

Contact

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Research Interests

Main research fields: Computational Partial Differential Equations

Main keywords: Scientific Computing, Numerical Analysis, Hyperbolic Conservation Laws, Computational Neuroscience, Population Dynamics, Functional Differential Equations.

Publications and Preprints

1. Santosh Kumar, Paramjeet Singh, “*Higher-order MUSCL scheme for transport equation originating in a neuronal model*”, **Computers & Mathematics With Applications**, 70 (12), 2838-2853, 2015. **SCI (Elsevier) Impact factor 1.86.**
2. Santosh Kumar, Paramjeet Singh. “*Finite volume approximation for age size structured neuron model*”, **Differential Equations and Dynamical Systems**, 25 (02), 251-265, 2017. **Scopus (Springer).**
3. Santosh Kumar, Paramjeet Singh “*High-order IMEX-WENO finite volume approximation for nonlinear age-structured population model*”, **International Journal of Computer Mathematics**, 95 (01), 82-97, 2018. **SCI (Taylor & Francis) Impact factor 1.054.**
4. Santosh Kumar, Paramjeet Singh. “*High-Order finite volume approximation for population density model based on quadratic integrate-and-fire-neuron*” **Engineering Computations**, 36 (1), 84-102, 2019. **SCI(Emerald) Impact factor 1.177.**
5. Santosh Kumar et al. “*Multiple slips effects on Magentic-Carreau fluid in a suspension of gyrotactic microorganisms over a slendering sheet*” **The Journal of Process Mechanical Engineering**, 232 (2), 254-266, 2019. **SCI (Sage) Impact factor 1.211.**
6. Santosh Kumar, Paramjeet Singh. “*High order WENO finite volume approximation for population density neuron model*” 356 , 173-189, 2019. **SCI(Elsevier) Impact factor 2.30.**
7. Santosh Kumar. “*Stability Analysis of WENO approximation for population density model*” has been communicated in SIAM journal on Numerical Analysis in 2023.

International Workshops/Conferences/Schools Attended

1. Participated and presented a talk in 9th International Congress on Industrial and Applied Mathematics (ICIAM) 2019 at Valencia Univeristy, Spain from July 15-19 2019.
2. Participated and presented a talk in PETSc Workshop (portable extensible toolkit for scientific computing) at Imperial College London , UK from June 02-06, 2018.
3. Participated and presented a talk in PETSc Workshop (portable extensible toolkit for scientific computing) at University of Colorado, USA from June 14-17, 2017.
4. Participated and presented a talk entitled *Finite volume approximation and analysis of conservation laws arising in neuronal variability* in Monash workshop on Numerical PDE's during Feb. 15-19, 2016 at Monash university, Melbourne, Australia.

5. Selection for Poster Presentation in the conference of 'Frontiers in Applied and Computational Mathematics', which is to honor the 60th Birthday of Professor Chi-Wang Shu during Jan 4-6, 2017 at Brown University RI (USA).
6. Attending in a CIMPA-LAOS research school (Introduction to the mathematical analysis of differential equations and real-life applications) during Jan. 07-13, 2017 at National University of Laos, Vientiane, Laos.

National Workshops/Conferences/Schools Attended/Orientation/Refresher Course

1. Two-week REFRESHER COURSE in Mathematics from Ramanujan College, University of Delhi, during April 29- May 13, 2023.
2. Four-week Orientation Course from Ramanujan College, University of Delhi, during May 20- June 18, 2022.
3. Presented a paper in *International conference on Recent Advances on Theoretical and Computational Partial Differential Equations* during Dec 05-09, 2016 at Panjab University Chandigarh, India
4. *Advanced Summer School on Hyperbolic Conservation Laws* during May 15- June 04, 2016 at TIFR-CAM, Bangalore, India.
5. *Advanced Level Workshop on "Integral Equations-Solvability Analysis and Applications* during October 19-25,2015 at JUIT, Solan Himachal Pradesh, India.
6. *Advanced Workshop On Finite Difference Methods For Differential Equations-2015* during march 13–17, 2015 at South Asian University, New-delhi, India.
7. *Advanced Workshop & Conference On Hyperbolic PDEs: Theory, Numerics, & Applications* during Dec 1–11, 2014 at LNMIIT, Jaipur, India.
8. *Workshop on Orthogonal Spline Collocation Methods for PDEs* at South Asian University 2014, New Delhi, India.

Education

- Ph.D. (Mathematics) from Thapar Institute of Engineering & Techonology, Patiala, India on 2018.
- M.Sc. (Mathematics) from Panjab University, Chandigarh, India in 2008 with first division.
- Under Graduation from Himachal Pradesh University, Shimla, India in 2006 with first division.
- Higher Secondary (10+2) from Himachal Board (HPBoSE), Dharamshala, India in 2003 with first division.
- Secondary (10th) from Himachal Board (HPBoSE), Dharamshala, India in 2001 with first division.

Awards, Fellowships, and Honors

- (a) **ICIAM funded travel award as well as accommodation** for presenting a research paper in 9th ICIAM 2019 in Valencia university, (Spain), July 15-19 , 2019.

