Jakub Šístek

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Personal information

CONTACT INFORMATION

Institute of Mathematics
of the Czech Academy of Sciences
Žitná 25
115 67 Prague 1
Czech Republic

(+420) 222 090 710 (office)
(+420) 606 609 551 (mobile)
sistek@math.cas.cz
http://users.math.cas.cz/~sistek

RESEARCH INTERESTS

Numerical Analysis: numerical solution of partial differential equations, numerical linear algebra, domain decomposition methods, finite element method.

Computational Fluid Dynamics: incompressible viscous flow simulations, vortex identification methods, parellel solvers for CFD.

Programming: high-performance computing, task-based programming, GPU computing.

EDUCATION

Ph.D. (2008) Czech Technical University in Prague (Czech Republic)
Faculty of Mechanical Engineering, Department of Mathematics
Dissertation title: *The finite element method in fluids: stabilization and domain decomposition*, advisor Pavel Burda

Ing. (MSc equivalent) (2005) Czech Technical University in Prague (Czech Republic)
Faculty of Mechanical Engineering, Department of Mathematics, with *summa cum laude*
Thesis title: *Stabilization of finite element method for solving incompressible viscous flows*, advisor Pavel Burda

QUALIFICATIONS AND SOCIETY MEMBERSHIPS

eu-maths-in.cz — Czech Network for Mathematics in Industry
treasurer (elected) 2015–present
member 2014–present

Society for Industrial and Applied Mathematics (SIAM)
member 2019–present

Union of Czech Mathematicians and Physicists (JČMF) through the *Czech Mathematical Society (ČMS)*
member 2009–present

APPOINTMENTS

Institute of Mathematics of the Czech Academy of Sciences, Prague (Czech Republic)
Chair of the Department of Constructive Methods of Math. Analysis 2023–present
Research Fellow, Department of Constructive Methods of Math. Analysis 2013–present
Postdoctoral Fellow, Department of Constructive Methods of Math. Analysis 2009–2012

Czech Technical University in Prague, Faculty of Information Technology
Teaching Assistant at the Department of Applied Mathematics (part-time) 2020–present

School of Mathematics, The University of Manchester (United Kingdom)
Research Fellow Jan 2018–Sep 2018
Research Associate Apr 2016–Dec 2017

University of Cambridge, Department of Engineering (United Kingdom)
Research Associate Mar–Jul 2011, Dec 2011–Jan 2012

University of Colorado Denver, Dept. of Mathematical & Statistical Sciences (USA)
Research Assistant Sep–Dec 2007, Feb–May 2009

Institute of New Technologies and Applied Informatics, Technical University of Liberec
Research Assistant (part-time) 2010–2016

Aeronautical Research and Test Institute, Prague
Research Assistant at the Dept. of Low Speed Aerodynamics (part-time) 2006–2009

Institute of Thermomechanics of the Academy of Sciences of the Czech Republic, Prague
Research Assistant (part-time) 2005–2009

Czech Technical University in Prague, Faculty of Mechanical Engineering
Teaching Assistant at the Department of Mathematics (part-time) 2003–2014

RESEARCH VISITS

University of Colorado Denver, Dept. of Mathematical & Statistical Sciences (USA)
Visiting Researcher (with Prof Mandel) Sep–Oct 2012, Mar–May 2013, Feb 2014

CINECA Supercomputing Centre, Bologna (Italy)
Visiting Researcher (within HPC Europa 2 project) Sep–Nov 2010

Edinburgh Parallel Computing Centre (United Kingdom)
Visiting Researcher (within HPC Europa project) Sep–Dec 2005

Research contributions

PUBLICATIONS

Author or co-author of 29 papers in peer-reviewed journals, 26 papers in peer-reviewed conference proceedings, and co-editor of 14 books of peer-reviewed conference proceedings.

Peer-reviewed journal papers

1. Urban, O., Pochylý, F., Šístek, J., Pátý, M., and Štefan, D. Viscous acceleration vector field as a tool for the analysis of vortical structures. *Physics of Fluids 38*, 5 (2026), 053109.
2. Hanek, M., Papež, J., and Šístek, J. Speeding up an unsteady flow simulation by adaptive BDDC and Krylov subspace recycling. *Computer Methods in Applied Mechanics and Engineering 452* (2026), 118788.
3. Kolář, V., and Šístek, J. Two complementary eigen-based geometric properties of a vortex. *Physics of Fluids 36*, 11 (2024), 111703.
4. Febrianto, E., Šístek, J., Kůs, P., Kecman, M., and Cirak, F. A three-grid high-order immersed finite element method for the analysis of CAD models. *Computer-Aided Design 173* (2024), 103730.
5. Kolář, V., and Šístek, J. Orbitally compact and loose vortex regions. *Physics of Fluids 35*, 12 (2023), 121708.
6. Šístek, J., and Oberhuber, T. Acceleration of a parallel BDDC solver by using graphics processing units on subdomains. *The International Journal of High Performance Computing Applications 37*, 2 (2023), 151–164.
7. Kolář, V., and Šístek, J. Disappearing vortex problem in vortex identification: Non-existence for selected criteria. *Physics of Fluids 34*, 7 (2022), 071704.
8. Solovský, J., Fučík, R., and Šístek, J. BDDC for MHFEM discretization of unsteady two-phase flow in porous media. *Computer Physics Communications 271* (2022), 108199.
9. Hanek, M., Šístek, J., and Burda, P. Multilevel BDDC for incompressible Navier–Stokes equations. *SIAM Journal on Scientific Computing 42*, 6 (2020), C359–C383.
10. Kolář, V., and Šístek, J. Consequences of the close relation between Rortex and swirling strength. *Physics of Fluids 32*, 9 (2020), 091702.
11. Kolář, V. and Šístek, J. Stretching response of Rortex and other vortex-identification schemes. *AIP Advances 9* (2019), Article ID 105025.
12. Dongarra, J., Gates, M., Haidar, A., Kurzak, J., Luszczek, P., Wu, P., Yamazaki, I., YarKhan, A., Abalenkovs, M., Bagherpour, N., Hammarling, S., Šístek, J., Stevens, D., Zounon, M., and Relton, S. D. PLASMA: Parallel linear algebra software for multicore using OpenMP. *ACM Trans. Math. Softw., 45*, 2 (2019), 16:1–16:35.
13. Kolář, V. and Šístek, J. Vortex and the balance between vorticity and strain rate. *International Journal of Aerospace Engineering 2019*, Article ID 1321480.
14. Šístek, J. and Kolář, V. Average contra-rotation and co-rotation of line segments for flow field analysis. *Journal of Physics: Conference Series 822*, 1 (2017), 012070.
15. Kůs, P. and Šístek, J. Coupling parallel adaptive mesh refinement with a nonoverlapping domain decomposition solver. *Adv. Eng. Softw. 110* (2017), 34–54.
16. Šístek, J., Březina, J., and Sousedík, B. BDDC for mixed-hybrid formulation of flow in porous media with combined mesh dimensions. *Numer. Linear Algebra Appl. 22*, 6 (2015), 903–929.
17. Šístek, J. and Cirak, F. Parallel iterative solution of the incompressible Navier-Stokes equations with application to rotating wings. *Comput. & Fluids 122* (2015), 165–183.
18. Kolář, V. and Šístek, J. Corotational and compressibility aspects leading to a modification of the vortex-identification Q-criterion. *AIAA Journal 53*, 8 (2015), 2406–2410.
19. Kolář, V., Šístek, J., Cirak, F., and Moses, P. Average corotation of line segments near a point and vortex identification. *AIAA Journal 51*, 11 (2013), 2678–2694.
20. Sousedík, B., Šístek, J., and Mandel, J. Adaptive-Multilevel BDDC and its parallel implementation. *Computing 95*, 12 (2013), 1087–1119.

