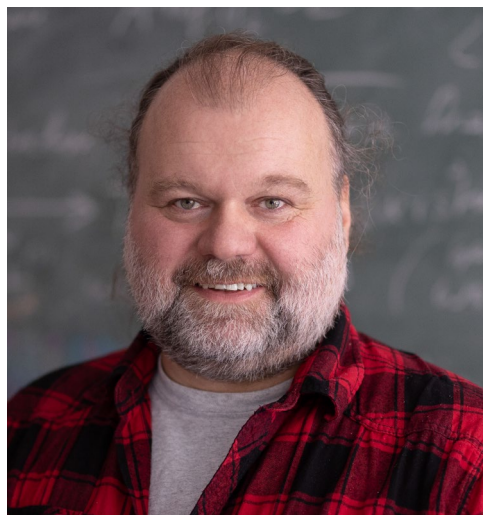


Peter Balazs

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Curriculum Vitae

Scientific Interests:

My vision is bridging (deep theoretical) mathematics to more applied scientific topics. I am passionately committed to **application-oriented mathematics for acoustics and signal-processing**. This allows the full usage of mathematical rigor and controllability of parameters for models and methods in the applied sciences on one hand. On the other hand this creates new mathematical topics and concepts, raises novel questions within mathematics that are interesting and inspiring per-se.

I am particularly interested in frame theory (discrete and continuous; in Hilbert and Banach spaces), operator theory (multipliers and the representation of operators) and time-frequency analysis (adaptive and adapted transforms; as well as phase-aware processing). My approaches are connected to numerical linear algebra (efficient open science implementations for frame representations; convex optimization), signal processing (inpainting, filter banks and denoising), numerical acoustics (BEM /FEM), mathematical physics (coherent states), psychoacoustics (adaptation of time-frequency representations to biological auditory systems), acoustical measurements and simulations (related to spatial hearing and vocal tracts), bioacoustics (methods of mice ultrasound vocalizations) and machine-learning (deep neural networks).

Education

2001	MSc in mathematics with distinction at Univ. Vienna. Thesis: <i>“Polynomials over Groups”</i> . Advisor. Prof. G. Kowol
2005	PhD in mathematics with distinction at Univ. Vienna. Thesis: <i>“Regular and irregular Gabor frame multipliers with application to psychoacoustical masking”</i> . Advisor: Prof. H. G. Feichtinger
2011	Venia Legendi (Habilitation) in mathematics at Univ. Vienna. Thesis: <i>“New Concepts in Frame Theory Motivated by Acoustical Applications”</i>

Awards

2003	<i>“Stipendium für kurzfristiges wissenschaftliches Arbeiten”</i> (grant of the University of Vienna for scientific work abroad)
2004	<i>“Top-Stipendium des Landes Niederösterreich”</i> (grant from Lower Austria for best students)
2005	<i>“Leistungs-Stipendium”</i> (University of Vienna; performance scholarships, recognition of extraordinary achievements of students)
2009	short-listed for the <i>“Best Paper Award 2008”</i> of the Austrian Academy of Sciences
2011	<i>“Anerkennungspreis für Wissenschaft durch das Land Niederösterreich”</i> (Recognition Award for Scientists from Lower Austria)

2011	START-price (see Funding ID)
2012	IEEE senior member grade

Professional Experience

1999 – 2002	Software Developer at the <i>Acoustics Research Institute</i> (ARI) (C++, MFC, XML)
2002 – 2005	PhD research position at ARI, the <i>Laboratoire d'Analyse Topologie et Probabilités</i> (LATP), Université de Provence, and the <i>Laboratoire de Mécanique et d'Acoustique</i> (LMA), CNRS Marseille, France, with the European Union Network HASSIP (Nov. 2003 – Apr. 2004)
Aug. 2005	PostDoc research position at <i>Unité de physique théorique et de physique mathématique (FYMA)</i> , UCL Louvain-la-Neuve, Belgium
2005 – 2008	PostDoc research position at ARI
March, Mai and June 2006	PostDoc research position at the LATP, Université de Provence and the LMA, CNRS Marseille, France, with the European Union Network HASSIP
2008 – 2012	Senior research position at ARI: founding head of work-group “Mathematics and Signal Processing in Acoustics”
2008 – 2017	Several months parental part-time leave for three kids.
2012 – 2017	Member of the board of the IDK (political body for the directors of institutes within the Austrian Academy of Sciences)
2012 – present	Director of ARI (research institute with currently 65 members)

