

CURRICULUM VITAE



Surname: Kovtunenکو
First Name: Victor
Middle Name: Anatol'evich
Birth: July 21, 1966, Karaganda
Citizenship: Russia, Austria
Marital Status: Married, 3 children
Languages: Russian, German, English
SV Number: 6442 210766

Education: Novosibirsk State University,
Diploma in Applied Mathematics, 1990

Degrees:

- Candidate of Physical and Mathematical Sciences (PhD), 1994
- Docent (Associate Professor), 1998
- Doctor of Physical and Mathematical Sciences (Habilitation), 2007

Present Address

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Mendeley: <https://www.mendeley.com/profiles/victor-kovtunenکو/stats/?viewAsOther=true>

eLIBRARY.RU: https://elibrary.ru/author_items.asp

Publications: 2 dissertations, 2 books, 74 articles in journals
9 chapters in books, 9 proceedings, 6 non-refereed issues;
Participation: 104 conferences (62 contributions, 8 plenary/keynote lectures)
5 program/organizing committees, 7 coorganized minisymposiums
20 short-term visits (16 lectures), 1 activity group
Projects: 8 individual projects, 14 collaborative
Editorial: 3 editorial boards, referee for 2 theses, 3 foundations, 45 journals
Supervision: 1 PhD student

Research Interests

- Analysis: hemi/variational inequalities, shape/topology optimization
- Scientific computing: nonsmooth constrained optimization, GFEM
- Applications: singular/inverse/asymptotic problems, PDE, cracks

Scientific Career

- 1990– *Postgraduate*, 1993– *Junior Researcher*, 1995– *Researcher*, 1997–
Senior Researcher, 2020–present: *Leading Researcher*, Lavrent'ev
 Institute of Hydrodynamics, Siberian Division of the Russian
 Academy of Sciences, Novosibirsk, Russia
- 1994 : Diploma of Candidate of Physical and Mathematical Sciences
 (PhD), Moscow
- 1998–2000: *Research Fellow* of the Alexander von Humboldt Foundation,
 Mathematical Institute A, University of Stuttgart, Germany
- 2002–2004: *Lise Meitner Fellow* of the Austrian Science Fund (FWF),
- 2004–2005: *Senior Postdoc* of the Special Research Center (SFB) F003 "Op-
 timization and Control", University of Graz, Austria
- 2008 : Diploma of Doctor of Physical and Mathematical Sciences (Ha-
 bilitation), Moscow
- 2006–2012: *Project Leader*, Institute for Mathematics and Scientific Com-
 puting, University of Graz, Austria
- 2013–2014: *University Project Assistant* (1/2 Position), Institute for Sta-
 tistics, Graz University of Technology, Austria
- 2016–2018: *Senior Postdoc*, Austrian Academy of Sciences (ÖAW)
- 2014–2019: *Project Leader*, Institute for Mathematics and Scientific Com-
 puting, University of Graz, Austria
- 2021 : *Senior Postdoc*, European Research Council (ERC) Programme
 OCLOC, University of Graz, Austria

Individual Projects:

1. *Problems in solid mechanics with friction at a crack*, Grant of the
 Siberian Division of the Russian Academy of Sciences, 1997–1998
2. *Unilateral constrained problems with boundary singularities*, Advisor
 Prof. W.L. Wendland, Fellowship of the Alexander von Humboldt
 Foundation, Germany, 1998–2000
3. *Shape optimization approach to the propagation of cracks*, Advisors
 Prof. W.L. Wendland and Academician V.M. Titov, Fellowship YSF-
 01/33 of the INTAS Foundation, Belgium, 2001–2002
4. *Variational methods in application to crack problems*, Advisor Prof.
 K. Kunisch, Lise Meitner Fellowship M 622/ M 737 of the FWF, Aus-
 tria, 2002–2004

5. *Primal-dual constrained optimization and tribology of cracks*, Research Project P18267-N12 of the FWF, Austria, 2006–2009
6. *Topology optimization for cracks*, Research Project P21411-N13 of the FWF, Austria, 2009–2012
7. *Object identification problems: numerical analysis*, Research Project P26147-N26 of the FWF, Austria, 2014–2019
8. ÖAD Scientific & Technical Cooperation WTZ CZ 18/2020, Principal Investigators with G.A. Monteiro (Czech Academy of Sciences, Prague) 2020-2022

Collaborative Projects:

- Russian Foundation for Basic Research, Grant 96-01-01645, Project Leader I.Yu. Zvelodub, 1996–1998; Grants 97-01-00896, 00-01-00842, 03-01-00124, 06-01-00209, 10-01-00054 Projects Leader A.M. Khludnev, 1997–2012; Grant 18-29-10007, Project Leader E.M. Rudoy, 2020–2021
- Ministry of Education of the Russian Federation, Grant 2000.4.19, Project Leader A.M. Khludnev, 2000–2001
- Special Research Center (SFB) F003 ”Optimization and Control”, Austria, Speaker F. Kappel, 2004–2005
- INTAS Project 03-51-6046, Speaker H.-J. Christ (University of Siegen, Germany), 2005–2006
- FWF Research Project P24302, Leaders R. Tichy, I. Berkes (TU Graz), 2013–2014
- ÖAD Scientific & Technical Cooperation WTZ CZ 01/2016, Principal Investigators E. Bauer (TU Graz), P. Krejčí (Czech Academy of Sciences, Prague) 2016–2017
- RFBR - JSPS Joint Project 19-51-50004, Leaders E.M. Rudoy (Lavrent’ev Institute of Hydrodynamics), H. Itou (Tokyo University of Science), 2019–2020
- ERC under the European Union’s Horizon 2020 Research and Innovation Programme advanced grant 668998: ”From Open to Closed Loop Optimal Control of PDEs” (OCLOC), Leader K. Kunisch, 2021

Awards:

- *I.N. Vekua Prize*, Siberian Division of the Russian Academy of Sciences, 1995
- *State Fellowship for Young Scientists*, Russian Academy of Sciences, 1997–1998
- *Fellow of the Wessex Institute of Technology*, 2004
- *2nd most read article*, *Applicable Analysis*, 2015
- *IOP Outstanding Reviewer for Inverse Problems*, 2017