21. Šístek, J., Čertíková, M., Burda, P., and Novotný, J. Face-based selection of corners in 3D substructuring. *Math. Comput. Simulation 82*, 10 (2012), 1799–1811.
22. Mandel, J., Sousedík, B., and Šístek, J. Adaptive BDDC in three dimensions. *Math. Comput. Simulation 82*, 10 (2012), 1812–1831.
23. Šístek, J., Sousedík, B., Burda, P., Mandel, J., and Novotný, J. Application of the parallel BDDC preconditioner to the Stokes flow. *Comput. & Fluids 46* (2011), 429–435.
24. Hájek, J., Szöllös, A., and Šístek, J. A new mechanism for maintaining diversity of Pareto archive in multiobjective optimization. *Adv. Eng. Softw. 41*, 7–8 (2010), 1031–1057.
25. Šístek, J., Novotný, J., Mandel, J., Čertíková, M., and Burda, P. BDDC by a frontal solver and stress computation in a hip joint replacement. *Math. Comput. Simulation 80*, 6 (2010), 1310–1323.
26. Burda, P., Novotný, J., and Šístek, J. Accuracy of semiGLS stabilization of FEM for solving Navier–Stokes equations and a posteriori error estimates. *Internat. J. Numer. Methods Fluids 56*, 8 (2008), 1167–1173.
27. Burda, P., Novotný, J., and Šístek, J. Numerical solution of flow problems by stabilized finite element method and verification of its accuracy using a posteriori error estimates. *Math. Comput. Simulation 76*, 1–3 (2007), 28–33.
28. Burda, P., Novotný, J., and Šístek, J. Finite element solution of Navier-Stokes equations adapted to a priori error estimates. *WSEAS Trans. Math. 5*, 1 (2006), 188–195.
29. Burda, P., Novotný, J., and Šístek, J. On a modification of GLS stabilized FEM for solving incompressible viscous flows. *Internat. J. Numer. Methods Fluids 51*, 9–10 (2006), 1001–1016.
30. Burda, P., Novotný, J., and Šístek, J. Precise FEM solution of a corner singularity using an adjusted mesh. *Internat. J. Numer. Methods Fluids 47*, 10–11 (2005), 1285–1292.

Peer-reviewed conference proceedings papers

1. Břichňáč, V., and Šístek, J. Performance of parallel QR factorization methods on the NVIDIA Grace CPU Superchip. In *Proceedings of Programs and Algorithms of Numerical Mathematics 22, Hejnice, Czech Republic, June 23–28, 2024*, J. Chleboun, J. Papež, K. Segeth, J. Šístek, and T. Vejchodský, Eds. Institute of Mathematics, Czech Academy of Sciences, 2025, pp. 29–40.
2. Hanek, M., Šístek, J., and Brandner, M. Reynolds-blended weights for BDDC in applications to incompressible flows. In *Domain Decomposition Methods in Science and Engineering XXVII, Lecture Notes in Computational Science and Engineering*, Z. Dostál, T. Kozubek, A. Klawonn, U. Langer, L. F. Pavarino, J. Šístek, and O. B. Widlund, Eds. Springer Cham, 2024, pp. 263–270.
3. Hanek, M., and Šístek, J. Application of Multilevel BDDC to the problem of pressure in simulations of incompressible flow. In *Domain Decomposition Methods in Science and Engineering XXVI, Lecture Notes in Computational Science and Engineering*, S. C. Brenner, E. T. S. Chung, A. Klawonn, F. Kwok, J. Xu, and J. Zou, Eds. Springer Cham, 2023, pp. 299–305.
4. Kolář, V., and Šístek, J. On the local axisymmetry of a vortex. In *Proceedings of 16th Asian Congress of Fluid Mechanics, Lecture Notes in Mechanical Engineering*, L. Venkatakrishnan, S. Majumdar, G. Subramanian, G. S. Bhat, R. Dasgupta, and J. Arakeri, Eds. Springer Singapore, 2021, pp. 175–183.
5. Hanek, M., Šístek, J., Burda, P., and Stach, E. Parallel domain decomposition solver for flows in hydrostatic bearings. In *Proceedings of Topical Problems of Fluid Mechanics 2018, Prague, Czech Republic, February 21–23, 2018*, D. Šimurda and T. Bodnár, Eds. Institute of Thermomechanics AS CR, 2018, pp. 137–144.
6. Hanek, M., Šístek, J., and Burda, P. The effect of irregular interfaces on the BDDC method for the Navier-Stokes equations. In *Domain Decomposition Methods in Science and Engineering XXIII, Lecture Notes in Computational Science and Engineering*, C.-O. Lee, X.-C. Cai, D. Keyes, H. Kim, A. Klawonn, E.-J. Park, and O. Widlund, Eds. Springer, 2017, pp. 171–178.
7. Šístek, J. A parallel finite element solver for unsteady incompressible Navier-Stokes equations. In *Proceedings of Topical Problems of Fluid Mechanics 2015, Prague, Czech Republic, February 11–13, 2015*, D. Šimurda and T. Bodnár, Eds. Institute of Thermomechanics AS CR, 2015, pp. 193–198.
8. Hanek, M., Šístek, J., and Burda, P. An application of the BDDC method to the Navier-Stokes equations in 3-D cavity. In *Proceedings of Programs and Algorithms of Numerical Mathematics 17, Dolní Maxov, Czech Republic, June 8–13, 2014*, J. Chleboun, P. Přikryl, K. Segeth, J. Šístek, and T. Vejchodský, Eds. Institute of Mathematics AS CR, 2015, pp. 77–85.

