, K.M. Göschka, and M. Horauer: *Refactoring an Automotive Embedded Software Stack using the Component-Based Paradigm*, Proceedings of the 2nd IEEE Int. Symp. on Industrial Embedded Systems (SIES '2007), pp. 200–208, Lisbon – Portugal, Jul. 2007, ISBN: 1424408407.
- [C26] M. Horauer, O. Praprotnik, M. Zauner, R. Höller, and P. Milbredt: *A Test Tool for FlexRay-based Embedded Systems*, Proceedings of the 2nd IEEE Int. Symp. on Industrial Embedded Systems (SIES '2007), pp. 349–352, Lisbon – Portugal, Jul. 2007, ISBN: 1-4244-0840-7.
- [C27] M. Horauer, E. Armengaud, and A. Steininger: *Concepts and Tools for the Test of the Communication Sub-System of Time-Triggered Distributed Embedded Systems*, Proceedings of the 3rd IEEE/ASME Int. Conf. on Mechatronic and Embedded Systems and Applications (MESA '2007), p. 8, Las Vegas – USA, Sept. 2007, DETC 2007-34439.
- [C28] P. Milbredt, A. Steininger, and M. Horauer: *Automated Testing of FlexRay Clusters for System Inconsistencies in Automotive Networks*, Proceedings of the 4th IEEE Int. Symp. on Electronic Design, Test & Applications (DELTA '2008), pp. 533–538, Hong Kong, Jan. 2008.
- [C29] P. Milbredt, M. Horauer, and A. Steininger: *An Investigation of the Clique Problem in FlexRay*, Proceedings of the 3th IEEE Symp. on Industrial Embedded Systems (SIES '2008), pp. 224–231, Montpellier – France, Jun. 2008.
- [C30] Th. Reinbacher, M. Kramer, M. Horauer, and B. Schlich: *Challenges in Embedded Model Checking – A Simulator for the [mc]square Model Checker*, Proceedings of the 3rd IEEE Int. Symp. on Industrial Embedded Systems (SIES '2008), pp. 277–280, Montpellier – France, Jun. 2008.
- [C31] P. Rössler, J. Radlbauer, M. Horauer, F. Lukasch, and M. Wimmer: *Development of a Data Collection Platform*, Proceedings of IEEE Int. Symp. on Industrial Electronics (ISIE '2008), CD-006343, Cambridge – UK, Jun. 2008.
- [C32] Th. Reinbacher, M. Kramer, M. Horauer, and B. Schlich: *Motivating Model Checking of Embedded Systems Software*, Proceedings of the 4th IEEE/ASME Int. Conf. on Mechatronic and Embedded Systems and Applications (MESA '2008), pp. 546–551, Beijing – China, Oct. 2008, ISBN: 978-1-4244-2367-5.
- [C33] Th. Reinbacher, M. Horauer, and B. Schlich: *Using 3-valued Memory Representation for State Space Reduction in Embedded Assembly Code Model Checking*, Proceedings of the 12th IEEE Symp. on Design and Diagnostics of Electronic Systems (DDECS '2009), pp. 114–119, April 15-17, 2009, Liberec, Czech Republic.
- [C34] P. Balog, M. Horauer, and P. Rössler: *Remote LAB infrastructure for Distance Learning Courses at the Undergraduate Level in Embedded Systems Design*, Proceedings of the 2009 ASME/IEEE Int. Conf. on Mechatronic and Embedded Systems and Applications (MESA '2009), p. 6, DETC 2009-87148, Aug. 30-Sept. 02, 2009, San Diego, USA.
- [C35] Th. Reinbacher, J. Brauer, M. Horauer, and B. Schlich: *Refining assembly code static analysis for the Intel MCS-51 microcontroller*, Proceedings of the 2009 Int. Symp. on Industrial Embedded Systems (SIES '2009), pp. 161–170, July. 8-10, 2009, Lausanne, Switzerland.
- [C36] O. Praprotnik, M. Gartner, M. Zauner, and M. Horauer: *A Test Suite for System Tests of Distributed Automotive Electronics*, Proceedings of the 2nd Int. Conf. on Advances in Circuits, Electronics and Micro-electronics (CENICS '2009), pp. 67–70, Oct. 11-16, Malta.
- [C37] Th. Reinbacher, M. Horauer, B. Schlich, J. Brauer, and F. Scheuer: *Model Checking Assembly Code of an Industrial Knitting Machine*, Proceedings of the 4th IEEE Int. Conf. on Embedded and Multimedia Computing (EM-Com '2009), pp. 97–104, Dec. 10-12, Jeju, Korea.

