

## Curriculum Vitae- Dr. Suruchi Singh



### Present Affiliation:

(1999-) Assistant Professor, Department of Mathematics, Aditi Mahavidyalaya, University of Delhi, New Delhi-110039, INDIA

(19<sup>th</sup> July 2016- 18<sup>th</sup> July 2017) Research visitor at North Carolina State University, Raleigh, NC, USA

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### Previous Positions:

(July 1998- December 1999) Lecturer, Sri Ram College of Commerce, University of Delhi, INDIA

**Research Areas:** Numerical Analysis and Scientific Computing, Computational Methods for Differential Equations, Mathematical Modelling

### Academic/Professional Qualifications:

- B.A.(Hons.) Mathematics(1995) Laxmi Bai College, University of Delhi, INDIA
- M.A.(Mathematics)(1997), Ramjas College, University of Delhi, INDIA
- M.Phil.(1999), University of Delhi, INDIA
- Ph.D.(2012), University of Delhi, INDIA

### Courses taught:

**Undergraduate Level:** Calculus, Differential Equations, Mathematical Modelling, Probability, Mathematical Statistics, Numerical Analysis, Real Analysis, Coordinate Geometry, Algebra, Computer Algebra Systems.

### Awards/Honours:

- *Shrimati Sivakamma Radhakrishnan Medal* for being the best women candidate in M.A. Examination in University of Delhi held in 1997.
- *Professor Ram Bihari Medal* for being the best candidate in M.A./M.Sc.(Mathematics) Examination in University of Delhi held in 1997.

- ***J.N. Mitra Memorial Medal*** for being the best candidate in M.A./M.Sc. Examination in University of Delhi in Mathematics, Statistics, Physics (taken together) held in 1997.
- ***Shri Ram Chandra Memorial Medal*** for being the best candidate in M.A./M.Sc. (All Subjects) Examination in University of Delhi held in 1997.
- **Got Junior Research Fellowship in M.Phil. from U.G.C./C.S.I.R.**
- **Visited North Carolina State University, Raleigh, NC, USA during the period 19th July 2016 to 18th July, 2017 under RAMAN FELLOWSHIP to carry out advanced Research in ‘Computational Methods for Differential Equations’.**

### **Conferences/Workshops attended:**

- (a) Participated in the International Conference on “Function Spaces and Applications to Partial Differential Equations” organized by the Department of Mathematics, University of Delhi, Delhi at South Campus during December 15-19, 1997.
- (b) Participated in the conference on “Functional Analysis and its Applications” organized by the Department of Mathematics, University of Delhi, during January 22-25, 1999.
- (c) Participated and presented a paper entitled “High Accuracy Numerov Type Discretization for the Solution of One Space Dimensional Non-Linear Wave Equation with Variable Coefficients” in the National Seminar for research scholars held at Department of Mathematics, University of Delhi during March 24-25, 2012.
- (d) Participated in “International Conference on the Legacy of Srinivasa Ramanujan” conducted by Department of Mathematics, University of Delhi from January 17-22, 2012.
- (e) Participated in “Symposium on Computational Techniques and Mathematical Modeling” conducted by the Department of Mathematics, South Asian University from April 5-6, 2013.
- (f) Participated in the workshop on “Information Technology” conducted by C.P.D.H.E., University of Delhi from May 28-30, 2013.
- (g) Attended the Fall Meeting of the MD-DC-VA section of the MAA (Mathematical Association of America, Maryland-District of Columbia- Virginia Section) held at Johns Hopkins University, Baltimore, USA from November 4-5, 2016.
- (h) Attended the Fall Southeastern Sectional Meeting of American Mathematical Society held at North Carolina State University, Raleigh, USA from November 12-13, 2016.

- (i) Attended the JOINT MATHEMATICS MEETING 2017 organized by American Mathematical Society and Mathematics Association of America at Atlanta, GA, USA during January 4-7, 2017 and acted as one of the judges for the undergraduate student poster presentations of the Mathematical Association of America (MAA) on January 6, 2017 at the Joint Mathematics Meetings, Atlanta, GA.
- (j) Delivered a talk on “Exponential B-Spline Collocation Method for Hyperbolic Partial Differential Equations” at Department of Mathematics, North Carolina University, Greensboro, USA on 22<sup>nd</sup> February, 2017.
- (k) Attended a DEMARC Developer Workshop at Manhattan College, New York NY, from 15 - 21 July 2018.
- (l) Organized SCUDEM-2018 (SIMIODE Challenge Using Differential Equations Modeling) at Aditi Mahavidyalaya in Collaboration with SIMIODE (Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations) U.S.A.