9. Čertíková, M., Šístek, J., and Burda, P. Different approaches to interface weights in the BDDC method in 3D. In *Proceedings of Programs and Algorithms of Numerical Mathematics 17, Dolní Maxov, Czech Republic, June 8–13, 2014*, J. Chleboun, P. Přikryl, K. Segeth, J. Šístek, and T. Vejchodský, Eds. Institute of Mathematics AS CR, 2015, pp. 47–57.
10. Kolář, V. and Šístek, J. Recent progress in explicit shear-eliminating vortex identification. In *Proceedings of 19th Australasian Fluid Mechanics Conference, Melbourne, Australia, December 8–11, 2014*, H. Chowdhury and F. Alam, Eds. RMIT University, 2014. Article no. 274.
11. Šístek, J., Mandel, J., Sousedík, B., and Burda, P. Parallel implementation of Multilevel BDDC. In *Numerical Mathematics and Advanced Applications 2011 (Proceedings of ENUMATH 2011)*, A. Cangiani et al., Eds. Springer, 2013, pp. 681–689.
12. Šístek, J., Kolář, V., Cirak, F., and Moses, P. Fluid-Structure Interaction and Vortex Identification. In *Proceedings of the Eighteenth AUSTRALASIAN FLUID MECHANICS CONFERENCE*, Brandner, P.A. and Pearce, B.W., Eds. Australasian Fluid Mechanics Society 2012. Paper no. 125.
13. Šístek, J., Mandel, J., and Sousedík, B. Some practical aspects of parallel adaptive BDDC method. In *Proceedings of Applications of Mathematics 2012*, J. Brandts, J. Chleboun, S. Korotov, K. Segeth, J. Šístek, and T. Vejchodský, Eds. Institute of Mathematics AS CR, 2012, pp. 253–266.
14. Čertíková, M., Burda, P., and Šístek, J. Numerical comparison of different choices of interface weights in the BDDC method. In *Proceedings of Applications of Mathematics 2012*, J. Brandts, J. Chleboun, S. Korotov, K. Segeth, J. Šístek, and T. Vejchodský, Eds. Institute of Mathematics AS CR, 2012, pp. 55–61.
15. Burda, P., Novotný, J., and Šístek, J. Analytical solution of Stokes flow near corners and applications to numerical solution of Navier-Stokes equations with high precision. In *Proceedings of Applications of Mathematics 2012*, J. Brandts, J. Chleboun, S. Korotov, K. Segeth, J. Šístek, and T. Vejchodský, Eds. Institute of Mathematics AS CR, 2012, pp. 43–54.
16. Burda, P., Novotný, J., and Šístek, J. Singularities in lid driven cavity solved by adjusted finite element method. In *Computational Fluid Dynamics 2010, Proceedings of 6th ICCFD Conference, St. Petersburg, Russia, July 12–16, 2010*, A. Kuzmin, Ed. Springer, 2011, pp. 799–805.
17. Kolář, V., Moses, P., and Šístek, J. Triple Decomposition Method for Vortex Identification in Two-Dimensional and Three-Dimensional Flows. In *Computational Fluid Dynamics 2010, Proceedings of 6th ICCFD Conference, St. Petersburg, Russia, July 12–16, 2010*, A. Kuzmin, Ed. Springer, 2011, pp. 225–231.
18. Šístek, J., Burda, P., Mandel, J., Novotný, J., and Sousedík, B. A parallel implementation of the BDDC for the Stokes flow. In *Computational Fluid Dynamics 2010, Proceedings of 6th ICCFD Conference, St. Petersburg, Russia, July 12–16, 2010*, A. Kuzmin, Ed. Springer, 2011, pp. 806–812.
19. Čertíková, M., Burda, P., Novotný, J., and Šístek, J. Some remarks on averaging in the BDDC method. In *Proceedings of Programs and Algorithms of Numerical Mathematics 15, Dolní Maxov, Czech Republic, June 6–11, 2010*, T. Vejchodský et al., Eds. Institute of Mathematics AS CR, Praha, 2010, pp. 28–34.
20. Šístek, J., Burda, P., Mandel, J., Novotný, J., and Sousedík, B. On a parallel implementation of the BDDC method and its application to the Stokes problem. In *Parallel Computational Fluid Dynamics, Recent Advances and Future Directions*, R. Biswas, Ed. DEStech Publications, Lancaster, USA, 2010, pp. 289–296.
21. Burda, P., Novotný, J., and Šístek, J. Accuracy Analysis Based on A Posteriori Error Estimates of SemiGLS Stabilization of FEM for Solving Navier-Stokes Equations. In *Computational Fluid Dynamics 2008, Proceedings of 5th ICCFD Conference, Seoul, South Korea, July 7–11, 2008*, H. Choi, and J. Yoo, Eds. Springer, 2009, pp. 315–320.
22. Burda, P., Novotný, J., and Šístek, J. Semi-GLS stabilization of FEM applied to incompressible flows with higher Reynolds numbers. In *Computational Fluid Dynamics 2006, Proceedings of 4th ICCFD Conference, Ghent, Belgium, July 10–14, 2006*, H. Deconinck and E. Dick, Eds. Springer, 2009, pp. 203–208.
23. Šístek, J., Burda, P., Čertíková, M., and Novotný, J. On Construction of The Coarse Space in the BDDC Method. In *Proceedings of Programs and Algorithms of Numerical Mathematics 14, Dolní Maxov, Czech Republic, June 1–6, 2008*, J. Chleboun et al., Eds. Institute of Mathematics AS CR, Praha, 2008, pp. 177–184.
24. Burda, P., Novotný, J., and Šístek, J. Accuracy investigation of a stabilized FEM for solving flows of incompressible fluid. In *Proceedings of Programs and Algorithms of Numerical*

Mathematics 13, Praha, Czech Republic, May 28–31, 2006, J. Chleboun et al., Eds. Institute of Mathematics AS CR, Praha, 2006, pp. 30–36.