- [C38] Th. Reinbacher and M. Horauer: *Formale Verifikation von Embedded Systems Software*, Informationstagung Mikroelektronik (ME '2010), pp. 289–296, Vienna, Austria, April 7-8, 2010. (in german)
- [C39] M. Horauer, M. Ray, A. Augustin, and G. Novak: *FlexiCount: Eine flexible Personenzählmatte für den mobilen Indoor und Outdoor Einsatz*, Proceedings Real Corp 2010, pp. 1095–1100, Vienna, Austria, May 18-20, 2010. (in german)
- [C40] P. Niklas, M. Zauner, and M. Horauer: *Development of an Embedded Monitoring Device for a Manufacturing Plant*, Proceedings of the 2010 IEEE/ASME Int. Conf. on Mechatronic and Embedded Systems and Applications (MESA 2010), p. 398-402, July 15-17, 2010, Qingdao, China.
- [C41] Th. Reinbacher, J. Brauer, M. Horauer, A. Steininger, and St. Kowalewski: *Test-Case Generation for Embedded Binary Code Using Abstract Interpretation*, Annual Doctoral Workshop on Mathematical and Engineering Methods in Computer Science (MEMICS 2010), Brno, 2010.
- [C42] Th. Reinbacher, A. Steininger, T. Müller, M. Horauer, and J. Brauer: *A Hardware Property Checking Unit with Applications in Abstract Interpretation Based Testing of Embedded Software*, Proceedings of the ASME 2011 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference – ASME/IEEE MESA '2011, August 29-31, 2011, DETC 2011-47139, pp. 1-10, Washington, DC, USA.
- [C43] Ch. Kutschera, M. Horauer, M. Ray, D. Steinmair, and P. Gorski: *A flexible sensor-mat to automate the process of people counting*, Proceedings of the Fourth Int. Conf. on Advances in Circuits, Electronics and Micro-electronics (CENICS 2011), pp. 13–16, August 21-27, 2011 – Nice/Saint Laurent du Var, France, 2011. ISBN: 978-1-61208-150-2
- [C44] Th. Reinbacher, J. Brauer, M. Horauer, A. Steininger, and St. Kowalewski: *Past Time LTL Runtime Verification for Microcontroller Binary Code*, Proceedings of the 16th International Workshop on Formal Methods for Industrial Critical Systems (FMICS 2011), pp. 37–51, Trento (Italy), August 29-30, 2011.
- [C45] Th. Reinbacher, D. Gückel, and M. Horauer: *Testing Microcontroller Software Simulators*, Proceedings of the 1st Workshop on Software Language Engineering for Cyber Physical Systems at Informatik 2011, Berlin, Germany, Oct. 04-07, 2011.
- [C46] Th. Reinbacher, M. Horauer, and A. Steininger: *A Runtime Verification Unit for Microcontrollers*, Proceedings of the System, Software, SoC and Silicon Debug Conference S4D 2012, Vienna, Austria, Sept. 19-20, 2012.