- *2nd most read article*, Math. Mech. Solids, 2018
- *Wiley top downloaded paper 2018–2019*, Math. Methods Appl. Sci.
- *Best Papers*, Math. Models Methods Appl. Sci., 2019, 2020

Editorial Boards:

- Abstract and Applied Analysis (Hindawi Publishing, Egypt), 2012–
<https://www.hindawi.com/journals/aaa/editors/>
- Technologies (MDPI, Switzerland), 2020–
<https://www.mdpi.com/journal/technologies/editors>
- Applications in Engineering Science (Elsevier, Netherlands), 2020–
<https://www.journals.elsevier.com/applications-in-engineering-science/editorial-board>

Referee of Theses:

O.V. Sadvskaya (PhD, Lavrent'ev Institute of Hydrodynamics, 01.01.2001)
V. Kulvait (PhD, Charles University in Prague, 1.09.2017)

Referee for Science Foundations:

National Science Centre in Poland (Narodowe Centrum Nauki - NCN);
Israel Science Foundation (ISF); Österreichischer Austauschdienst (OeAD)

Referee in Scientific Journals:

AIMS Commun. Pure Appl. Anal.; AIMS Discrete Cont. Dyn. Syst. Ser. S; AIP Conf. Proc.; Appl. Math.; Appl. Math. Opt.; Comm. Math. Sci.; Georgian Math. J., Int. J. Solids Struct.; Inverse Probl.; Inverse Probl. Sci. Eng.; Iranian J. Math. Sci. Inform.; J. Appl. Math.; J. Appl. Mech. Tech. Phys. (Prikl. Mekh. Tekhn. Fiz.); J. Appl. Numer. Optim.; J. Engineering Math.; J. Optim. Theory Appl.; Lecture Notes Appl. Comp. Mech.; Math. Comput. Simulat.; Math. Control Related Fields; Math. Mech. Solids; Math. Methods Appl. Sci.; Math. Nachrichten; Math. Programming; Math. Review; Mech. Adv. Materials Struct.; Numer. Funct. Anal. Optim.; Numerische Math.; Optimization; Optim. Meth. Software; Publ. Math. Debrecen; Quarterly Appl. Math.; SIAM J. Control Optim.; SIAM J. Numer. Anal.; SIAM J. Optimiz.; Siberian Electron. Math. Rep.; Siberian J. Industrial Math. (Sibirsk. Zh. Ind. Mat.); Siberian J. Numer. Math. (Sibirsk. Zh. Vych. Mat.); Siberian J. Pure Appl. Math. (Vestnik NGU); Siberian Math. J. (Sibirsk. Mat. Zh.); Springer Proc. Math. Stat.; Springer Ser. Math. Ind.; Technologies; TWMS J. App. Eng. Math.; Z. Angew. Math. Mech.; Z. Angew. Math. Phys.

Academic Career

- 1993–1994: *Assistant* (1/2 Position), Specialized Physical and Mathematical School at the Novosibirsk State University, Russia
- 1997–1998: *Assistant* (1/2 Position), Chair of Mathematics, Novosibirsk High Military School
- 1992–
1996–1998: *Associate Professor* (1/2 Position), Chair of Theoretical Mechanics, Novosibirsk State University
- 1995–1998: *Deputy Dean*, Department of Mathematics, Novosibirsk State University
- 1998 : *Diploma of Docent (Associate Professor)*, Moscow, Russia
- 2012–2016: *University Assistant* (2014: 1/2 Position), Institute for Mathematics and Scientific Computing, University of Graz, Austria
- 2019 : *University Assistant*, Institute of Analysis and Number Theory, Graz University of Technology, Austria
- 2019– : *University Assistant*, Institute for Mathematics and Scientific Computing, University of Graz, Austria

Courses Taught

at Novosibirsk State University and High Schools:

- *Elementary Mathematics*, basic course, seminars (1993-94)
- *Advanced Mathematics*, basic course, lectures and seminars (1997-98)
- *Theoretical Mechanics*, basic course, seminars (1992-93,95-98)
- *Calculus of Variations*, basic course, seminars (1994)
- *Nonlinear Problems of Solid Mechanics*, magister lectures (1998)

at Karl-Franzens University of Graz:

- *Partial Differential Equations*, seminars (SS09, SS10)
- *Mathematical Modeling*, seminars (SS10, SS11)
- *Introduction in Numerical Mathematics*, lectures (SS11)
- *Advanced Mathematics I,II*, seminars (WS12/13,SS13)
- *Scientific Computing*, lectures and seminars (WS12/13)
- *Optimization II*, seminars (SS13)
- *Analysis 1,2*, tutorial (SS14,WS14/15,SS15,WS15/16)
- *Analysis 1,2*, seminars (WS16/17,WS17/18,WS18/19,SS19)
- *Applied Mathematics*, magister seminar (WS16/17,WS17/18)
- *Advances in Applied Mathematics*, doctoral seminar (SS15,SS16, WS16/17,SS17,WS17/18,SS18,WS18/19,WS19/20,SS20, WS20/21,SS21)
- *Advanced Topics in Discrete Mathematics*, doctoral seminar (WS16/17)
- *Mathematics 1,2*, doctoral seminar (SS15,SS16,WS16/17,SS17, WS17/18,SS18,WS18/19,WS19/20,SS20,WS20/21,SS21)
- *Applied Mathematics*, bachelor seminar (SS17,SS18,SS20,SS21)
- *Numerics of Partial Differential Equations*, lectures (SS17,SS18,SS20),

seminars (SS20)

- *Nonlinear Optimisation*, lectures (WS20/21)

Supervision

2014–2019 *PhD*: Anna V. Buchynskaja (Zubkova) (graduated 6.03.2019)

Activities

2006– Activity group *Mathematical Aspects of Continuum Mechanics (MACM, former CoMFoS)* of the Japan Society for Industrial and Applied Mathematics (JSIAM)