25. Burda, P., Novotný, J., Sousedík, B., and Šístek, J. Finite element mesh adjusted to singularities applied to axisymmetric and plane flow. In *Proceedings of Numerical Mathematics and Advanced Applications (ENUMATH), Praha, Czech Republic, August 18–22, 2003*, M. Feistauer et al., Eds. Springer, Berlin, 2004, pp. 186–195.
26. Burda, P., Novotný, J., and Šístek, J. Accurate solution of corner singularities in axisymmetric and plane flows using adjusted mesh of finite elements. In *Computational Fluid Dynamics 2006, Proceedings of 3rd ICCFD Conference, Toronto, Canada, July 12–16*, C. Groth and D. W. Zingg, Eds. Springer, 2004, pp. 463–468.
27. Burda, P., Novotný, J., Sousedík, B., and Šístek, J. A priori and a posteriori error estimates for Navier-Stokes equations applied to incompressible flows. In *Proceedings of Programs and Algorithms of Numerical Mathematics 12, Dolní Maxov, Czech Republic, June 6–11, 2004*, J. Chleboun et al., Eds. Institute of Mathematics AS CR, Praha, 2004, pp. 24–33.

Peer-reviewed edited books of proceedings

1. Chleboun, J., Papež, J., Segeth, K., Šístek, J., and Vejchodský, T., Eds. *Proceedings of Seminar Programs and Algorithms of Numerical Mathematics 22* (Prague, 2025), Institute of Mathematics, Czech Academy of Sciences.
2. Dostál, Z., Kozubek, T., Klawonn, A., Langer, U., Pavarino, L. F., Šístek, J., and Widlund, O. B., Eds. *Domain Decomposition Methods in Science and Engineering XXVII, Lecture Notes in Computational Science and Engineering* (Cham, 2024), Springer.
3. Chleboun, J., Kůs, P., Papež, J., Rozložník, M., Segeth, K., and Šístek, J., Eds. *Proceedings of Seminar Programs and Algorithms of Numerical Mathematics 21* (Prague, 2023), Institute of Mathematics, Czech Academy of Sciences.
4. Chleboun, J., Kůs, P., Přikryl, P., Rozložník, M., Segeth, K., and Šístek, J., Eds. *Proceedings of Seminar Programs and Algorithms of Numerical Mathematics 20* (Prague, 2021), Institute of Mathematics, Czech Academy of Sciences.
5. Kozubek, T., Arbenz, P., Jaroš, J., Říha, L., Šístek, J., and Tichý, P., Eds. *High Performance Computing in Science and Engineering, 4th International Conference HPCSE 2019, Karolinka, Czech Republic, May 20-23, 2019* (2021), Lecture Notes in Computer Science, Springer.
6. Chleboun, J., Kůs, P., Přikryl, P., Rozložník, M., Segeth, K., Šístek, J., and Vejchodský, T., Eds. *Proceedings of Seminar Programs and Algorithms of Numerical Mathematics 19* (Prague, 2019), Institute of Mathematics, Czech Academy of Sciences.
7. Kozubek, T., Čermák, M., Tichý, P., Blaheta, R., Šístek, J., Lukáš, D., and Jaroš, J., Eds. *High Performance Computing in Science and Engineering, Third International Conference HPCSE 2017, Karolinka, Czech Republic, May 22-25, 2017* (2018), Lecture Notes in Computer Science, Springer.
8. Chleboun, J., Kůs, P., Přikryl, P., Segeth, K., Šístek, J., and Vejchodský, T., Eds. *Proceedings of Seminar Programs and Algorithms of Numerical Mathematics 18* (Prague, 2017), Institute of Mathematics, Czech Academy of Sciences.
9. Kozubek, T., Blaheta, R., Šístek, J., Rozložník, M., and Čermák, M., Eds. *High Performance Computing in Science and Engineering, Second International Conference HPCSE 2015, Soláň, Czech Republic, May 25-28, 2015* (2016), Lecture Notes in Computer Science, Springer.
10. Brandts, J., Korotov, S., Křížek, M., Segeth, K., Šístek, J., and Vejchodský, T., Eds. *Proceedings of the International Conference Applications of Mathematics 2015, in honor of the birthday anniversaries of Ivo Babuška, (90), Milan Práger (85), and Emil Vitásek (85)* (Prague, 2015), Institute of Mathematics, Czech Academy of Sciences.
11. Chleboun, J., Přikryl, P., Segeth, K., Šístek, J., and Vejchodský, T., Eds. *Proceedings of Seminar Programs and Algorithms of Numerical Mathematics 17* (Prague, 2015), Institute of Mathematics, Czech Academy of Sciences.
12. Brandts, J., Korotov, S., Křížek, M., Šístek, J., and Vejchodský, T., Eds. *Proceedings of the International Conference Applications of Mathematics 2013, in honor of the 70th birthday of Karel Segeth* (Prague, 2013), Institute of Mathematics, Academy of Sciences of the Czech Republic.
13. Chleboun, J., Segeth, K., Šístek, J., and Vejchodský, T., Eds. *Proceedings of Seminar Programs and Algorithms of Numerical Mathematics 16* (Prague, 2013), Institute of Mathematics, Academy of Sciences of the Czech Republic.
14. Brandts, J., Chleboun, J., Korotov, S., Segeth, K., Šístek, J., and Vejchodský, T., Eds. *Proceedings of the International Conference Applications of Mathematics 2012, in honor of the 60th birthday*

of Michal Křížek (Prague, 2012), Institute of Mathematics, Academy of Sciences of the Czech Republic.

15. Vejchodský, T., Chleboun, J., Přikryl, P., Segeth, K., and Šístek, J., Eds. *Proceedings of Seminar Programs and Algorithms of Numerical Mathematics 15* (Prague, 2010), Institute of Mathematics, Academy of Sciences of the Czech Republic.