- [C47] Th. Reinbacher, J. Geist, P. Moosbrugger, M. Horauer, and A. Steininger, *Parallel runtime verification of temporal properties for embedded software*, in Proceedings of the 8th IEEE/ASME Int. Conf. on Mechatronic and Embedded Systems and Applications (MESA '12), pp. 224-231, Suzhou, China, July 8-10, 2012.
- [C48] M. Horauer, H. Schuster, and P. Balog: *Experimental Assessment of the Clique Problem in FlexRay*, Proceedings of the 8th ASME/IEEE Int. Conf. on Mechatronic and Embedded Systems and Applications, paper no. DETC 2013-12888, Portland OR, USA, Aug. 04-07, 2013.
- [C49] H. Schuster, M. Horauer, M. Kramer, H. Liebhart, and J. Büger, *A Log-Tool Suite for Embedded Systems*, Proceedings of the 7th Int. Conf. on Advances in Circuits, Electronics and Micro-electronics (CENICS '2014), November 16-20, 2014 - Lisbon, Portugal, 2014.
- [C50] A. Puhm, M. Kramer, P. Moosbrugger, and M. Horauer, *Problems and solutions for refitting a sensor network with IEEE1588 clock synchronisation*, Proceedings of the 19th IEEE Int. Conf. on Emerging Technologies and Factory Automation (ETFA '2014), p. 7, September 16-19, Barcelona - Spain, 2014, ISBN: 978-1-4799-4846-8.
- [C51] R. Beder, B. Glatz, M. Horauer, and Th. Rauscher, *Memory Leak Detection Runtime-Service for Embedded Linux Devices*, Proceedings of the 19th IEEE Int. Conf. on Emerging Technologies and Factory Automation (ETFA '2014), p. 6, September 16-19, Barcelona - Spain, 2014, , ISBN: 978-1-4799-4846-8.
- [C52] R. Beder, B. Glatz, M. Horauer, and Th. Rauscher, *Runtime Verification Infrastructure for Embedded Linux*, Proceedings of the 10th IEEE/ASME Int. Conf. on Mechatronics and Embedded Systems and Applications (MESA'14), paper ID 017, p. 6, September 10-12, Senigallia - Italy, 2014.
- [C53] D. Widhalm, St. Tauner, M. Horauer, A. Schumacher, and A. Hagenmiller: *A Common Platform for Bridging Pre- and Post-Silicon Verification in Mixed-Signal Designs*, Proceedings of the 2015 IEEE International Instrumentation and Measurement Technology Conference (I2MTC '2015), p. 6, May 11-14, 2015.
- [C54] A. Puhm, M. Karmer, and M. Horauer: *An Algorithm to Evaluate and Build Schedules for a Distributed Sensor System with Respect to Clock Synchronization*, The Ninth Int. Conf. on Sensor Technologies and Applications SENSOR-COMM 2015, pp. 64–70, Venice, August 2015, ISBN: 978-1-61208-425-1.
- [C55] B. Glatz, R. Beder, M. Horauer, and Th. Rauscher: *Deadlock Detection Runtime Service for Embedded Linux*, Pro-