Supervision

In several third-party funding projects 13 PostDoc were employed and guided (F. Jaillet, M. Dörfler, D. Stoeva, T. Necciari, N. Holighaus, P. Søndergaard, D. Bayer, Z. Průša, G. Chardon, F. Huang, D. Abreu, M. Shamsabadi, K. Schrempf).

The following theses were done under my supervision:

2007	G. Toupin, “ <i>Development of software applications for psychoacoustic experiments</i> ”, Ecole Centrale Nantes (Master , co-advisor, finished 25.09.2007)
2006 – 2010	T. Necciari, “ <i>Masquage Auditif Temps-Fréquence: mesures psychoacoustiques et application à l'analyse-synthèse de sons</i> ”, Université de Provence, Marseille. (PhD , co-advisor and jury-member, <i>defense</i> 25.10.2010, passed with distinction)
2008 – 2011	M. Liuni, “ <i>Adaptive Sound Analysis and Synthesis</i> ”, University of Florence and IRCAM Paris (PhD , co-advisor, reviewer and jury member, <i>defense</i> 09.03.2012, passed with distinction)
2007 – 2016	N. Engelputzeder, “ <i>Linear time-variant Systems and Gabor Riesz bases</i> ”, University of Vienna (PhD , co-advisor, reviewer and jury member, <i>defense</i> 19.02.2016)
2013	M. Speckbacher. “ <i>Time-frequency representation adapted to perception</i> ”, Technische Universität München (Master , supervisor, finished 27.9.2013; passed with distinction)
2013 – 2014	N. Bachmann, “ <i>Complete Bessel sequences</i> ”, University of Vienna (Master , advisor and jury member, passed with distinction 24.07.2014)
2014 - 2017	M. Speckbacher, “ <i>Reproducing pairs and flexible time-frequency representations</i> ”, University of Vienna (PhD , advisor, passed with distinction: 21.09.2017)
2011 - now	several internships ('stage'), reports and exams; Université Paris Diderot, Paris 7
2019	A. Nieto-Berezhinskaya, “ <i>Analyse and reproduction of the Laurel Yanny acoustic Illusion</i> “, University of Vienna (Bachelor ; co-advisor: W. Kreuzer)

2019	A. Fleisch, “ <i>Acoustic factors of looming perception</i> ”, University of Vienna (Bachelor ; co-advisor: R. Baumgartner)
2019	A. Aigner, “ <i>Anwenden eines unterbewussten absoluten Gehörs mit Hilfe von musikalisch einprägsamen Melodien</i> ”, University of Vienna (Bachelor ; co-advisor: M. Hoeschele)
2016 - now	D. Reitschmidt, “ <i>Adaptive functions of courtship ultrasonic vocalizations in male mice</i> ”, VetMedUni Vienna, first advisor: D. Penn (PhD ; co-advisor; main advisor: D. Penn)
2016 - now	M. Marconi, “ <i>Mechanisms of ultrasonic vocalizations in house mice</i> ”, VetMedUni Vienna, first advisor: D. Penn (PhD ; co-advisor; main advisor: D. Penn)
2019	D. Haider, “ <i>Aspects of Time-Frequency Scattering and Towards Phase Scattering</i> ”, University of Vienna (Master , advisor, passed: 14.11.2019)
2017 – now	S. Rajbamshi, “ <i>Time-Frequency Methods for Signal Reconstruction and Compressed Sensing with Applications in Audio</i> ”, Technical University Vienna (PhD ; advisor)
2019 - 2021	L. Köhldorfer, “ <i>Fusion Frames and Operators</i> ”, University Vienna (Master ; advisor; passed with distinction)
2020 – now	D. Haider, “ <i>Invertible Modeling in a Deep Learning Setting Using Frame Theory</i> ”, University Vienna (PhD ; advisor)
2021 – now	A. Lamando, “ <i>Regular-Adaptive Gabor Frames and Hilbert C^*-Modules</i> ”, University of Vienna (PhD ; advisor together with H.G. Feichtinger)
2021 – now	R. Abassi, “ <i>Developing a bioacoustic tool for mice vocalizations inspired by speech recognition algorithms</i> ”, University of Vienna (PhD ; advisor together with M. Grosse-Wentrup)
2021 - now	D. Bytchenkoff, “ <i>Tensor Product of Localized Frames (preliminary title)</i> ”, University of Vienna (PhD , advisor)
2021 – now	L. Köhldorfer, “ <i>Localized, Fusion and Tensors of Frames</i> ”, University of Vienna (PhD , advisor, together with K. Gröchenig)
2021 – 2022	J. Holböck, “ <i>Localized Frame</i> ”, University of Vienna (Master , advisor; passed with distinction: 22.09.2022)