PARTICIPATION IN INTERNATIONAL RESEARCH PROJECTS

INTERTWinE, Programming Model INTERoperability ToWards Exascale, coordinator: University of Edinburgh, role: team member at the University of Manchester, awarded by European Commission under the FETHPC programme Oct 2015–Sep 2018

HIGHERFLY, Immersed methods for insect flight aerodynamics, coordinator: University of Cambridge, role: coinvestigator, awarded by PRACE infrastructure under DECI programme May 2013–Jul 2014

HIFLY, Direct numerical simulation of flows occurring in insect flight, coordinator: University of Cambridge, role: coinvestigator, awarded by PRACE infrastructure under DECI programme Nov 2011–Oct 2012

PARTICIPATION IN NATIONAL RESEARCH PROJECTS

GAČR 23-06159S, Vortical structures: advanced identification and efficient numerical simulation, coordinator: Institute of Mathematics CAS, role: principal investigator, awarded by Czech Science Foundation 2023–2025

Vortical structures: efficient numerical simulation and advanced identification, coordinator: Institute of Mathematics CAS, role: principal investigator, computing time awarded by IT4Innovations June 2023–May 2026

Multilevel domain decomposition for accelerated incompressible flow simulations coordinator: Institute of Mathematics CAS, role: principal investigator, computing time awarded by IT4I Oct 2022–June 2023

GAČR 20-01074S, Adaptive methods for the numerical solution of partial differential equations: analysis, error estimates and iterative solvers, coordinator: Charles University, role: team member at the Institute of Mathematics CAS, awarded by Czech Science Foundation 2020–2022

GAČR 18-09628S, Advanced flow-field analysis, coordinator: Institute of Hydrodynamics of CAS, role: principal coinvestigator, awarded by Czech Science Foundation 2018–2020

Advanced incompressible flow simulations for vortex identification, coordinator: Institute of Mathematics CAS, role: principal investigator, computing time awarded by IT4Innovations Sep 2019–April 2021

High-resolution flow simulations for vortex identification, coordinator: Institute of Mathematics CAS, role: principal investigator, computing time awarded by IT4Innovations Sep 2018–June 2019

GAČR 14-02067S, Advanced methods for flow-field analysis, coordinator: Institute of Hydrodynamics of CAS, role: principal coinvestigator, awarded by Czech Science Foundation 2014–2016

Multilevel Domain Decomposition Solvers for Incompressible Flows, coordinator: Institute of Mathematics CAS, role: principal investigator, computing time awarded by IT4Innovations Dec 2015–Aug 2016

Domain Decomposition Solvers for Incompressible Flows, coordinator: Institute of Mathematics CAS, role: principal investigator, computing time awarded by IT4Innovations Jan–Sep 2015

Scalable Solvers for Subsurface Flow Simulations, coordinator: Institute of Mathematics CAS, role: principal investigator, computing time awarded by IT4Innovations Jun–Dec 2013

LH11004, Domain Decomposition Methods, coordinator: Czech Technical University in Prague, role: team member, awarded by AMVIS–MŠMT 2011–2014

EP/G008531/1, Computational Toolbox for Fluid-Membrane Interaction with Applications to Micro Air Vehicles and Insect Flight, coordinator: University of Cambridge, role: team member, awarded by EPSRC 2009–2012

DMS-0713876, Adaptive Multilevel Iterative Substructuring Methods, coordinator: University of Colorado Denver, role: team member, awarded by NSF 2007–2010

CITATIONS

350 (h-index 10) according to *Web of Science*, 422 (h-index 12) according to *Scopus*, and 761 (h-index 16) according to *Google Scholar*.

PRESENTATIONS AT INTERNATIONAL CONFERENCES

1. Two complementary eigen-based geometric properties of a vortex. *Vortex 2025*. University of Texas at Arlington, USA, December 15–17, 2025. **Invited plenary lecture.**
2. Speeding up an unsteady flow simulation by the adaptive BDDC and Krylov subspace recycling. *Computational Mechanics 2025*. Srní, Czech Republic, November 3–5, 2025.
3. Scalable domain decomposition solver for three-grid immersed finite element method. *European Conference on Numerical Mathematics and Advanced Applications (ENUMATH) 2025*. Heidelberg, Germany, September 1–5, 2025.
4. Speeding up an unsteady flow simulation by the adaptive BDDC and Krylov subspace recycling. *Large-Scale Scientific Computations (LSSC) 2025*. Sozopol, Bulgaria, June 16–20, 2025. **Invited minisymposium lecture.**
5. Scalable domain decomposition solver for three-grid immersed finite element method. *Math to Product (M2P) 2025*. Valencia, Spain, June 4–6, 2025. **Invited keynote minisymposium lecture.**
6. Speeding up an unsteady flow simulation by the adaptive BDDC and Krylov subspace recycling. *Seminar on Numerical Analysis 2025*. Ostrava, Czech Republic, January 27–31, 2025.
7. Towards a scalable domain decomposition solver for immersed boundary finite element method. *Computational Mechanics 2024*. Srní, Czech Republic, November 4–6, 2024.
8. Synergy of Adaptive Coarse Space and Krylov Subspace recycling for the BDDC method. *Programs and Algorithms of Numerical Mathematics 22*. Hejnice, Czech Republic, June 23–28, 2024.
9. Towards a scalable domain decomposition solver for immersed boundary finite element method. *ECCOMAS Congress 2024*. Lisbon, Portugal, June 3–7, 2024. **Selected as a keynote minisymposium lecture.**
10. Towards a scalable domain decomposition solver for immersed boundary finite element method. *High Performance Computing in Science and Engineering (HPCSE) 2024*. Hotel Soláň, Czech Republic, May 20–23, 2024.
11. Tailoring BDDC to Immersed Boundary FEM with Adaptive Grid Refinement. *DD XXVIII*. KAUST, Saudi Arabia, January 28–February 1, 2024.
12. Towards a Scalable Multilevel Domain Decomposition Solver for Immersed Boundary Finite Element Method. *10th International Congress on Industrial and Applied Mathematics (ICIAM) 2023*. Tokyo, Japan, August 20–25, 2023. **Invited minisymposium lecture.**
13. Adaptive-Multilevel BDDC: A Scalable Domain Decomposition Method for Problems in Computational Mechanics. *International Conference on Computational Science (ICCS) 2023*. Prague, Czech Republic, July 3–5, 2023. **Invited plenary lecture.**
14. Scalable Multilevel Domain Decomposition Solver for Immersed Boundary Finite Element Method. *Large-Scale Scientific Computations (LSSC) 2023*. Sozopol, Bulgaria, June 5–9, 2023. **Invited minisymposium lecture.**
15. A scalable multilevel domain decomposition solver for immersed boundary finite element method. *EMS School on Mathematical Modelling, Numerical Analysis and Scientific Computing*. Kácov, Czech Republic, May 28–June 2, 2023.