- ceedings of the 2015 IEEE 20th Conference on Emerging Technologies and Factory Automation (ETF A 2015), p. 7, Luxembourg, 8-11 Sept. 2015. ISBN 978-1-4673-7928-1.
- [C56] St. Tauner, D. Widhalm, and M. Horauer: *Synchronization Approaches for Testing Mixed-Signal SoCs under Real-Time Constraints using On-Chip Capabilities*, Proceedings of the 2015 IEEE Austrian Workshop on Microelectronics, pp. 36–41, Vienna, 28 Sept. 2015, DOI 10.1109/Austrochip.2015.8.
- [C57] M. Kramer and M. Horauer: *Software Based Methods to Harden Embedded Software at Run-Time: A Survey*, Volume 9: 2015 ASME/IEEE Int. Conf. on Mechatronic and Embedded Systems and Applications, Boston, Massachusetts, USA, August 2-5, 2015, DETC 2015-47357, pp. V009T07A008; 5 pages doi:10.1115/DETC2015-47357, ISBN: 978-0-7918-5719-9.
- [C58] B. Glatz, F. Cleary, M. Horauer, H. Schuster, and P. Balog: *Complementing Testing of IEC61499 Function Blocks with Model-Checking*, The 12th IEEE/ASME Int. Conf. on Mechatronic and Embedded Systems and Applications, (MESA '2016), ID: 86, p. 7, Auckland, New Zealand, 29-31 August 2016.
- [C59] D. Widhalm, St. Tauner, and M. Horauer: *Augmenting Pre-Silicon Simulation by embedding a Scripting Language in a SystemC Environment*, The 12th IEEE/ASME Int. Conf. on Mechatronic and Embedded Systems and Applications, (MESA '2016), ID: 83, p. 6, Auckland, New Zealand, 29-31 August 2016.
- [C60] B. Glatz, H. Schuster, M. Horauer, Th. Rauscher, and R. Obermaisser: *Fault Injection for IEC 61499 Applications*, Proceedings of the 21st IEEE Int. Conf. on Emerging Technologies and Factory Automation (ETF A '2016), Berlin, Germany, 2016-09-06 – 2016-09-09.
- [C61] Th. Jerabek and M. Horauer: *Static Worst-Case Execution Time Analysis Tool Development for Embedded Systems Software*, The Ninth Int. Conf. on Dependability (DEPEND '2016), pp. 7–14, Nice, July 2016, ISBN: 978-1-61208-492-3.
- [C62] St. Tauner, D. Widhalm, and M. Horauer: *Unification of Pre- and Post-Silicon Verification Flows in Mixed-Signal Designs*, Microelectronic Systems Symp. (MESS'2016), Vienna, Austria.
- [C63] Ch. Fibich, M. Horauer, and R. Obermaisser: *HLSshield: A Reliability Enhancement Framework for High-Level Synthesis*, Proceedings of the 12th IEEE Int. Symp. on Industrial Embedded Systems (SIES '2017), p. 10, 14-16 June 2017, Toulouse, France.
- [C64] F. Gerstmayer, J. Hausladen, M. Kramer, and M. Horauer: *A Binary Protection Framework for Embedded Systems Software*, Proceedings of the 12th IEEE Int. Symp. on Industrial Embedded Systems (SIES '2017), p. 8, 14-16 June 2017, Toulouse, France.
- [C65] J. Hausladen, F. Gerstmayer, Th. Jerabek, and M. Horauer: *Integration of Static Worst-Case Execution Time & Stack Usage Analysis for Embedded Systems Software in a Cloud-Based Development Environment*, Proceedings of 13th ASME/IEEE Int. Conf. on Mechatronic & Embedded Systems & Applications (MESA), IDETC/CIE 2017, DETC2017-67402, p. 6, August 6-9, 2017, Cleveland, Ohio, USA.
- [C66] J. Hausladen, F. Gerstmayer, M. Kramer, and M. Horauer: *Methods for Protection of Intellectual Property in Embedded Software – A Survey*, Proceedings of 13th ASME/IEEE Int. Conf. on Mechatronic & Embedded Systems & Applications (MESA), IDETC/CIE '2017, DETC2017-67422, p. 9, August 6-9, 2017, Cleveland, Ohio, USA.
- [C67] Ch. Fibich, M. Horauer, and R. Obermaisser: *Vulnerability Analysis of Storage Elements in HLS-Generated Designs using High-Level Profiling*, Proceedings of the 2nd Int. Conf. on System Reliability and Safety (ICSRS '2017) p. 190–194., 20-22 December 2017, Milan, Italy.
- [C68] Ch. Fibich, M. Horauer, and R. Obermaisser: *Automated Fault Tolerance Augmentation for HLS-Generated FPGA Designs*, Microelectronic Systems Symp. (MESS'2018), Vienna, Austria.
- [C69] Ch. Fibich, St. Tauner, P. Rössler, M. Horauer, M. Matschnig, and H. Taucher: *Preliminary Evaluation of High-level Synthesis Tools - Xilinx Vivado and PandA Bambu*, Proceedings of 13th Int. Symp. on Industrial Embedded Systems (SIES '2018), June 6-8, 2018, Graz, Austria.
- [C70] D. Pescha and M. Horauer: *Eventroms in IEC 61499 Applications*, XXXIII Conference on Design of Circuits and Integrated Systems (DCIS '2018), Lyon, France.
- [C71] Ch. Fibich, M. Horauer, and R. Obermaisser, *Reliability-Enhanced High-Level Synthesis using Memory Profiling and Fault Injection*, 2019 IEEE 28th International Symposium on Industrial Electronics (ISIE), Vancouver, BC, Canada, 2019, pp. 1363-1370. doi: 10.1109/ISIE.2019.8781158.
- [C72] Ch. Fibich, S. Tauner, P. Rössler, M. Horauer, M. Krapfenbauer, M. Linauer, M. Matschnig and H. Taucher, *Evaluation of Open-Source Linear Algebra Libraries in Embedded Applications*, 8th Mediterranean Conference on Em-