Publications

PhD Thesis:

- [1] V.A. Kovtunenکو, *Numerical Solutions of Variational Inequalities for Contact Elastoplastic Problems*, Novosibirsk State University, 1994, 80pp. (in Russian)

Habilitation Thesis:

- [2] V.A. Kovtunenکو, *Variational Methods in Theory of Cracks with Constraints*, Novosibirsk, 2007, 371pp. (in Russian)

Books:

- [1] A.M. Khludnev and V.A. Kovtunenکو, *Analysis of Cracks in Solids*, International Series on Advances in Fracture Mechanics **6**, WIT-Press, Southampton, Boston 2000, 408pp, ISBN: 9781853126253.
- [2] H. Itou, S. Hirano, M. Kimura, V.A. Kovtunenکو and A.M. Khludnev (Eds.), *Mathematical Analysis of Continuum Mechanics and Industrial Applications III: Proceedings of the International Conference CoMFoS18*, Mathematics for Industry **34**, Springer, Singapore 2020, doi:10.1007/978-981-15-6062-0.

Articles in Journals:

- [1] V.A. Kovtunenکو, Convergence of solutions of variational inequalities in a contact problem for a plate with point constraints, in *Dinamika Sploshnoi Sredy* **103**, 55–64, Novosibirsk, 1991, ISSN: 0420-0497. (in Russian)
- [2] V.A. Kovtunenکو, An iterative method for solving variational inequalities in a contact elastoplastic problem using the penalty method, *Comput. Math. Math. Phys.* **33** (1993), 9, 1245–1249, Mi: zvmmf2671. (translated from *Zh. Vychisl. Mat. i Mat. Fiz.*)

- [3] V.A. Kovtunenکو, Numerical solution of a contact problem for an elastoplastic beam by the penalty method, in *Dinamika Sploshnoi Sredy* **109**, 27–33, Novosibirsk, 1994, ISSN: 0420-0497. (in Russian)
- [4] V.A. Kovtunenکو, Convergence of solutions of variational inequalities in the problem of the contact of a plate with a nonsmooth stamp, *Differential Equations* **30** (1994), 3, 452–456, Mi: de8327. (translated from *Differentsial'nye Uravneniya*)
- [5] V.A. Kovtunenکو, An iterative penalty method for variational inequalities with strongly monotone operators, *Siberian Math. J.* **35** (1994), 4, 735–738, doi:10.1007/BF02106616. (translated from *Sibirsk. Mat. Zh.*)
- [6] V.A. Kovtunenکو, Numerical method of solving the problem of the contact of an elastic plate with an obstacle, *J. Appl. Mech. Tech. Phys.* **35** (1994), 5, 776–780, doi:10.1007/BF02369560. (translated from *Prikl. Mekh. Tekhn. Fiz.*)
- [7] V.A. Kovtunenکو, Iteration penalty method for the contact elastoplastic problem, *Control Cybernet.* **23** (1994), 4, 803–808, ISSN: 03248569.
- [8] V.A. Kovtunenکو, Numerical solution of a contact problem for the Timoshenko bar model, *Izvestiya RAN. Mekhanika Tverdogo Tela* (1996), 5, 79–84, ISSN: 1934-7936. (in Russian)
- [9] V.A. Kovtunenکو, An iterative penalty method for a problem with constraints on the interior boundary, *Siberian Math. J.* **37** (1996), 3, 508–512, doi:10.1007/BF02104853. (translated from *Sibirsk. Mat. Zh.*)
- [10] V.A. Kovtunenکو, Solution of the problem for a beam with a cut, *J. Appl. Mech. Tech. Phys.* **37** (1996), 4, 595–600, doi:10.1007/BF02369739. (translated from *Prikl. Mekh. Tekhn. Fiz.*)
- [11] V. Kovtunenکو, Analytical solution of a variational inequality for a cutted bar, *Control Cybernet.* **25** (1996), 4, 801–808, ISSN: 03248569.
- [12] V. Kovtunenکو, Iterative approximations of penalty operators, *Numer. Funct. Anal. Optim.* **18** (1997), 3&4, 383–387, doi:10.1080/01630569708816766.
- [13] V. Kovtunenکو, Iterative penalty method for plate with a crack, *Adv. Math. Sci. Appl.* **7** (1997), 2, 667–674, ISSN: 1343-4373.
- [14] V.A. Kovtunenکو, Variational and boundary value problems in the presence of friction on the inner boundary, *Siberian Math. J.* **39** (1998), 5, 1060–1073, doi:10.1007/BF02672913. (translated from *Sibirsk. Mat. Zh.*)
- [15] V.A. Kovtunenکو, A.N. Leont'ev and A.M. Khludnev, Equilibrium problem of a plate with an oblique cut, *Appl. Mech. Tech. Phys.* **39**