16. A scalable multilevel domain decomposition solver for immersed boundary finite element method. *Workshop on scientific computing 2023*. Děčín, Czech Republic, May 25–28, 2023. **Invited plenary lecture.**
17. Domain decomposition solver for immersed boundary finite element method *Seminar on Numerical Analysis 2023*. Ostrava, Czech Republic, January 23–27, 2023.
18. Applications of multilevel BDDC to problems of incompressible flows. *DD XXVII*. Prague, Czech Republic, July 25–29, 2022. **Invited plenary lecture.**
19. A parallel domain decomposition solver for immersed boundary finite element method. *Programs and Algorithms of Numerical Mathematics 21*. Jablonec nad Nisou, Czech Republic, June 19–24, 2022.
20. GPU acceleration of a parallel domain decomposition solver. *ParCFD 2022*. Alba, Italy, May 26–28, 2022.
21. GPU acceleration of a parallel domain decomposition solver. *High Performance Computing in Science and Engineering 2022*. Hotel Soláň, Czech Republic, May 16–19, 2022.
22. A parallel finite element method with an immersed boundary (Or how to avoid meshing in a mesh-based method). *Conference of Czech Mathematicians 2022*. Ostrava, Czech Republic, April 4–6, 2022. **Invited plenary lecture.**
23. Towards a parallel domain decomposition method for immersed boundary FEM. *Applications of Mathematics 2022*. Prague, Czech Republic, March 31–April 1, 2022.
24. Towards a parallel domain decomposition solver for immersed boundary finite element method. Workshop *Mathematics of High-Performance Computing 2021*. Prague, Czech Republic, September 20–21, 2021.
25. A parallel multilevel BDDC solver and its application to adaptive FEM. *14th WCCM & ECCOMAS Congress 2020*. Paris, France (Virtual Congress), January 11–15, 2021. **Invited minisymposium lecture.**
26. A parallel multilevel BDDC solver and its application to adaptive FEM. *International Conference on Domain Decomposition Methods, DD XXVI*. Hong Kong, China (ONLINE), December 7–12, 2020. **Invited minisymposium lecture.**
27. Towards a parallel domain decomposition solver for immersed boundary finite element method. *Algoritmy 2020*. Podbanské, Vysoké Tatry, Slovakia, September 10–15, 2020.
28. Parallel multilevel domain decomposition with adaptive mesh refinement. *Modelling 2019*. Olomouc, Czech Republic, September 16–20, 2019. **Invited minisymposium lecture.**
29. A parallel multilevel domain decomposition solver and its application to adaptive FEM. *High Performance Computing in Science and Engineering 2019*. Hotel Soláň, Czech Republic, May 20–23, 2019. **Invited keynote lecture.**
30. A domain decomposition solver for parallel adaptive mesh refinement. *Seminar on Numerical Analysis 2019*. Ostrava, Czech Republic, January 21–25, 2019.
31. Combining Adaptive Mesh Refinement with a Parallel Multilevel BDDC Solver. *Computational Mechanics 2018*. Srní, Czech Republic, October 31 – November 2, 2018.
32. Introducing Distributed Memory Task-based Programming to the PLASMA Numerical Library. *Applications of Mathematics 2018*. Prague, Czech Republic, August 22–25, 2018.
33. OpenMP Tasks for QR Factorization in PLASMA. *SIAM Parallel Processing for Scientific Computing 2018*. Waseda University, Tokyo, Japan, March 7–10, 2018.
34. Using OpenMP tasks for QR factorization in the PLASMA library. *High Performance Computing in Science and Engineering (HPCSE) 2017*. Hotel Soláň, Czech Republic, May 22–25, 2017.
35. Combining adaptive mesh refinement with a parallel multilevel BDDC solver. *International Conference on Domain Decomposition Methods, DD XXIV*. Longyearbyen, Svalbard, Norway, February 6–10, 2017. **Invited minisymposium lecture.**
36. Effect of adaptive mesh refinement on a parallel non-overlapping domain decomposition solver. *ECCOMAS Congress 2016*. Crete Island, Greece, June 5–10, 2016. **Invited minisymposium lecture.**
37. On application of the parallel BDDC method to incompressible flows. *IMA Conference on Numerical Methods for Simulation*. Oxford, UK, September 1–4, 2015.

38. Parallel Implementation of BDDC for Mixed-Hybrid Formulation of Flow in Porous Media. *International Conference on Domain Decomposition Methods, DD XXIII*. Jeju Island, Korea, July 6–10, 2015. **Invited minisymposium lecture.**
39. Parallel performance of iterative solvers for pressure-correction methods for incompressible flows. *High Performance Computing in Science and Engineering (HPCSE) 2015*. Hotel Soláň, Czech Republic, May 25–28, 2015.
40. Balancing domain decomposition methods. *Seminar on Numerical Analysis, SNA'15*. Institute of Geonics, Ostrava, Czech Republic, January 19–23, 2015. **Invited plenary lecture.**
41. Parallel Adaptive-Multilevel BDDC. *WCCM XI – ECCM V – ECFD VI 2014*. Barcelona, Spain, July 20–25, 2014. **Invited minisymposium lecture.**
42. Parallel Adaptive-Multilevel BDDC. *Parallel Matrix Algorithms and Applications (PMAA) 2014*. Lugano, Switzerland, July 2–4, 2014. **Invited minisymposium lecture.**
43. Parallel implementation of Adaptive-Multilevel BDDC method and applications to linear elasticity. *SPOMECH Workshop 2013*. VŠB-TU Ostrava, Czech Republic, November 13–15, 2013. **Invited plenary lecture.**
44. Parallel performance of iterative solvers for pressure-correction methods. *SPOMECH Autumn School 2012*. VŠB-TU Ostrava, Czech Republic, November 20, 2012. **Invited plenary lecture.**
45. Application of Multilevel BDDC Method to Elasticity Analysis. *European Seminar on Computing (ESCO)*. Plzeň, Czech Republic, June 25–29, 2012.
46. Primal methods of iterative substructuring. *Programs and Algorithms of Numerical Mathematics 16*. Dolní Maxov, Czech Republic, June 3–8, 2012. **Invited plenary lecture.**
47. Parallel Adaptive BDDC Method. *Applications of Mathematics*. Prague, Czech Republic, May 2–5, 2012.
48. Parallel Implementation of Multilevel BDDC Method. *European Numerical Mathematics and Advanced Applications (ENUMATH)*. Leicester, UK, September 5–9, 2011.
49. A Parallel Implementation of the BDDC Method for the Stokes Flow. *The Sixth International Conference on Computational Fluid Dynamics (ICCFD)*. St. Petersburg, Russia, July 12–16, 2010.
50. A Parallel Implementation of the BDDC method for Linear Elasticity. *MAFELAP 2009*, London, UK, June 9–12, 2009.
51. Parallel Implementation of the BDDC method. *21st International Conference on Parallel Computational Fluid Dynamics (ParCFD)*, Moffet Field, California, USA, May 18–22, 2009.
52. A posteriori error estimates in accuracy analysis of stabilized FEM. *4-th Conference on Superconvergence Phenomena in the Finite Element Method*, Prague, Czech Republic, June 25–28, 2008.
53. Accuracy investigation of stabilized FEM for flow problems. *MAFELAP 2006*, London, UK, June 13–16, 2006.
54. Galerkin Least Squares stabilization of FEM for solving incompressible viscous flows. *FEF05 - Thirteenth Conference on Finite Elements for Flow Problems*, Swansea, Wales, UK, April 4–6, 2005.