bedded Computing (MECO), co-sponsored by IEEE, p. 6, Budva, Montenegro, June 10-14, 2019.

Patents

- [P1] N. Kerö, U. Schmid, and M. Horauer: *Method for synchronizing computer clocks in networks used for information transmission, device for carrying out said method and data packet suitable for the synchronization of computer clocks*, Patent No.: AT5327U (Austrian Patent 05-27-2002), Patent No.: EP1261905 (European Patent 04-12-2002), Patent No.: US2003154309 (US Patent 14-08-2003), Patent No.: WO0167216 (Worldwide Patent 13-09-2001).

Services to the Profession

Chairing

- 2018-2019 Track Co-Chair, IEEE Int. Conf. on Emerging Technologies & Factory Automation (ETFAs)
2016–2018 Track Co-Chair, IEEE Int. Symp. on Industrial Embedded Systems (SIES)
2012 General Chair, ASME/IEEE Int. Conf. on Mechatronic & Embedded Systems & Applications (MESA'12)
2011 Program Chair, ASME/IEEE Int. Conf. on Mechatronic & Embedded Systems & Applications (MESA'11)
2008 Track Co-Chair, IEEE Int. Symp. on Industrial Embedded Systems (SIES)
2006-2017 Co-Chair, Symposia on “Embedded Systems Infrastructure & Theory” IEEE/ASME MESA
2006 Program Chair, Austrochip 2006 conference

Committee Memberships

- 2020 TPC Euromicro DSD/SEAA
2019– TPC Design, Automation and Test in Europe (DATE)
2019 TPC International Conference on Intelligent Systems and Applications (INTELLI)
2019 TPC IEEE International Conference on Embedded Software and Systems (ICESS)
2018 TPC Conference on Design of Circuits and Integrated Systems (DCIS)
2018– TPC IEEE Int. Conf. on Emerging Technologies and Factory Automation (ETFAs)
2014– AdCom IEEE/ASME Int. Conf. on Mechatronic & Embedded Systems & Applications (MESA)
2011-2016 AdCom Conference on Advances in Circuits, Electronics and Micro-electronics (CENICS)
2011 TPC Software Language Engineering for Cyber-physical Systems at INFORMATIK (WS4C)
2008-2013 ExCom IEEE/ASME Int. Conf. on Mechatronic & Embedded Systems & Applications (MESA)
2008, 2016– TPC IEEE Int. Symp. on Industrial Embedded Systems (SIES)
2008-2016 TPC Int. Conf. on Advances in Electronics and Micro-electronics (CENICS)
2006– TPC IEEE/ASME Int. Conf. on Mechatronic & Embedded Systems & Applications (MESA)
2000– TPC Austrochip

Reviewing

- 2019– Design, Automation and Test in Europe (DATE)
2018– IEEE Embedded Systems Letters
2017– MDPI Sensors
2011– IFAC Journal Automatica (Elsevier)
2010 National Science Foundation Canada
2010 Journal Quality and Reliability Engineering International (Wiley)
2009 IEEE Int. Symp. on Industrial Electronics (ISIE)
2008– IEEE Int. Symp. on Industrial Embedded Systems (SIES)
2008–2016 IEEE Int. Conf. on Advances in Electronics and Micro-electronics (CENICS)

- 2008– IEEE Transactions on Industrial Informatics
- 2007 Oxford Computer Journal (Oxford Univ. Press)
- 2007– International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE)
- 2006– ASME/IEEE Int. Conf. on Mechatronics & Embedded Systems & Applications (MESA)
- 2006 IEEE Transactions on Multimedia
- 2005 IEEE Int. Conf. on Intelligent Transport Systems (ITSC)

Other

- 2020– Experimental Results in Computer Science – Reviewing Editor (Cambridge University Press)
- 2020 AQ Austria – Chairing Reviewer for Academic Degree Programs
- 2019– Doctoral College Resilient Embedded Systems – Advisory Board
- 2016-2018 IEEE Austria Section – Financial Auditor
- 2006-2013 IEEE Austria Section – Membership Development Officer
- 2003-2005 Advisory board, FIT-IT “Embedded Systems”, Austrian ministry BM:vit