- (1998), 2, 302–311, doi:10.1007/BF02468098. (translated from *Prikl. Mekh. Tekhn. Fiz.*)
- [16] V.A. Kovtunenکو, Solution of the problem of the optimal cut in an elastic beam, *Appl. Mech. Tech. Phys.* **40** (1999), 5, 908–916, doi:10.1007/BF02468476. (translated from *Prikl. Mekh. Tekhn. Fiz.*)
- [17] V.A. Kovtunenکو, Crack in a solid under Coulomb friction law, *Appl. Math.* **45** (2000), 4, 265–290, doi:10.1023/A:1022319428441.
- [18] M. Bach, A.M. Khludnev and V.A. Kovtunenکو, Derivatives of the energy functional for 2D-problems with a crack under Signorini and friction conditions, *Math. Meth. Appl. Sci.* **23** (2000), 6, 515–534, doi:10.1002/(SICI)1099-1476(200004)23:6<515::AID-MMA122>3.0.CO;2-S.
- [19] V.A. Kovtunenکو, Sensitivity of cracks in 2D-Lamé problem via material derivatives, *J. Appl. Math. Phys. (Z. angew. Math. Phys.)* **52** (2001), 6, 1071–1087, doi:10.1007/PL00001584.
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- [22] V.A. Kovtunenکو, Shape sensitivity of a plane crack front, *Math. Meth. Appl. Sci.* **26** (2003), 5, 359–374, doi:10.1002/mma.341.
- [23] V.A. Kovtunenکو, Shape sensitivity of curvilinear cracks on interface to non-linear perturbations, *J. Appl. Math. Phys. (Z. angew. Math. Phys.)* **54** (2003), 3, 410–423, doi:10.1007/s00033-003-0143-y.
- [24] V.A. Kovtunenکو, Invariant energy integrals for the non-linear crack problem with possible contact of the crack surfaces, *J. Appl. Maths. Mechs.* **67** (2003), 1, 99–110, doi:10.1016/S0021-8928(03)00021-2. (translated from *Prikl. Mat. Mekh.*)
- [25] I.I. Argatov, M. Bach and V.A. Kovtunenکو, Propagation of a mode-1 crack under the Irwin and Khristianovich-Barenblatt criteria, *Materials Science* **39** (2003), 3, 365–370, doi:10.1023/B:MASC.0000010741.06016.71. (translated from *Phys.-Chemical Mech. Materials*)
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- [27] M. Hintermüller, V.A. Kovtunenکو and K. Kunisch, The primal-dual

- active set method for a crack problem with non-penetration, *IMA J. Appl. Math.* **69** (2004), 1–26, doi:10.1093/imamat/69.1.1.
- [28] M. Hintermüller, V.A. Kovtunenکو and K. Kunisch, Semismooth Newton methods for a class of unilaterally constrained variational problems, *Adv. Math. Sci. Appl.* **14** (2004), 2, 513–535, ISSN: 1343-4373.
- [29] M. Hintermüller, V.A. Kovtunenکو and K. Kunisch, Generalized Newton methods for crack problems with non-penetration condition, *Numer. Methods Partial Differential Equations* **21** (2005), 3, 586–610, doi:10.1002/num.20053.
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- [31] V.A. Kovtunenکو, Interface cracks in composite orthotropic materials and their delamination via global shape optimization, *Optim. Eng.* **7** (2006), 173–199, doi:10.1007/s11081-006-6838-0.
- [32] V.A. Kovtunenکو, Primal-dual sensitivity analysis of active sets for mixed boundary-value contact problems, *J. Engineering Math.* **55** (2006), 151–166, doi:10.1007/s10665-005-9024-z.
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- [34] V.A. Kovtunenکو, Primal-dual methods of shape sensitivity analysis for curvilinear cracks with non-penetration, *IMA J. Appl. Math.* **71** (2006), 635–657, doi:10.1093/imamat/hxl014.
- [35] M. Hintermüller, V.A. Kovtunenکو and K. Kunisch, Constrained optimization for interface cracks in composite materials subject to non-penetration conditions, *J. Engineering Math.* **59** (2007), 3, 301–321, doi:10.1007/s10665-006-9113-7.
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- [39] V.A. Kovtunenکو, K. Kunisch and W. Ring, Propagation and bifurcation of cracks based on implicit surfaces and discontinuous velocities, *Comput. Visual Sci.* **12** (2009), 8, 397–408, doi:10.1007/s00791-008-0125-x.
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- [44] M. Hintermüller, V.A. Kovtunenکو and K. Kunisch, Obstacle problems with cohesion: A hemi-variational inequality approach and its efficient numerical solution, *SIAM J. Optim.* **21** (2011), 2, 491–516, doi:10.1137/10078299.
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- [46] V.A. Kovtunenکو and K. Kunisch, High precision identification of an object: optimality conditions based concept of imaging, *SIAM J. Control Optim.* **52** (2014), 1, 773–796, doi:10.1137/13091172X.
- [47] K. Fellner and V.A. Kovtunenکو, A singularly perturbed nonlinear Poisson–Boltzmann equation: uniform and super-asymptotic expansions, *Math. Meth. Appl. Sci.* **38** (2015), 16, 3575–3586, doi:10.1002/mma.3593.
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- [49] V.A. Kovtunenکو and G. Leugering, A shape-topological control of variational inequalities, *Eurasian Math. J.* **7** (2016), 3, 41–52, Mi: emj232.
- [50] K. Fellner and V.A. Kovtunenکو, A discontinuous Poisson–Boltzmann equation with interfacial transfer: homogenisation and residual error estimate, *Appl. Anal.* **95** (2016), 12, 2661–2682, doi:10.1080/00036811.2015.1105962.
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- estimates and stability, *Math. Meth. Appl. Sci.* **40** (2017), 6, 2284–2299, doi:10.1002/mma.4140.
- [52] H. Itou, V.A. Kovtunenکو and K.R. Rajagopal, Nonlinear elasticity with limiting small strain for cracks subject to non-penetration, *Math. Mech. Solids* **22** (2017), 6, 1334–1346, doi:10.1177/1081286516632380.
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Non-refereed Issues, Preprints:

- [1] V.A. Kovtunenکو, Boundary problems given in domains with thin inclusions, *Methodical research*, Novosibirsk State University, 1997, 23pp. (in Russian)
- [2] V.A. Kovtunenکو, Boundary problems on elasticity with boundary constraints, *Methodical research*, Novosibirsk State University, 1997, 31pp. (in Russian)
- [3] V.A. Kovtunenکو, Shape sensitivity of curvilinear cracks, *Newton Inst. Preprint Ser. NI99023-SMM*, Cambridge, 1999, 12pp.
- [4] M. Bach, V.A. Kovtunenکو and I.V. Sukhorukov, Numerical validation of the shape optimization approach to quasi-static crack propagation, *SFB404 Bericht* **2000/29**, Stuttgart University, 2000, 27pp.
- [5] M. Bach and V.A. Kovtunenکو, Numerics of quasistatic crack propagation and delamination of interface cracks. I. Mode-1 loading, *SFB404 Bericht* **2001/16**, Stuttgart University, 2001, 22pp.
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Conferences