Funding ID

All grants focus on the link between the mathematical frame theory, the signal processing algorithms, their implementations, and the acoustical applications.

2006 – 2007	Project leader WTZ project (AMADEUS) “ <i>Time-Frequency Representation and Perception</i> ”, cooperation with the LMA, CNRS Marseille. (5.950,- Euro)
2008 – 2011	Principal applicant and project leader WWTF project for High Potentials : “ <i>Frame Multipliers: Theory and Application in Acoustics (MulAC)</i> ” (425.000,- Euro)
2011 – 2013	Project leader WTZ project “ <i>Shift Invariant Spaces and their applications to Audio Signal Processing</i> ”, cooperation with the Department of Mathematics, University of Buenos Aires. (5.500,- Euro)
2011 – 2013	Co-applicant FWF Lise-Meitner project “ <i>Time-Frequency Implementation of HRTF</i> ” (principal applicant: D. Marelli, together with P. Majdak) (128.120,- Euro)
2012	Co-applicant ESI special semester “ <i>Modern Methods of Time-Frequency Analysis</i> ” (principal applicants: H. G. Feichtinger and K. Gröchenig) (86.400,- Euro in total)
2012 – 2020	Principal applicant and project leader START project “ <i>Frames and Linear Operators for Acoustical Modelling and Parameter Estimation</i> ” (FLAME) (1.197.970,- Euro)