Academic Courses

University of Technology Vienna (TU Wien)

- 1998–2002 M. Horauer: *Microcomputer (Lecture)*, Electrical Engineering
- 1998–2002 M. Horauer, et al.: *Microcomputer (Laboratory)*, Electrical Engineering

University of Applied Sciences Technikum Wien

- 2019/20 M. Horauer, Ch. Fibich: *Programming*, Electronic Engineering
- M. Horauer, Ch. Fibich: *System Programming & Application Development*, Electronic Engineering
- M. Horauer, D. Widhalm: *Embedded Systems Software Design*, Electronic Engineering
- M. Horauer, M. Wenzl: *Embedded Software*, Embedded Systems
- M. Horauer, et al.: *Selected Topics in Embedded Systems*, Embedded Systems
- 2018/19 M. Horauer, Ch. Fibich: *Programming*, Electronic Engineering
- M. Horauer, Ch. Fibich: *System Programming & Application Development*, Electronic Engineering
- M. Horauer, R. Beneder: *Embedded Systems Software Design*, Electronic Engineering
- M. Horauer, R. Beneder: *Embedded Systems Engineering*, Electronic Engineering
- M. Horauer: *Embedded Software Verification*, Embedded Systems
- M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2017/18 M. Horauer: *Programming*, Electronic Engineering
- M. Horauer, *System Programming & Application Development*, Electronic Engineering
- M. Horauer, R. Beneder: *Embedded Systems Software Design*, Electronic Engineering
- M. Horauer, R. Beneder: *Embedded Systems Engineering*, Electronic Engineering
- M. Horauer: *Embedded Software Verification*, Embedded Systems
- M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2016/17 M. Horauer: *Programming*, Electronic Engineering
- M. Horauer, *System Programming & Application Development*, Electronic Engineering
- M. Horauer, R. Beneder: *Embedded Systems Software Design*, Electronic Engineering
- M. Horauer, R. Beneder: *Embedded Systems Engineering*, Electronic Engineering
- M. Horauer: *Embedded Software Verification*, Embedded Systems
- M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems

- 2015/16 M. Horauer: *Programming*, Electronic Engineering
M. Horauer, *System Programming & Application Development*, Electronic Engineering
M. Horauer, R. Beneder: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, R. Beneder: *Embedded Systems Engineering*, Electronic Engineering
M. Horauer: *Embedded Software Verification*, Embedded Systems
M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2014/15 M. Horauer: *Programming*, Electronic Engineering
M. Horauer, *System Programming & Application Development*, Electronic Engineering
M. Horauer, R. Beneder: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, R. Beneder: *Embedded Systems Engineering*, Electronic Engineering
M. Horauer, *Scientific Work*, Electronic Engineering
M. Horauer, M. Kramer: *Platform Design & Verification*, Embedded Systems
M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2013/14 M. Horauer: *Programming*, Electronic Engineering
M. Horauer, *System Programming & Application Development*, Electronic Engineering
M. Horauer, R. Beneder: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, R. Beneder: *Real-Time Systems*, Electronic Engineering
M. Horauer, *Scientific Work*, Electronic Engineering
M. Horauer, M. Kramer: *Platform Design & Verification*, Embedded Systems
M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2012/13 M. Horauer: *C-Programming & System-Programming*, Electronic Engineering
M. Horauer, M. Zauner: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, M. Zauner: *Real-Time Systems*, Electronic Engineering
M. Horauer: *Selected Topics in EECS*, Embedded Systems
M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2011/12 M. Horauer: *C-Programming & System-Programming*, Electronic Engineering
M. Horauer, M. Zauner: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, M. Zauner: *Real-Time Systems*, Electronic Engineering
M. Horauer: *Selected Topics in EECS*, Embedded Systems
M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2010/11 M. Horauer: *C-Programming & System-Programming*, Electronic Engineering
M. Horauer, M. Zauner: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, M. Zauner: *Real-Time Systems*, Electronic Engineering
M. Horauer: *Selected Topics in EECS*, Embedded Systems
M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2009/10 M. Horauer: *C-Programming & System-Programming*, Electronic Engineering
M. Horauer, M. Wimmer: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, M. Wimmer: *Real-Time Systems*, Electronic Engineering
M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2008/09 M. Horauer: *C-Programming & System-Programming*, Electronic Engineering
M. Horauer: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, et al.: *Embedded Systems Project*, Embedded Systems
- 2007/08 M. Horauer: *C-Programming & System-Programming*, Electronic Engineering
M. Horauer: *Embedded Systems Software Design*, Electronic Engineering
M. Horauer, M. Kramer: *Real-Time Operating Systems*, Electronic Engineering
M. Horauer: *Embedded Systems Project*, Embedded Systems
- 2006/07 M. Horauer, R. Höller: *Digital System Design*, Electronic Engineering
M. Horauer: *C-Programming & System-Programming*, Electronic Engineering
- 2005/06 M. Horauer, et al.: *Digital System Design 1 & 2*, Electronic Engineering
M. Horauer, R. Höller, P. Rössler: *Digital System Design 1 & 2*, Electronic/Business