- (b) **Imperial College London funded travel award as well as accommodation** for presenting a research paper in PETSc (portable extensible toolkit for scientific computations) Workshop in Imperial College London, (UK), June 02-06, 2018.
- (c) **University of Colorado funded travel award as well as accommodation** for presenting a research paper in PETSc (portable extensible toolkit for scientific computations) Workshop in University of Colorado, (USA), June 14-16, 2017.
- (d) **CIMPA funded full travel award as well as accommodation** for attending research school program in National University Laos, (Laos), January 3-13, 2017.
- (e) **The organising committee of XVI International Conference on Hyperbolic Problems funded partial travel award** for HYP2016 in Aachen (Germany), August 1-5, 2016.
- (f) **Monash University funded full travel award** for Monash workshop on Numerical PDE in Monash University, Melbourne, (Australia), February, 15-19, 2016.
- (g) **The organising committee of International Congress on Industrial and Applied Mathematics (ICIAM) funded partial travel award** for ICIAM in Beijing (China), August, 10-14, 2015.
- (h) **Senior Research Fellowship** by University Grant Commission, Government of India to pursue research as SRF-UGC from September 2015 to December 2017.
 - (i) Qualified CSIR-(NET) in Dec.2009, AIR-130.
 - (j) NBHM Phd Entrance exam cleared in. 2010.
 - (k) Qualified CSIR- UGC-JRF(NET) in June. 2011, AIR -98.
 - (l) Gate Qualified in March-2012, AIR-20 with 99.3 percentile.
- (m) Participation certificate for Quiz competition in youth festival.
- (n) Swami Vivekananda Scholarship (10,000) for meritorious student in Metric Class (10-th) and secondary class (12-th) in 2001 and 2003 resp. by the H.P. Board of School Education, Dharamshala.

Professional Membership

- Society for Industrial and Applied Mathematics (SIAM)
- SIAM activity group on Analysis of Partial Differential Equations (SIAG/APDE)
- Organization for Computational Neurosciences (OCNS)

Teaching Experience-10+ years

- Currently Working as Assistant Professor in Department of Mathematics in G. C. Kullu, Himachal Pradesh, India.
Course teaching (Current Session) :
Linear Algebra & Numerical Method in B.Sc./B.A. III year.
Algebra & Real Analysis in B.Sc./B.A. II year.
Differential Calculus & Differential Equations in B.Sc./B.A. I year.
- **Worked as Assistant Professor in Department of Mathematics in Dr. Y. S. Parmar Govt. P. G. College Nahan, Himachal Pradesh, India.**
Course teaching (Session-2018-2022):
Algebra & Real Analysis in B.Sc./B.A. II year.

Vector Calculus & Integral Calculus in B.Sc./B.A. II year.

Theory of Equations in B.Sc./B.A. IV (Semester).

Differential Calculus & Differential Equations in B.Sc./B.A. I year.

- **Worked as Assistant Professor through MHRD in Govt. (IT) Jabalpur Engineering College, Jabalpur, M.P., India** during 04, January 2018 - 30 September, 2018.

Course taught :

Advanced Engineering Mathematics in M.Tech during this period.

- **Worked as Assistant Professor in S.G.G.S.College (Sector-26) of Panjab University, Chandigarh, India** from 17-07-2009 to 30-08-2013 on contract basis.

Course taught : (2009-13)

Field Theory & Linear algebra in M.Sc. II (Mathematics) during session 2009-2013.

Real Analysis and Functional Analysis in M.Sc.I & M.Sc. II (Mathematics) respectively, during session 2009-2011

Algebra in M.Sc.I (Mathematics) during session 2012-2013.

Numerical Analysis in B.Sc. III (Mathematics) during session 2009-2013.

Calculus in B.Sc. I and Basic Mathematics to B.C.A. I (Mathematics) during session 2009-2013.

Software Exposure

- Programming Languages: MATLAB, Scilab, C, C++, python
- Text formatting: LaTeX, Open Office and Beamer
- Operating Systems: Linux

Extra Activity

1. NPTEL elite certificate holder in "**Programming C++**" with 82% organised by IIT Kharagpur in 2016.
2. NPTEL elite certificate holder in "**Numerical Computing with Matlab**" with 82% organised by IIT Madras in 2016.
3. Certificate holder in written "**QUIZ CONTEST** in Youth Festival organised by H.P.U Shimla in 2005.
4. Participated in College Cricket Team in H.P. University Championship.
5. Worked as a Center Superintendent of Panjab University Examination at D.A.V. College, Chandigarh, India,

References

1. Professor (Associate) Paramjeet Singh, School of Mathematics, Thapar Institute of Engineering & Technology, Patiala, India.
E-mail: paramjeet.singh@thapar.edu
2. Professor (Associate) Harish Garg, School of Mathematics, Thapar Institute of Engineering & Technology, Patiala, India E-mail: harish.garg@thapar.edu

3. Professor (Associate) Kapil K. Sharma, Department of Mathematics, South Asian University, New Delhi, India.
E-mail: kapil.sharma@sau.ac.in

4. Professor (Associate) Ram Jiwari, Department of Mathematics, Indian Institute of Technology Roorkee, India.
E-mail: ram1maths@gmail.com

5. Professor (Assistant) Dr. Raj Nandkeoylar, Department of Mathematics, National Institute of Technology, Jamshedpur, India.
E-mail: nandkeoylar.math@nitjsr.ac.in

6. Lecturer (Senior) Dr. Zhenquan Li, School of Computing & Mathematics Charles Sturt University, Australia.
E-mail: jali@csu.edu.au

Place: Kullu, Himachal Pradesh, India.

August 17, 2024