2013 – 2014	Co-applicant WTZ project “ <i>Novel methods of completing missing samples in audio signals</i> ”, cooperation with NuHAG, Faculty of Mathematics, University of Vienna and . Brno University of Technology, Vysoké učení technické (project leader: Monika Dörfler) (5.600,- Euro in total)
2013 – 2014	Co-applicant WTZ project “ <i>Frame Theory for Sound Processing and Acoustic Holophony</i> ”, cooperation with Institute for Research and Coordination in Acoustics and Music (IRCAM), Paris, France (project leader: Diana Stoeva) (5.920,- Euro)
2013 – 2019	Co-applicant WWTF project “ <i>Computational harmonic analysis of high-dimensional biomedical data</i> ”(CHARMED), (project leader: Martin Ehler; call "Vienna Research Groups for Young Investigators Call 2012 Mathematics and ...") (1.500.000,- Euro in total)
2013 – 2016	Co-applicant FWF DACH project " <i>Adaptive Wavelet and Frame technique for acoustic BEM. Boundary Integral Operator Solution Techniques with Optimal Properties</i> " (BIOTOP); (project leader: Wolfgang Kreuzer; cooperative project with Germany and Switzerland) (340.651,50 Euro)
2014 – 2017	Co-applicant FWF-ANR project " <i>Perceptual optimization of time-frequency audio representations and coding</i> " (POTION) (project leader: Piotr Majdak; cooperative project with France) (237.174,- Euro)
2015 – 2016	Project Leader WTZ project (CZ 01/2015) “ <i>Modern methods for the restoration of digital audio signals</i> ”, cooperation with Brno University of Technology, Vysoké učení technické (5.812,- Euro)
2017 – 2021	Co-Principal Investigator WWTF project “ <i>Infinite Dimensional Signal Processing Techniques for Acoustic Applications (INSIGHT)</i> ”, (principal investigator: Georg Tauböck; call: Mathematics and 2016) (623.200,- Euro)
2017 – 2020	Co-applicant FWF-GACR project “ <i>Modern methods for the Restoration of lost information in digital signals – MERLIN</i> ”, cooperation with Brno University of Technology, Vysoké učení technické (Project leader Nicki Holighaus) (338.218,65,- Euro)
2018 – 2020	Project Leader WTZ project (SRB 01/2015) “ <i>ANACRES – Analysis and Acoustics Research</i> ”, cooperation with Faculty of Sciences, University of Novi Sad (7.000,- Euro)
2020 - 2022	Project Leader OeAW Innovations Project “ <i>FUn – Frames and Unbounded Operators</i> “. (140.400,- Euro)
2021 - 2024	Project Leader FWF project “ <i>Localized, Fusion and Tensors of Frames</i> ”, cooperation w. K. Gröchenig, University of Vienna (398.412,- Euro)
2021 – 2025	Co-applicant FWF project “ <i>Nonsmooth Nonconvex Optimization Methods in Acoustics</i> ”, project leader: Prof. Radu Bot (University of Vienna) (402.402,- Euro)

Major National and International Collaborations

In my experience a broad and reliable network of scientists is essential for an efficient research environment. My current network contains the following scientists:

H. G. Feichtinger, K. Gröchenig (Univ. Vienna)	Numerical harmonic analysis, Gabor theory.
J. P. Antoine (Univ. Cath. Louvain-la-Neuve)	Discrete and continuous frames, with connection to mathematical physics.
R. Kronland-Martinet, S. Ystad (LMA, CNRS Marseille)	Sound synthesis, signal processing and psychoacoustical masking.
B. Torrèsani (LATP, Univ. Provence) P. Søndergaard (Oticon Denmark)	Practical time-frequency analysis, the Linear Time Frequency Analysis Toolbox (LTFAT) and psychoacoustical masking.

H. Harbrecht (Univ. Basel), S. Dahlke (Univ. Marburg)	Adaptive Wavelet and Frame techniques
A. Arefijamaal (Univ. Sabzevar), A. Rahimi (Univ. Maragheh)	Frame Theory

Invited Visits

September 2006	LATP, Université de Provence, Marseille, France
August 2007	LTS2, Signal Processing Institute, EPFL Lausanne, Switzerland
October 2007	Centre for Applied Hearing Research (CAHR), Technical University of Denmark
November 2007	FYMA, UCL Louvain-la-Neuve, Belgium
2008 – 2011	(several) LATP, Université de Provence and LMA, CNS, both Marseille; as well as FYMA, UCL Louvain-la-Neuve (within the MulAc project)
December 2011	Centre for Applied Hearing Research (CAHR) , Technical University of Denmark
February 2014	The Norbert Wiener Center, University of Maryland
November 2016	Research Group of Computational Mathematics, University Basel
April 2018	Mathematical Institute of Serbian Academy of Science and Arts; Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad, Serbia
November 2022	Università degli Studi di Palermo