PRESENTATIONS AT INSTITUTIONS AND SEMINARS

1. Speeding up an unsteady flow simulation by the adaptive BDDC and Krylov subspace recycling, *Faculty of Science, Humanities and Education Technical University of Liberec*, November 24, 2025.
2. Large-scale simulations with a parallel multilevel domain decomposition method, *University of West Bohemia*, Pilsen, November 20, 2025.
3. Scalable domain decomposition solver for three-grid immersed finite element method, *Seminar in Numerical Mathematics*, Charles University, October 30, 2025.
4. Scalable domain decomposition solver for three-grid immersed finite element method, *Glasgow Computational Engineering Centre Seminar*, University of Glasgow, May 14, 2025.
5. Parallel implementation of immersed boundary adaptive FEM, *Seminar on Miloš Zlámal's 100th Anniversary*, Brno University of Technology, January 15, 2025.
6. Large-scale simulations with a parallel multilevel domain decomposition method, *University of West Bohemia*, Pilsen, October 17, 2024.

7. Towards a scalable domain decomposition solver for immersed boundary finite element method, *Computer Science Seminar*, Palacký University Olomouc, April 11, 2024.
8. Towards a scalable domain decomposition solver for immersed boundary finite element method, seminar *Mathematics of Computations*, University of Bonn, Germany, January 17, 2024.
9. Large-scale simulations with a parallel multilevel domain decomposition method, *University of West Bohemia*, Pilsen, November 30, 2023.
10. Adaptive-Multilevel BDDC: A Scalable Domain Decomposition Method for Problems in Computational Mechanics, *Kongju National University*, Korea, August 18, 2023.
11. Large-scale simulations with a parallel multilevel domain decomposition method, *University of West Bohemia*, Pilsen, December 20, 2022.
12. Acceleration of a parallel BDDC solver by using GPUs on subdomains, *Czech Technical University in Prague, Faculty of Mechanical Engineering*, November 29, 2022.
13. A parallel domain decomposition solver for immersed boundary finite element method, *Technical University of Liberec*, February 2, 2022 (online lecture).
14. Large-scale simulations with a parallel multilevel domain decomposition method, *University of West Bohemia*, Pilsen, November 19, 2020.
15. Large-scale simulations with a parallel multilevel domain decomposition method, *University of West Bohemia*, Pilsen, December 19, 2019.
16. Concepts of Task-based Programming and the PLASMA Numerical Library, *Charles University*, Prague, April 25, 2019.
17. A parallel multilevel domain decomposition solver and its application to adaptive finite element method, *Brno University of Technology*, Brno, April 17, 2019.
18. A parallel multilevel domain decomposition solver and its application to adaptive finite element method, *Institute of Thermomechanics of the Czech Academy of Scineces*, Prague, April 3, 2019.
19. PLASMA INTERTWinING, *Innovative Computing Lab, The University of Tennessee*, September 21, 2018.
20. OpenMP Tasks for QR Factorization in PLASMA, *The University of Manchester*, February 27, 2018.
21. Combining adaptive mesh refinement with a parallel multilevel BDDC solver, *The University of Manchester*, May 16, 2017.
22. Some recent advances of nonoverlapping domain decomposition methods, *The University of Manchester*, November 15, 2016.
23. Parallel Adaptive-Multilevel BDDC, *Charles University*, Prague, October 30, 2014.
24. Parallel Adaptive-Multilevel BDDC, *Czech Technical University in Prague*, October 15, 2014.
25. Balancing Domain Decomposition by Constraints and its applications to incompressible flows, *VŠB–Technical University of Ostrava*, September 11, 2014.
26. BDDC for mixed-hybrid formulation of flow in porous media with combined mesh dimensions, *University of Colorado Denver*, February 25, 2014.
27. Parallel Adaptive-Multilevel BDDC, *Los Alamos National Laboratory*, USA, February 12, 2014.
28. Efficient solution methods for modelling of flows around insect wings, *Charles University*, Prague, December 2, 2013.
29. Efficient solution methods for modelling of flows around insect wings, *Charles University*, Prague, October 31, 2013.
30. Parallel implementation of Adaptive-Multilevel BDDC, *Stanford University*, USA, April 4, 2013.
31. Parallel implementation of Adaptive-Multilevel BDDC Method, *University of West Bohemia*, Pilsen, November 15, 2012.
32. Parallel implementation of Adaptive-Multilevel BDDC Method, *University of Colorado Denver*, October 9, 2012.
33. Parallel implementation of Multilevel BDDC Method, *Technische Universität Dresden*, December 20, 2011.

34. Parallel implementation of Multilevel BDDC Method, *VŠB–Technical University of Ostrava*, November 15, 2011.
35. Parallel implementation of some Domain Decomposition Methods, *University of Cambridge*, November 29, 2010.
36. Parallel Implementation of some Domain Decomposition Methods, *CINECA*, Bologna, Italy, September 30, 2010.
37. Parallel implementation of the BDDC method, *University of Colorado Denver*, May 6, 2009.
38. On parallel implementation of BDDC using multifrontal solver MUMPS, *University of Colorado Denver*, December 10, 2007.

PRESENTATIONS FOR INDUSTRY

1. Vortex identification by average corotation of line segments near a point, *Techsoft Engineering, s.r.o.*, Prague, Czech Republic, February 2, 2016.
2. Exascale solvers for PDE-based simulations, *Škoda Auto, a.s.*, Mladá Boleslav, Czech Republic, October 21, 2014.