- [1] *XXVIII International Scientific Student Conference*, Novosibirsk State

- University, Russia, 10–12.04.1990. (contribution)
- [2] *24 Regional Mathematical Youth Conference*, Ekaterinburg, Russia, 24–28.01.1993. (contribution)
- [3] Minisemester on *Parametric and Shape Optimization*, Banach Center, Warsaw, Poland, 8.03–9.04.1993. (contribution)
- [4] 13 Inter-regional Conference on *Numerical Methods for Solution of Elasticity and Plasticity Problems*, Novosibirsk, Russia, 22–24.06.1993. (contribution)
- [5] Siberian School-Seminar on *Mechanics*, Institute of Hydrodynamics, Novosibirsk, Russia, 12.1997. (contribution)
- [6] *Humboldt Colloquium*, St.Petersburg, Russia, 15–17.05.1998.
- [7] III Siberian Congress on *Industrial and Applied Mathematics (IN-PRIM)*, Novosibirsk, Russia, 22–27.06.1998. (poster "Problem of the solid with Coulomb friction on crack")
- [8] *Humboldt Introductory Meeting*, Bonn, Germany, 26–28.04.1999.
- [9] *Humboldt Annual Meeting*, Berlin, Germany, 31.5–1.06.1999.
- [10] *Humboldt Study Tour*, Germany, 16–28.08.1999.
- [11] Advanced Course on *Material Instabilities in Elastic and Plastic Solids*, International Centre for Mechanical Sciences (CISM), Udine, Italy, 13–17.09.1999.
- [12] International Conference on *Multifield Problems*, University of Stuttgart, Germany, 6–8.10.1999. (contribution "Sensitivity analysis of 2D-cracks in solids")
- [13] Workshop on *Models of Fracture*, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, 1–12.11.1999. (contribution "Sensitivity of cracks in 2D-elastic solids")
- [14] 6.GAMM/GACM Seminar on *Bruch- und Schädigungsmechanik*, University of Erlangen-Nürnberg, Germany, 9–10.03.2000. (contribution "Sensitivity of plane crack")
- [15] Conference on *Shape Optimization*, Institut Elie Cartan, Université Henri Poincaré, Nancy, France, 13–14.04.2000. (contribution "Shape optimization of crack form")
- [16] International Workshop on *3D-Singularities in Elasticity - Theory, Numerics, Applications*, University of Karlsruhe, Germany, 22–24.11.2000. (contribution "Shape optimization approach to quasi-static crack propagation")
- [17] Workshop on *Applied Mathematics*, University of Stuttgart, 12.10.2001.
- [18] Workshop on *Pseudodifferential Operators and Cracks*, University of

- Stuttgart, Germany, 16.10.2001.
- [19] Workshop on *The Treatment of Corners in Layered Structures (Plates and Composites)*, University of Karlsruhe, Germany, 18.12.2001. (contribution "Numerics of crack propagation in bonded solids")
 - [20] International Conference on *Multifield Problems*, University of Stuttgart, Germany, 8–10.04.2002. (**Section Chair**; contribution "Quasi-static propagation of cracks")
 - [21] 277.-WE Heraeus Seminar on *Contact and Fracture Problems*, Physikzentrum Bad Honnef, Germany, 27–29.05.2002. (contribution "Modelling of cracks and their quasistatic propagation")
 - [22] IV Brazilian Workshop on *Continuous Optimization*, IMPA, Rio de Janeiro, Brazil, 15–20.07.2002. (contribution "Shape sensitivity and optimization in crack problems")
 - [23] International Conference on *Scientific Computation and Differential Equations*, NTNU, Trondheim, Norway, 29.06–4.07.2003. (contribution "Shape optimization and computation of non-linear crack problems")
 - [24] 3rd Annual McMaster Optimization Conference: *Theory and Applications*, McMaster University, Hamilton, Ontario, Canada, 30.07–1.08.2003. (contribution "Shape optimization and inverse crack problems")
 - [25] Workshop on *Advances in Numerical Algorithms*, University of Graz, Austria, 10–13.09.2003.
 - [26] SIAM Conference on *Analysis of Partial Differential Equations*, Doubletree Hotel Houston-Post Oak, Houston, Texas, USA, 6–8.12.2004. (contribution "Primal-dual variational analysis of constrained problems with cracks")
 - [27] Annual Meeting of *Japan Society for Industrial and Applied Mathematics*, University of Tsukuba, Japan, 16–18.9.2006. (contribution "Optimization approach to quasi-static crack propagation")
 - [28] International Conference on *Differential Equation, Theory of Functions, and Applications (I.N.Vekua-100)*, Novosibirsk, Russia, 28.05–2.06.2007. (contribution "Nonlinear evolutionary problem for crack propagation")
 - [29] Inter-regional Conference on *Computational Mathematics*, Novosibirsk, Russia, 18–20.06.2007. (contribution "Numerical methods of optimization for crack problems")
 - [30] International Congress on *Industrial and Applied Mathematics (ICIAM 07)*, Zürich, Swiss, 16–20.07.2007. (**Co-organizer** of Minisymposium

on "Mathematical modeling and numerical analysis of fracture phenomena"; **Section Chair**; contribution "Optimization in constrained crack problems")