Workshop Organization / Special Sessions

2005	International workshop “ <i>HASSIP workshop: Application Of Time Frequency Analysis In Acoustics</i> ”, at ARI
2007	Scientific exchange meeting: “ <i>NuHAG meets ARP</i> ”
2008 – 2011	5 international workshops within the MulAC project (see http://www.kfs.oeaw.ac.at/mulac)
2012 – 2014	Kickoff and midterm workshop of the FLAME project
2012	Workshop “ <i>Time-frequency methods for the applied sciences</i> ” within the “ESI12- Modern Methods of Time-Frequency Analysis II”-special semester.
2014	Special Session “ <i>Dictionary-based processing of single- and multi-channel audio</i> ” at ICASSP 2014 (together with A. Röbel, M. Liuni)
2016	International conference: “ <i>Strobl16 – Time-Frequency Analysis and Related Topics</i> ” (together with H.G. Feichtinger, K. Gröchenig and T. Strohmer)
2017	Special Session “ <i>Spectral Estimation and Acoustics</i> ” at SAMPTA2017 – Sampling Theory and Applications, 12th International Conference (together with L.D. Abreu); technical committee.
2017	Special Session “ <i>Modern Mathematical Methods for Signal Processing in Audio and Acoustics</i> ” at 13th International Conference on Theoretical and Computational Acoustics (ICTCA2017) (together with G. Tauböck)
2018	Main organizer of international conference: “ <i>Strobl18 – Harmonic Analysis and Applications</i> ” (together with H.G. Feichtinger, K. Gröchenig, M. Ehler and T. Strohmer)
2019	OeAW AI fair (machine learning Hackathon and workshop)
2019	Special Session “ <i>Time-frequency Analysis and Applications</i> ” at the 12 th ISAAC Congress (together with D. Abreu)

2019	Special Session “ <i>Acoustical Signal Processing in biological systems: Mathematical Methods and Algorithms</i> ” at the 23 rd International Congress on Acoustics (together with H. Führ)
2019	Special Session “ <i>Frames and PDEs</i> ” at the 14th International Conference on Mathematical and Numerical Aspects of Wave Propagation (together with H. Harbrecht)
2019	Co-director and organizer for OeAW AI Summer School
2020	Main organizer of international conference: “ <i>Strobl20 – Applied Harmonic Analysis and Friends</i> ” (together with H.G. Feichtinger, K. Gröchenig, M. Ehler and T. Strohmer) (canceled due to corona)
2020-2022	Co-organizer of DAFx 20, Vienna (virtual); DAFX20in21 (virtual), DAFX20in22
2021	Main organizer of DAGA 2021, Vienna (Organization committee and co-chair; the biggest conference for German-speaking acousticians)
2021	<i>Mathematics for Signals, Images and Structured Data</i> ; Mathematics for Audio and Music Signal Processing, CIRM Marseille (Scientific Committee; held as a short hybrid research school)
2022	Main organizer of international conference: “ <i>Strobl22 – Applied Harmonic Analysis and Friends</i> ” (together with K. Gröchenig, M. Ehler and T. Strohmer)

Invited / plenary talks:

2003 – 2018	33 invited talks at workshops, seminars, etc.
2016	Keynote talk at the 19th International Conference on Digital Audio Effects, DAFX-16, Brno, Czech Republic.
2019	Plenary talk at the International Conference on Mathematical Methods in Physics, Marakech, Morocco.
2019	Invited Speaker at the International Workshop on Frames, Wavelets, Approximation Methods and Applications, Palermo, Italy.
2020, 2022	Invited Speaker at the 8th International Conference on Computational Harmonic Analysis (ICCHA 2020) Munich (shifted due to Covid.)
2020, 2022	Plenary speaker at the 70th Annual Meeting of the Austrian Physical Society ÖPG (shifted due to Corona)
2020, 2022	Invited talk at the session “operator algebras and functional analysis methods for applications” of the International Conference in Functional Analysis, Approximation Theory and Numerical Analysis (shifted due to Corona.)
2021	Invited Tutorial Speaker “Redundante Darstellung mit Rahmen“, DAGA 2021 – 47. Jahrestagung für Akustik
2021	Invited talk “Continuous frames in tensor product Hilbert spaces”, Operators, generalized functions and related topics, 21. - 24. September 2021, Novi Sad, Serbia

Services to the research community:

Editor	Sampling Theory, Signal Processing, and Data Analysis (Editor); Sahand Communications in Mathematical Analysis (Editor), Special Issue ‘ Harmonic Analysis and Applications ’, Journal Axioms (MDPI) Special Issue ‘ Advancements in Digital Audio Effects ’, Journal of the Audio Engineering
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	Society Special Issue 'New Trends in Audio Effects', Journal of the Audio Engineering Society Special Issue ' Harmonic Analysis and Applications ', Sampling Theory, Signal Processing, and Data Analysis
Journal Reviews	<i>Applied and Computational Harmonic Analysis, Journal of Mathematical Analysis and Applications, Journal of Fourier Analysis and Applications, Mathematische Nachrichten, Linear Algebra and its Applications, Advances in Computational Mathematics, Springer Plus, Numerical Functional Analysis and Optimization, Linear and Multilinear Algebra, Journal of Mathematics and Music, Complex Analysis and Operator Theory, Bulletin of the Belgian Math. Society, Discussiones Mathematicae, Journal of Algebra and Applications, Results in Mathematics, Open Mathematics, Journal of Inequalities and Applications, Bulletin of the Korean Mathematical Society, Proceedings Mathematical Sciences, Banach Journal of Mathematical Analysis, Abstract and Applied Analysis, Arabian Journal of Mathematics, Applied Mathematics and Computation, Mathematica Slovaca, International Journal of Wavelets, Multiresolution and Information Processing, Bulletin of the Iranian Mathematical Society, Mediterranean Journal of Mathematics, The Journal of Nonlinear Sciences and Applications, Turkish Journal of Mathematics, Journal of the Korean Mathematical Society, Iranian Journal of Mathematical Sciences and Informatics, Hacettepe Journal of Mathematics and Statistics, Journal of Mathematical Analysis. Journal of Mathematical Extension, Sahand Communications in Mathematical Analysis, Mathematical Communications, Filomat, Methods of Functional Analysis and Topology, Axioms, Entropy, Afrika Matematika, Boletín de la Sociedad Matemática Mexicana, Journal of Sciences, Islamic Republic of Iran, Mathematical Reviews (AMS), Methods of Functional Analysis and Topology, Mathematical Methods in the Applied Sciences, International Journal of Mathematics and Mathematical Sciences, Ricerche die Matematica Advances in Mathematical Physics IEEE Transactions on Signal Processing, IEEE Transactions on Audio, Speech and Language Processing, IEEE transactions on Information Theory IEEE Signal Processing Letters, IEEE Journal of Selected Topics in Signal Processing, Sensors, Signal Processing. Journal of the Acoustical Society of America, The Journal of the Acoustical Society of America Express Letters, Journal of the Audio Engineering Society, Bioacoustics Scientific Reports</i>
Conference Reviews	<i>EUSIPCO08, SAMPTA09, ICMC 2012 (paper committee – PC), CMMR2013 (PC), ICASSP14 (track chair) EUSIPCO15 (technical committee – TC), SAMPTA15, MALSIP15 (TC), ICASSP16, EUSIPCO16 (TC), SPARS17, SAMPTA2017 (PC), DAFx2017, EUSIPCO2017, ICASSP2018, LVA-ICA2018, EUSIPCO2018, ICASSP2019, DAFx2019, DAFX 2020, ICASSP 2021, DAFx20in21, ICASSP 2022</i>
Book Proposal Reviews	<i>Cambridge University Press</i>
Funding Agency Reviews	<i>OEAD (WTZ), NSA (AMS)</i>

I consider the role of reviewers in the scientific community as very important and take this role very seriously. I am happy to be recognized for that. For example, I have received the following feedback on my review work: 'In our extensive research career, we have never come across such an adequate and helpful set of reviewers. [...] the review offered by reviewer 3 [me] stands out from the set of the three comprehensive reviews. [...] **In some sense, the major improvements with respect to the first version are mainly due to the large experience of the reviewer in the area, and his willingness to help.**' or from a more recent review '[...] we are deeply indebted to the referee for giving the paper considerable attention, resulting in a **significant improvement.**'

Languages

German: native tongue	English: fluent
Russian: 4 years at high school	French: basic knowledge