HONOURS

Otto Wichterle Premium 2013
(awarded annually by *the Czech Academy of Sciences* to promising young researchers)

Professor Babuška Prize for an important contribution to computer science 2009
(awarded jointly by *the Union of Czech Mathematicians and Physicists*
and *the Czech Society for Mechanics* for the best doctoral dissertation of the year)

Professor Zvoníček foundation award 2009
(awarded by the Faculty of Mechanical Engineering, Czech Technical University in Prague for the best doctoral dissertation in theoretical disciplines of the year)

Professor Babuška Honour for Master thesis 2005
(awarded jointly by *the Union of Czech Mathematicians and Physicists*
and *the Czech Society for Mechanics* for selected Master theses of the year)

Karel Spála Prize 2005
(awarded by the Faculty of Mechanical Engineering, Czech Technical University in Prague for the best Master thesis in theoretical disciplines of the year)

SOFTWARE

Parallel Linear Algebra Software for Multicore Architectures (PLASMA) An open-source software package for solving problems in dense linear algebra using multicore processors. Package developed at Innovative Computing Laboratory (University of Tennessee) and School of Mathematics (The University of Manchester). Written in C with task-dependent framework of OpenMP 4.0. Member of the development team at the University of Manchester.
https://bitbucket.org/icl/plasma 2016–2018

BDDCML An open-source massively parallel library for solving large systems of equations with sparse matrices by the *Adaptive-Multilevel BDDC method*. Written in Fortran 95 with MPI. Tested on up to 65 thousand processor cores. About 10 external users. Main developer.
http://users.math.cas.cz/~sistek/software/bddcml.html 2007–present

Vortex Analysis Library (VALIB) An open-source collection of routines for vortex identification and vizualization based on region-type methods. Written in C, CUDA and OpenCL. Main developer.
http://users.math.cas.cz/~sistek/software/valib/ 2009–present

SUPERVISION OF RESEARCH STUDENTS

Czech Technical University in Prague: 4 Bc students (2012, 2015, 2023, 2024), 2 MSc students (2014, 2024), 1 PhD student (2022).

Other evidence of academic and professional standing

OTHER PUBLIC SERVICE IN A PROFESSIONAL CAPACITY

Reviewer for scientific journals
Physics of Fluids,
Computers & Fluids,
Advances in Engineering Software,
Computer Physics Communication,
Journal of Computational Science,

Computers and Mathematics with Applications,
International Journal for Uncertainty Quantification,
Applications of Mathematics,
SIAM Journal on Scientific Computing,
International Journal for Numerical Methods in Fluids,
Journal of Scientific Computing,
Mathematics and Computers in Simulation,
Applied Mathematics and Computation,
Engineering with Computers,
Czechoslovak Mathematical Journal.

Reviewer for funding bodies
PRACE — External expert of PRACE research infrastructure for evaluating applications for computing time on the largest European (Tier-0) supercomputers (reviewer, panel member) 2013–present

Czech Technical University — reviewer for Student Grant Competition 2014–present

Grant Agency of the Charles University in Prague — reviewer for Student Grant Competition 2014–present

IT4Innovations — reviewer for Open Grant Competition for computing time 2024–present

Coorganiser of a weekly seminar *Current Problems in Numerical Analysis* (Institute of Mathematics CAS) since 2013.

Steering committee member for the doctoral study programme *Computational and Applied Mathematics* (VSB Technical University of Ostrava), since 2019.

Board member (elected) at the *Institute of Mathematics CAS*, since 2019.

Scientific board member at the *IT4Innovations National Supercomputing Center* (VSB Technical University of Ostrava), since 2021.

Lecturer of a two-day course *PLASMA and MAGMA software libraries for numerical linear algebra*, 10–11/9/2018, IT4Innovations National Supercomputing Center, Ostrava, Czech Republic, jointly with Piotr Luszczek (ICL UTK).

Mentor in the *AMathNet* project for knowledge transfer within applied mathematics
one week student interships in the Institute of Mathematics CAS (2014, 2013).

Organisation roles at conferences

Scientific committees of

High Performance Computing in Science and Engineering HPCSE (2024, 2022, 2019, 2017, 2015),

European School on Mathematical Modelling, Numerical Analysis and Scientific Computing at Kácov (2023, 2020, 2018, 2016).

Organizing committees of

DD27 (2022),

EQUADIFF (2026, 2013).

Programs and Algorithms of Numerical Mathematics (2024, 2022, 2020, 2018, 2016, 2014, 2012, 2010),

Applications of Mathematics (2023, 2022, 2018, 2015, 2013, 2012),

Workshop Mathematics in Industry (2024, 2023, 2022, 2021, 2020, 2019),

European exascale applications workshop, Manchester, UK, October 11–12, 2016,

Minisymposium organizer at

DD27 (Prague, Czech Republic, 2022),

DD26 (Hong Kong, 2020),

Modelling 2019 (Olomouc, Czech Republic),

DD23 (Jeju Island, Korea, 2015),

MAFELAP 2009 (London, UK).

Technical Programme Committee for *Parallel Numerical Methods and Applications* at

EuroPar'20 (Warsaw, Poland, 2020).

Panel member for *Algorithms* at

Supercomputing'24 (Atlanta, USA, 2024).

Teaching and learning

TEACHING EXPERIENCE

Czech Technical University in Prague, Czech Republic 2020–present
Faculty of Information Technology, Department of Applied Mathematics
Courses: *Linear Algebra 2 BI-LA2* (lectures and tutorials), *Mathematics for Informatics NI-MPI* (tutorials)

Charles University, Prague, Czech Republic 2019–2020
Faculty of Mathematics and Physics
Courses: *Linear Algebra and Geometry NMAG101* (tutorials)

The University of Manchester, United Kingdom 2017–2018
Department of Mathematics
Courses: *Mathematics 1E2*, *Mathematics 2M1*, *Mathematics 0F2* (tutorials)

University of West Bohemia, Pilsen, Czech Republic 2015–2016
Faculty of Applied Sciences, Department of Mathematics
Courses: *Domain Decomposition Methods* (lectures)

Czech Technical University in Prague, Czech Republic 2006–2014
Faculty of Mechanical Engineering, Department of Mathematics
Courses: *Calculus*, *Numerical Analysis*, *Algorithmization and Programming* (lectures, tutorials)

Outreach and public engagement

OUTREACH AND PUBLIC ENGAGEMENT

Science popularisation talk *Simulations, Supercomputers, ... and Mathematics* presented at

Open Doors Day of the Institute of Mathematics CAS (since 2013),

Week of Science and Technology at the Czech Academy of Sciences (2014, 2013).

Demo on *Using virtual reality (VR) for analysing simulation results* (since 2021).

Mentor of one high-school student within the high-school research competition (SOČ) 2023–2024.

Mentor of one high-school student within the programme *Open Science* of the Czech Academy of Sciences, 2024.