- [31] International Conference on *Inverse and Ill-Posed Problems of Mathematical Physics (M.M.Lavrentiev-75)*, Novosibirsk, Russia, 20–25.08.2007. (contribution "Inverse and optimization problems for cracks")
- [32] International Conference *ENUMATH-07*, Graz, Austria, 10–14.09.2007. (**Organizing Committee**; contribution "PDAS method for a hemivariational inequality")
- [33] Workshop on *Destruction: Mathematical Modeling of Tsunami Waves and Crack Propagation*, Keio University, Yokohama, Japan, 20–23.11.2007. (contribution "Problem of crack under quasibrittle fracture")
- [34] 7th CoMFoS Session on *Shape Optimization and Shape Sensitivity*, Hiroshima Kokusai Gakuin University, Japan, 25–27.11.2007. (**2 Lectures** on "Shape sensitivity of cracks")
- [35] International Workshop on *Advances in Shape and Topology Optimization*, University of Graz, Austria, 25–27.09.2008. (contribution "Shape optimization problems for cracks with contact and kink")
- [36] VIII Brazilian Workshop on *Continuous Optimization* celebrating A.Iusem's 60th birthday, Mambucaba-Rio de Janeiro, Brazil, 12–18.07.2009. (contribution "Semismooth methods for a hemivariational inequality")
- [37] Interdisciplinary Conference on *Chemical, Mechanical and Materials Engineering* with Virtual Participation (2009 ICCMME) Melbourne, Australia, 7–20.12.2009.
- [38] Workshop on *COMSOL Multiphysics*, Trend Hotel Europe Graz, Austria, 4.05.2010.
- [39] *Tag der Forschung*, Karl-Franzens University of Graz, Austria, 15.11.2010.
- [40] International Conference on *Applied Mathematics and Informatics* (ICAMI 2010), San Andres, Colombia, 28.11–3.12.2010. (**Program Committee; Organizer** of Minisymposium on "Topological Methods of Optimization, Application to Cracks"; **Section Chair**; contribution "On topological methods in crack problems")
- [41] 82nd Annual Meeting of *GAMM*, Graz, Austria, 18–21.04.2011. (**Section Chair**; contribution "On topological methods of optimization")
- [42] International SFB-Workshop on *Control and Optimization of PDES*, Bildungshaus Mariatrost, Graz, Austria, 10–14.10.2011.
- [43] Workshop on *Wave Propagation and Scattering, Inverse Problems and*

- Applications in Energy and the Environment* during Special Semester on Multiscale Simulation & Analysis in Energy and the Environment, Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, 21–25.11.2011. (poster "Variational methods for the identification of objects")
- [44] *Graz-Wien Bio-PDE day*, Karl-Franzens University of Graz, Austria, 8.05.2012. (contribution "High resolution identification of objects")
- [45] International SFB-Workshop on *Efficient Solvers in Biomedical Applications*, Bildungshaus Mariatrost, Graz, Austria, 2–5.07.2012.
- [46] International Colloquium on *Trends in Optimization and Control* on the occasion of the 60th birthday of K.Kunisch, Meerscheinschlössl, Graz, Austria, 21–22.09.2012.
- [47] *9th Austrian Numerical Analysis Day*, TU-Graz, Austria, 11–12.04.2013.
- [48] *NAWI Graz Informationsveranstaltung*, TU-Graz, Austria, 30.09.2013.
- [49] International Conference on *Applied Mathematics and Informatics* (ICAMI 2013), San Andres, Colombia, 24–29.11.2013. (**Program Committee; Section Chair; Plenary Lecture** "Topics in nonlinear optimization")
- [50] Workshop on *Mathematical Models in Biology*, Karl-Franzens University of Graz, Austria, 29.01.2014.
- [51] Conference on *Nonlinear Phenomena in Biology, Physics and Mechanics* in honour of Messoud Efendiev on the occasion of his 60th birthday, Helmholtz Zentrum Munich, Neuherberg, Germany, 3–7.03.2014 (**Plenary Lecture** "Nonlinear Poisson–Nernst–Planck systems: singular perturbation and homogenization").
- [52] Mini-Workshop on *Industrial Shape Optimization*, Graz University of Technology, Austria, 16.04.2014.
- [53] 7th International Conference on *Inverse Problems: Modeling & Simulation*, Ölüdeniz, Fethiye, Turkey, 26–31.05.2014 (contribution "Non-iterative identification of an object based on optimality conditions. Helmholtz problem").
- [54] International SFB-Workshop on *Imaging with Modulated/Incomplete Data*, Bildungshaus Mariatrost, Graz, Austria, 3–5.07.2014 (contribution "High precision identification of an object: optimality conditions based concept of imaging").
- [55] *10 years NAWI Graz*, Kasematten Schlossberg Graz, Austria, 10.07.2014.
- [56] 25 International Workshop on *Operator Theory and its Applications* (IWOTA 2014), VU University, Amsterdam, Netherlands, 14–18.07.2014 (contribution "Optimization theory in inverse problems of object identification: variational methods by inverse scattering").

- [57] International SFB-Workshop on *Modelling and Simulation in Biomechanics*, Bildungshaus Mariatrost, Graz, Austria, 15–17.09.2014.
- [58] 6. International Conference on *Computational Methods in Applied Mathematics*, BIFEB, St. Wolfgang, Austria, 28.9–4.10.2014 (contribution "A Petrov–Galerkin enrichment based generalized FEM: forward and inverse problems for Helmholtz equation").
- [59] Workshop on *Shape and Topological Optimization* during Special Semester on New Trends in Calculus of Variations, Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, 13–17.10.2014. (**Plenary Lecture** "Object identification based on optimality conditions. Helmholtz problem")
- [60] *8.Tag der Naturwissenschaftlichen Fakultät*, Karl-Franzens University of Graz, Austria, 28.11.2014.
- [61] Final Meeting on *Advanced 3D Fuel Cell Analysis and Condition Diagnostics* (A3-FALCON), TU-Graz, Austria, 19.03.2015.
- [62] Workshop on *Mathematics in Industry*, Karl-Franzens University of Graz, Austria, 25.03.2015.
- [63] Workshop on *Emerging Mathematical Topics in Biology and Life Sciences*, Karl-Franzens University of Graz, Austria, 7.05.2015.
- [64] 8th *Applied Inverse Problems* Conference (AIP 2015), Helsinki, Finland, 25–29.05.2015. (contribution "Optimization methods for Helmholtz problem")
- [65] 7th ECCOMAS Thematic Conference on *Smart Structures and Materials* (SMART2015), Ponta Delgada, Azores, Portugal, 3–6.06.2015. (contribution "Electro-kinetic structure models with interfacial reactions")
- [66] Humboldt Kolleg on *Science in Georgia: Perspectives of development and the role of Humboldt Foundation*, Tbilisi, Georgia, 4–6.07.2015.
- [67] 26 International Workshop on *Operator Theory and its Applications* (IWOTA 2015), Tbilisi, Georgia, 6–10.07.2015. (**Co-organizer** of Thematic Session on "Variational Methods and Applications"; contribution "Topology optimization for Helmholtz problems in 2d")
- [68] VI Annual Conference of the *Georgian Mathematical Union*, Batumi, Georgia, 12–16.07.2015. (**Co-organizer** of Thematic Session on "Variational Methods and Applications"; **Section Chair; Plenary Lecture** "On generalized Poisson–Nernst–Planck equations"; contribution "Nonlinear optimization and hemi-variational inequalities for unilateral crack problems")

