RUCHI SANDILYA

Contact Information

9805 Hardin Ridge Way, Unit-096
Knoxville, TN 37931, United States
☎ +1 (919)641-5377
✉ ruchi9451100@gmail.com
https://ruchi-sandilya.github.io/sandilyaruchi/

Research Interests

Finite element methods, discontinuous Galerkin methods, finite volume element methods, adaptive finite element methods, optimal control problems, scientific computing, data science, machine learning.

Professional Experience

Visiting researcher at TIFR-Centre For Applicable Mathematics, Bangalore, India (Jan, 2020–Feb, 2020)

Postdoctoral Fellow

- Weierstrass Institute for Applied Analysis and Stochastics (WIAS), Berlin, Germany (Jan, 2019 – Dec, 2019)
- TIFR-Centre For Applicable Mathematics, Bangalore, India (Aug, 2017 – Dec, 2018)

Education

Ph.D. in Applied Mathematics, Indian Institute of Space Science and Technology, 2017.

M.Sc. in Mathematics, University of Delhi, 2010.

B.Sc. in Mathematics, Banaras Hindu University, 2008.

Publications

1. S. Kumar., R. Oyarzúa, R. Ruiz-Baier, R. Sandilya, Conservative discontinuous finite volume and mixed schemes for a new four-field formulation in poroelasticity" *ESIAM: Mathematical Modelling and Numerical Analysis*, 2019 (PDF)
2. S. Kumar, R. Ruiz-Baier, R. Sandilya, "Error bounds for discontinuous finite volume discretizations of Brinkman optimal control problems". *Journal of Scientific Computing*, 2018 (PDF)
3. S. Kumar, R. Ruiz-Baier, R. Sandilya, "Mixed and discontinuous finite volume element schemes for the optimal control of immiscible flow in porous media". *Computers & Mathematics with Applications*, 2018 (URL)
4. R. Sandilya, S. Kumar, "On discontinuous interpolated finite volume approximations for semilinear elliptic optimal control problems". *Numerical Methods for Partial Differential Equations*, 2017 (PDF)
5. R. Sandilya, R. K. George, S. Kumar, "Trajectory controllability of a semilinear parabolic system". *The Journal of Analysis*, 2017 (PDF)
6. S. Kumar, R. Ruiz-Baier, R. Sandilya, "Discontinuous finite volume methods for the optimal control of Brinkman equations". *Finite Volume for Complex Applications*, 2017 (PDF)
7. R. Sandilya, S. Kumar, "Convergence of discontinuous finite volume discretizations for a semilinear hyperbolic optimal control problem". *International Journal of Numerical Analysis and Modeling*, 2016 (PDF)

8. R. Sandilya, S. Kumar, "On discontinuous finite volume approximations for semilinear parabolic optimal control problems". *International Journal of Numerical Analysis and Modeling*, 2016 (PDF)
9. R. Sandilya, S. Kumar, "Convergence analysis of discontinuous finite volume methods for elliptic optimal control problems". *International Journal of Computational Methods*, 2016 (URL)
10. R. Sandilya, S. Kumar , "Discontinuous finite volume methods for parabolic optimal control problems". *Mathematical Sciences International Research Journal* (2015) Vol. 4(2), ISSN 2278–8697, 15–22
11. R. Sandilya, S. Kumar , "Discontinuous Galerkin finite volume element methods for elliptic optimal control problems". *International Conference on Computational Methods*, 2014 (PDF)

Ongoing projects

1. Numerical stabilization of the Navier-Stokes-Boussinesq system (in collaboration with Prof. Praveen Chandrashekar, Prof. Mythily Ramaswamy, Prof. Jean-Pierre Raymond).
2. Adaptive finite element methods for generalized Nash equilibrium problems (in collaboration with Prof. Michael Hintermüller, Dr. Caroline Löbhard).

Manuscript reviews

Reviewer for manuscript submitted to *Journal of Scientific Computing*.

Programming Skills

Experience with MATLAB, FreeFem++, FEniCS, Visualization in VisIt.

Teaching

Experience with tutorial lab classes in the workshops on optimal control problems and for postgraduate courses.

Awards/ Scholarships

CSIR-UGC Junior Research Fellowship, June 2011.

Talks in conferences

- 6th International Conference on Continuous Optimization (ICCOPT 2019), August 3-8, 2019 at Technical University, Berlin, Germany.
- 9th International Congress on Industrial and Applied Mathematics (ICIAM 2019), July 15-19, 2019 at University of Valencia, Spain.
- Celebrating 75 years of Mathematics of Computation, November 1-3, 2018 at ICERM, Brown University, Providence, RI, US.
- Mathematics of Finite Elements and Applications, June 14-17, 2016 at Brunel University, London, UK.
- Received best presentation award at International Conference on Mathematics, November 26-28, 2015, University of Kerala, Thiruvananthapuram, India.
- Recent advances in PDEs: Theory, Computations and Applications, June 08-10, 2017, Indian Institute of Technology Bombay, India.
- International Conference on Recent Advances in Theoretical and Computational Partial Differential Equations with Applications, December 05-09, 2016, Panjab University, Chandigarh, India.
- International Conference on Mathematical Analysis and its Applications (ICMAA 2016), November 28-December 02, 2016, Indian Institute of Technology Roorkee, India.
- International Conference on Current Trends in PDEs: Theory and Computations, December 28-30, 2015, South Asian University, New Delhi, India.

Workshops Participation

- Advanced Training in Mathematics Workshop on New Directions in PDE Constrained Optimisation, March 12 to March 16, 2018, IIT Bombay.
- CIMPA Summer School on Current Research in Finite Element Methods (CIMPA-2015), June 24 to July 17, 2015, IIT Bombay.
- Advanced Workshop on Mathematical Foundation of Advanced Finite Element Methods (MFAFEM-2013), December 26, 2013 to January 1, 2014, BITS, PILANI-KK Birla, Goa Campus.
- Current Trends in Computational Methods for PDEs (CIMPA-2013), June 24 to July 19, 2013, IISC Bangalore.
- 3rd Indo-German Workshop on Adaptive Finite Element Methods , February 22 to March 2nd, 2013, Institute of Mathematics and Applications, Bhubaneshwar.
- Advanced Workshop on Non-Standard Finite Element Methods (AWNSFEM-2013), February 11 to 15, 2013, IIT Bombay.