Scientific Membership

IEEE (Signal Processing Society)	Audio Engineering Society (AES)
Österreichische Mathematische Gesellschaft (ÖMG)	Europäische Mathematische Gesellschaft (EMG)
Deutsche Gesellschaft für Akustik (DEGA)	American Mathematical Society (AMS)
Gesellschaft für Angewandte Mathematik und Mechanik	International Commission for Acoustics (ICA – treasurer)

Teaching

2005	<i>Repetitorium zu Lineare Algebra und Geometrie I</i> (University of Vienna)
2008	<i>Ausgewählte Kapitel aus Harmonische Analysis</i> (University of Vienna, together with Hans G. Feichtinger, Ole Christensen)
2009	<i>Angewandte Mathematik für Lehramt</i> (University of Vienna, Proxy of Hans G. Feichtinger)
2011	<i>Lineare Algebra I</i> (University of Vienna, Proxy of Hans G. Feichtinger)
2011	<i>Übung: Angewandte Mathematik für LAK</i> (University of Vienna)
2013	<i>Übung: Lineare Algebra für PhysikerInnen</i> (University of Vienna)
2014	<i>Vorlesung und Übung: Lineare Algebra für PhysikerInnen</i> (University of Vienna)
2015	<i>Übung: Lineare Algebra für PhysikerInnen</i> (University of Vienna)
2017 - 2020	<i>Laboratory Acoustics</i> (University of Vienna)
2017, 2019, 2021	<i>Frame Theory</i> (University of Vienna)
2018, 2020, 2022	Seminar <i>Frame Theory</i> (University of Vienna)

Special skills / commitment

Computer	<p><i>Applications:</i> Anaconda, R Studio, MS Office, MS Visual Studio, Maple, MathCad, Matlab, SPSS and many others.</p> <p><i>Operating systems:</i> Windows (all up to Windows 10), DOS; basic knowledge of Unix, iOS.</p> <p><i>Programming languages:</i> excellent knowledge of C++ (plus MFC), Matlab; good knowledge of Visual Basic, Java, R, Python; basic knowledge of Fortran, Assembler and others.</p> <p>Working experience with HTML, XML and TeX</p>
Art	Commitment to the art club “ <i>Kunstwerkstatt Tulln</i> ” (1988-1996). 1996 president.
Baseball	Commitment to the baseball club “ <i>Ravens Tulln</i> ” for years (1999 - present), past member of its board, team player.

Other hobbies and interests

Music	playing the drums (teaching, giving performances and recording)
Sound engineer	experience as sound (and light) engineer
Sport	baseball, skiing, table soccer, volleyball, tennis, table tennis (in the past:) sailing, judo
Games	of all kinds, especially role-playing, computer, board and card games

Full Publication List:

I have authored or co-authored **60 peer-reviewed international journal papers**, as well as 6 book chapters, 39 peer-reviewed and 23 other proceedings publications.

Citations: 2894 (Google Scholar), 2520 (Research Gate), 1669 (Scopus), 1024 (Web of Science)

h-index: 30 (Google Scholar), 27 (Research Gate), 25 (Scopus), 20 (Web of Science).

For a current publication list with preprints and links to the journals see also

<http://www.balazs.at/wissenen.html>

Publications in peer-reviewed journals:

1. P. Balazs, H.G. Feichtinger, M. Hampejs, G. Kracher, "Double Preconditioning for Gabor Frames", **IEEE Transactions on Signal Processing**, Vol. 54 (12), pp. 4597-4610 (2006)
2. P. Balazs, "Basic Definition and Properties of Bessel Multipliers", **Journal of Mathematical Analysis and Applications**, Vol. 325 (1), pp. 571-585, (2007)
3. P. Majdak, P. Balazs, B. Laback, "Multiple Exponential Sweep Method for Fast Measurement of Head Related Transfer Functions", **Journal of the Acoustical Engineering Society**, Vol. 55, No. 7/8, pp. 623-637 (2007)
4. P. Balazs, W. Kreuzer, H. Waubke, "A stochastic 2D-model for calculating vibrations in random layers", **Journal of Computational Acoustics**, Vol. 15, No. 3, pp. 271-283 (2007)
5. P. Balazs, M. El-Gebeily, "A Systematic Study of Frame Sequence Operators and their Pseudoinverses", **International Mathematical Forum** 3, no. 5, pp. 229-239 (2008)
6. P. Balazs, "Matrix Representation of Operators Using Frames", **Sampling Theory in Signal and Image Processing**, Vol. 7, No. 1, pp. 39-54 (2008)
7. P. Balazs, "Hilbert-Schmidt Operators and Frames Classification, Approximation by Multipliers and Algorithms", **International Journal of Wavelets, Multiresolution and Information Processing**, Vol. 6, No. 2, pp. 315-330 (2008)
8. P. Balazs, "Frames and Finite Dimensionality: Frame Transformation, Classification and Algorithms", **Applied Mathematical Sciences**, Vol. 2, no. 41-44, pp. 2131-2144 (2008)
9. P. Balazs, B. Laback, G. Eckel, W. Deutsch, "Time-Frequency Sparsity by Removing Perceptually Irrelevant Components Using a Simple Model of Simultaneous Masking", **IEEE Transactions on Audio, Speech and Language Processing**, Vol. 18 (1), pp. 34-49 (2010)
10. D. Marelli, P. Balazs, "On Pole-Zero Model Estimation Methods Minimizing a Logarithmic Criterion for Speech Analysis" **IEEE Transactions on Audio, Speech and Language Processing**, Vol.18 (2), pp. 237-248 (2010)
11. P. Balazs, J.-P. Antoine, A. Gryboś, "Weighted and Controlled Frames: Mutual Relationship and First Numerical Properties", **International Journal of Wavelets, Multiresolution and Information Processing**, Vol. 8, pp. 109-132 (2010)
12. A. Rahimi, P. Balazs, "Multipliers for Banach p -Frames", **Integral Equations and Operator Theory**, Vol. 68 (2), 193-205, (2010)
13. W. Kreuzer, H. Waubke, G. Rieckh, P. Balazs, "A 3D Model to Simulate Vibrations in a Layered Medium with Stochastic Material Parameters", **Journal of Computational Acoustics**, Vol. 19 (2), pp.139-154 (2011)
14. B. Laback, P. Balazs, T. Necciari, S. Savel, S. Ystad, S. Meunier, R. Kronland-Martinet, "Additivity of auditory masking for short Gaussian-shaped sinusoids", **The Journal of the Acoustical Society of America**. Vol. 129, pp. 888-897 (2011)
15. P. Balazs, D. Stoeva, J.-P. Antoine, "Classification of General Sequences by Frame-Related Operators", **Sampling Theory in Signal and Image Processing**, Vol. 10 (1-2), pp. 151-170 (2011)

16. J.-P. Antoine, P. Balazs, "*Frames and Semi Frames*", **Journal of Physics A: Mathematical and Theoretical**, Vol. 44 (20) 205201 (2011)
17. P. Balazs, C. Cabrelli, S. Heineken, U. Molter, "*Frames by Multiplication*", **Current Development in Theory and Applications of Wavelets**, Vol. 5 (2-3), pp. 165-186 (2011)
18. P. Balazs, M. Dörfler, N. Holighaus, F. Jaillet, G. Velasco, "*Theory, Implementation and Application of Nonstationary Gabor Frames*", **Journal of Computational and Applied Mathematics**, Vol. 236 (6), pp. 1481-1496 (2011)
19. E. Enzinger, P. Balazs, "*Speaker Verification using Pole/Zero Estimates of Nasals*", **Analele Universitatii "Eftimie Murgu"**, Vol. 18 (2), pp. 33-44 (2011)
20. P. Balazs, G. Rieckh, "*Oversampling Operators: Frame Representation of Operator*", **Analele Universitatii "Eftimie Murgu"**, Vol. 18 (2), pp. 107-114 (2011)
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