- [69] *Geburtstagskolloquium für Harald Friepertinger*, Karl-Franzens University of Graz, Austria, 26.09.2015.
- [70] CoMFoS International Conference on *Mathematical Analysis of Continuum Mechanics and Industrial Applications*, Kyushu University, Fukuoku, Japan, 16–18.11.2015. (**2 Keynote Lectures** "High-order topological expansions for forward and inverse Helmholtz problems")
- [71] *Graz Science Discussions: Imaging*, Institute of Chemistry, Karl-Franzens University of Graz, Austria, 4.04.2016.
- [72] *Colloquium in Applied Mathematics in honor of Gunther H. Peichl*, Karl-Franzens University of Graz, Austria, 30.06.2016.
- [73] SFB Workshop on *Imaging with Modulated/Incomplete Data 2016*, TU-Graz, Austria, 22–24.09.2016.
- [74] *10 years NAWI Graz Studien*, TU-Graz, Austria, 19.10.2016.
- [75] Adventkolloquium, TU-Graz, Austria, 30.11.2016.
- [76] Mini-Workshop on *Dynamical Systems and Nonlinear Evolutions*, Karl-Franzens University of Graz, Austria, 28.03.2017.
- [77] IAE Workshop on *Highlights of international fuel cell research 2017*, Annex 31 & 35 IEA AFC Technology Collaboration Programme, TU-Graz, Austria, 15.05.2017.
- [78] International Conference on *Elliptic and Parabolic Problems*, Gaeta Latina, Italy, 22–26.05.2017. (**Co-organizer** of Mynisumposium on "Variational Methods in Mechanics dedicated to 65th anniversary of Alexandr Khludnev"; **Section Chair**; contribution "Variational problems with limiting small strain and contacting crack faces")
- [79] International Conference *Equadiff 2017*, Bratislava, Slovakia, 24–28.07.2017. (contribution "Limiting small strain problems with cracks")
- [80] Final ERC-CZ MORE Conference on *Implicitly Constituted Materials: Modeling, Analysis and Computing*, Roztoky u Prahy, Czech Republic, 31.07–4.08.2017. (**Invited Lecture** "On the states of stress and strain adjacent to a crack in a strain limiting viscoelastic body")
- [81] Symposium of *Montclair State University - Karl-Franzens University*, Meerscheinschlössl, Graz, Austria, 5–6.10.2017. (poster "Homogenization of the generalized Poisson–Nernst–Planck problem in a two-phase medium")
- [82] Festkolloquium zum Anlass des *60. Geburtstag von Prof.Dr. Robert Tichy*, TU-Graz, Austria, 19–20.10.2017.
- [83] International SFB-Workshop on *Modelling and Simulation in Biomedical Applications*, Bildungshaus Mariatrost, Graz, Austria, 24–25.10.2017. (contribution "Homogenization of the generalized Poisson–Nernst–Planck

- problem in a two-phase medium”)
- [84] Festkolloquium zum Anlass des *50. Geburtstages von Herrn Univ.-Prof. Dr. Olaf Steinbach*, TU-Graz, Austria, 10.11.2017.
 - [85] International Conference on *Applied Mathematics and Informatics* (ICAMI 2017), San Andres, Colombia, 27.11–1.12.2017. (**Program Committee**; contribution ”Inverse scattering using topological optimality condition for identification of object center”)
 - [86] SFB F32 MOBIS ”Mathematical Optimization and Applications in Biomedical Sciences” *Closing Event*, Bildungshaus Mariatrost, Graz, Austria, 4.04.2018.
 - [87] Workshop on *Regularity Theory for Elliptic and Parabolic Systems and Problems in Continuum Mechanics*, Telč, Czech Republic, 2–5.05.2018. (contribution ”On solution of initial boundary value problems in hypoplasticity”)
 - [88] 9th International Conference on *Inverse Problems: Modeling & Simulation*, Paradise-Bay Hotel, Malta, 21–25.05.2018 (**Co-organizer** of Mynisumposium on ”Inverse and Control Problems in Mechanics”; **Section Chair**; contribution ”Inverse scattering using topological optimality condition for identification of object”)
 - [89] CoMFoS International Conference on *Mathematical Analysis of Continuum Mechanics*, Shirankaikan Annex, Kyoto, Japan, 13–15.06.2018. (**Organizing Committee**; contribution ”Shape differentiability of Lagrangians and applications”)
 - [90] Workshop on *Applied Mathematics and Simulation for Semiconductors (AMaSiS 2018)*, WIAS Berlin, Germany, 8–10.10.2018. (contribution ”Entropy method for generalized Poisson–Nernst–Planck equations”)
 - [91] International Conference on *Modern Treatment of Symmetries, Differential Equations and Applications (Symmetry 2019)* dedicated to 100th birthday of Lev Vasilievich Ovsianikov (1919-2014), Suranaree University of Technology, Nakhon Ratchasima, Thailand, 14–18.01.2019. (contribution ”Entropy method for generalized Poisson–Nernst–Planck equations”)
 - [92] 36th International JVE Conference on *Vibration and Acoustics in Civil Engineering and Fault Diagnostics*, Dubai, United Arab Emirates, 15–17.03.2019. (**Section Chair**; contribution ”Mathematical model of crack diagnosis: inverse acoustic scattering problem and its high-precision numerical solution”)
 - [93] 15th *Austrian Numerical Analysis Day*, TU-Graz, Austria, 9–10.05.2019. (contribution ”Numerical identification of inhomogeneities by inverse scattering using topological optimality condition”)