- M. Horauer: *System-Programming*, Electronic Engineering
M. Horauer, et al.: *Embedded Systems Project*, Electronic Engineering
M. Horauer, et al.: *Electronic Project*, Electronic Engineering
2004/05 M. Horauer, P. Balog: *Embedded Systems 1 & 2*, Electronic Engineering
M. Horauer, R. Höller: *Digital System Design 1 & 2*, Electronic Engineering
P. Balog, M. Horauer: *Embedded Systems*, Information & Communication Systems
M. Horauer, et al.: *Electronic Project*, Electronic/Business
M. Horauer, et al.: *Electronic Project*, Electronic Engineering
2003/04 M. Horauer, P. Balog, R. Höller: *Electronic Design 3 & 4*, Electronic
M. Horauer, P. Balog: *Distributed Systems*, Electronic Information Services
Th. Galla, M. Horauer: *Operating Systems*, Mechatronics & Robotics
2002/03 M. Horauer, P. Balog, R. Höller: *Electronic Design 3 & 4*, Electronic
M. Horauer, et al.: *Computer & System Techniques*, Electronic
M. Horauer, et al.: *Embedded Systems*, Electronic Information Services
M. Horauer, P. Balog: *Distributed Systems*, Electronic Information Services
2001/02 M. Horauer, P. Balog, and Ch. Kollmitzer: *Electronic Design 3 & 4*, Electronic
M. Horauer, et al.: *Computer & System Techniques*, Electronic
M. Horauer, H. Newald: *Electronic Design 3 & 4*, Electronic/Business
M. Horauer: *Embedded Systems*, Electronic Information Services
M. Horauer, P. Balog: *Distributed Systems*, Electronic Information Services
2000/01 P. Balog, M. Horauer, and Ch. Kollmitzer: *Electronic Design 3 & 4*, Electronic
M. Horauer, H. Newald: *Electronic Design 3 & 4*, Electronic/Business
1999/00 P. Balog, M. Horauer, and Ch. Kollmitzer: *Electronic Design 3 & 4*, Electronic Engineering

Guest Lectures, Short-term Courses, Stays Abroad

- 2018 “Introduction to Model-Checking”, lecture at the Technological Educational Institute of Eastern Macedonia & Thrace, Kavala, Greece
2013 “Introduction to FlexRay”, lecture at the University Budapest, Hungary
2011 “Microcontroller Workshop”, lecture at the T.E.I. of Kavala, Greece
2011 “Embedded Linux”, ÖVE/OGMA PI-Seminar for HTL-Teachers
2010 “Introduction to FlexRay”, lecture at the T.E.I of Kavala, Greece
2009 “Automotive Communication Systems”, lecture at the University of Koblenz-Landau, Germany
2002 “Real-Time Operating Systems”, lectures at the Polytechnic Tornio-Kemi, Finland
2002 “Controller Area Network”, ÖVE/OGMA PI-Seminar for HTL-Teachers
2001 “Microprocessor Architectures”, Seminar for Austro Control GmbH
1996 “VHDL”, Course held at the University of Technology Vienna

Memberships

Senior Member IEEE, ASME, ÖVE