- [94] International Conference on *Elliptic and Parabolic Problems*, Gaeta Latina, Italy, 20–24.05.2019. (**Co-organizer** of Mynisumposium on "Variational Methods in Mechanics"; **Section Chair**; contribution "Variational problems for non-penetrating cracks in elastic bodies whose material moduli depend on the mean normal stress")
- [95] *15 years NAWI Graz*, Karl-Franzens University of Graz, Austria, 1.07.2019.
- [96] IGDK-1754 Mini-Workshop on *Mathematics in Industry*, Karl-Franzens University of Graz, Austria, 18.10.2019.
- [97] Workshop on *Feedback Control* during Special Semester on Optimization, Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, 28–30.11.2019. (poster "Variational methods for the identification of objects")
- [98] Online International Workshop on *Advanced Topics in Dynamical Systems*, University of Kufa, Iraq, 20–22.05.2020.
- [99] Online Workshop on *Reaction, Diffusion, and Molecular Communication*, Karl-Franzens University of Graz, Austria, 25.05.2020.
- [100] *Doctoral Academy Day 2020* (online), Karl-Franzens University of Graz, Austria, 12.11.2020.
- [101] The Second Russia-Japan Workshop on *Mathematical analysis of fracture phenomena for elastic structures and its applications - 20th Conference of Continuum Mechanics Focusing on Singularities (CoMFoS20)*, Novosibirsk-Tokyo (online), 15–17.12.2020. (**Chairman**; contribution "On solution of initial boundary value problems in hypoplasticity")
- [102] *Tag der Mathematik* (online), PH Steiermark, Austria, 4.02.2021.
- [103] 3rd International Workshop on *Advanced Topics in Dynamical Systems*, University of Kufa, Iraq (online), 1.03.2021.
- [104] 9th International Conference on *Applied Analysis and Mathematical Modelling (ICAAMM2021)*, Biruni University, Istanbul, Turkey (online), 11–13.06.2021. (contribution "Shape differentiability of semilinear equilibrium-constrained optimization")

Scientific Visits

- [1] *Seminar am Institut für Numerische Mathematik*, TU Dresden, Germany, 23.11.1999. (lecture "Iteration penalty method with application in mechanics ")
- [2] *Seminar an der CAESAR-Stiftung*, Bonn, Germany, 14.12.1999. (lecture "Sensitivity of crack in elastic bodies via material derivatives")

- [3] *Seminar at the Department of Mathematics*, Keio University, Yokohama, Japan, 20–21.09.2006. (lectures “Primal-dual shape sensitivity analysis of constrained crack problems” and “Quasi-static crack propagation via global optimization approach”)
- [4] *Seminar at the Chair of Mechanics of Composites of the Department of Mechanics and Mathematics*, Moscow State University, Russia, 12.03.2007. (lecture “Variational methods in the theory of cracks with constraints”)
- [5] *L.A. Galin Seminar on Continuum Mechanics*, Institute for Problems in Mechanics, Moscow, Russia, 16.03.2007. (lecture “Variational methods in the theory of cracks with constraints”)
- [6] *Seminar at the Chair of Elasticity of Departments of Mathematics and Mechanics*, St.-Petersburg State University, Russia, 14.06.2007. (lecture “Variational methods in the theory of cracks with constraints”)
- [7] *Keio University*, Yokohama, Japan, 20–24 and 28–30.11.2007.
- [8] *Gunma University* in Kiryu, and *Keio University* in Yokohama, Japan, 20.02–02.03.2010.
- [9] *Universidad Tecnologica de Pereira*, Pereira, Colombia, 19–24.11.2013. (3 lectures “Mini-course on (classic) solution of PDEs”)
- [10] *Kolloquium Angewandte Mathematik*, Department of Mathematics, Friedrich-Alexander University of Erlangen-Nürnberg, Germany, 23–25.04.2014. (lecture “A nonlinear crack - defect interaction”)
- [11] *Oberseminar Dynamische Systeme: Mathematische Grundlagen und Anwendungen*, Department of Mathematics, TU Munich, Germany, 19–20.01.2015. (lecture “On generalized Poisson-Nernst-Planck equations”)
- [12] *Kolloquium Angewandte Mathematik*, Institut für Mathematik und Bauinformatik, Universität der Bundeswehr München, Germany, 23–24.04.2015. (lecture “Nonlinear optimization and hemi-variational inequalities for unilateral crack problems”)
- [13] *Tokyo University of Sciences*, Japan, 19–20.11.2015.
- [14] *Oberseminar Dynamische Systeme: Mathematische Grundlagen und Anwendungen*, Department of Mathematics, TU Munich, Germany, 25–26.01.2016. (lecture “Analysis of nonlinear elasticity models with limiting strain for cracks subject to non-penetration”)
- [15] *Charles University and Czech Academy of Sciences*, Prague, Czech Republic, 18–23.02.2016. (2 lectures: “Nonlinear optimization and hemi-variational inequalities for unilateral crack problems” at *ERC MORE seminar*, and “On generalized Poisson–Nernst–Planck equations” at

J. Nečas seminar on Continuum Mechanics)

- [16] *Institute of Computational Biology*, Helmholtz Zentrum München, Germany, 1–6, 22–25.08.2016.
- [17] *Department of Evolution Differential Equations*, Institute of Mathematics of the Czech Academy of Sciences, Prague, 17–20.08.2016.
- [18] *Department of Evolution Differential Equations*, Institute of Mathematics of the Czech Academy of Sciences, Prague, 1–6.03.2017.
- [19] *Matemáticas y Coloquio de Ecuaciones Diferenciales Parciales*, Universidad Tecnológica de Pereira, Pereira, Colombia, 24–25.11.2017. (2 lectures "Petrov-Galerkin based generalized FEM for Helmholtz equation", "Variational methods for nonlinear crack problems")
- [20] *Department of Evolution Differential Equations*, Institute of Mathematics of the Czech Academy of Sciences, Prague, 14–18.12.2017.