### **Professional Societies:**

American Mathematical Society

Ramanujan Mathematical Society

Indian Mathematical Society

### **Books written:**

1. Co-authored a book “Solid State Geometry” published by “Macmillan India Ltd.” In January 2006.
2. Co-authored a book “Concepts of Mathematics: Level 1” for High School students in 2015.
3. Co-authored a book “Concepts of Mathematics: Level 2” for High School students in 2015.

### **List of Publications in International Journals:**

- [1] R.K. MOHANTY and **SURUCHI SINGH**, “High Accuracy Numerov Type Discretization for the Solution of One Space Dimensional Non-Linear Wave Equation with Variable Coefficients”, *Journal of Advanced Research in Scientific Computing*, Vol. 03, pp. 53-66 (2011).
- [2] R.K. MOHANTY and **SURUCHI SINGH**, “A New High Order Approximation for the Solution of Two-Space Dimensional Quasi-Linear Hyperbolic Equations”, *Advances in Mathematical Physics*, Vol. 2011, Article ID 420608, 22 pages, doi:10.1155/2011/420608 (2011).
- [3] R.K. MOHANTY and **SURUCHI SINGH**, “High Order Variable Mesh Approximation for the Solution of 1D Quasi-Linear Hyperbolic Equations”, *International Journal of Nonlinear Science*, Vol. 14(No.2), pp. 220-227 (2012).

- [4] **SURUCHI SINGH**, SWARN SINGH and R.K. MOHANTY, “High Accuracy Cubic Spline Approximation on a Geometric Mesh for the Solution of 1D Non-linear Wave Equations”, *Journal of Mathematical and Computational Science*, Vol. 2, No.4, pp. 1126-1143 (2012).
- [5] R.K. MOHANTY, M.K.JAIN and **SURUCHI SINGH**, “A New Three- Level Implicit Cubic Spline Method for the Solution of 1D Quasi-Linear Hyperbolic Equations”, *Computational Mathematics and Modeling*, Vol. 24(No.3), pp. 452-470 (2013).
- [6] SWARN SINGH, **SURUCHI SINGH**, and R.K. MOHANTY, “A New High Accuracy Off-Step Discretisation for the Solution of 2D Non-linear Triharmonic Equations”, *East Asian Journal on Applied Mathematics*, Vol. 3(No. 3), pp. 228-246 (2013).
- [7] R.K. MOHANTY, **SURUCHI SINGH** and SWARN SINGH, “A New High Order Space Derivative Discretization for 3D Quasi-linear Hyperbolic Partial Differential Equations”, *Applied Mathematics and Computation*, Vol. 232, pp. 529-541 (2014).
- [8] RAJNI ARORA, **SURUCHI SINGH** and SWARN SINGH, “Exponential B-spline Collocation for the Numerical Solution of One Space Dimensional Non- linear Wave Equation with Strong Stability Preserving Time Integration”, *International Journal of Advanced Research in Science and Technology*, Vol. 4, Issue 11 pp. 102-113(2015).
- [9] NEHA SHARMA, SWARN SINGH and **SURUCHI SINGH**, “Optimizing the Power Required in Hyperthermia Treatment using Magnetic Nanoparticles”, *International Journal of Control and Automation*, Vol. 9, Issue 9, pp. 181-188 (2016).
- [10] SWARN SINGH, **SURUCHI SINGH** and RAJNI ARORA, “New Highly Accurate Stable Schemes for the Solution of Telegraphic Equation with Neumann Boundary Conditions”, *Neural Parallel and Scientific Computations*, Vol. 24, pp. 1-14(2016).
- [11] SWARN SINGH, **SURUCHI SINGH** and RAJNI ARORA, “Numerical Solution of Second-order One- Dimensional Hyperbolic Equation by Exponential B-spline Collocation Method”, *Numerical Analysis and Applications*, Vol. 10, Issue 2, pp. 164-176(2017).
- [12] **SURUCHI SINGH**, SWARN SINGH and ZHILIN LI, “A High Order Compact Scheme for a Thermal Wave Model of Bio- Heat Transfer with an Interface”, *Numerical Mathematics: Theory Methods and Applications*, Vol. 11, Issue 2, pp. 321-337 (2018).
- [13] **SURUCHI SINGH**, KAZUFUMI ITO, SWARN SINGH and ZHILIN LI, “A fourth order compact scheme for transport equation with discontinuous coefficients”, *Numerical Mathematics: Theory Methods and Applications*, Vol. 11, Issue 4, pp. 782-794 (2018).
- [14] SWARN SINGH, **SURUCHI SINGH**, RAJNI ARORA and PING LIN, “Unconditionally stable modified methods for the solution of two and three dimensional telegraphic equation with Robin boundary conditions”, *Numerical Methods for Partial Differential Equations*, Vol. 35, Issue 1, pp. 246-266 (2019).

- [15] SWARN SINGH, **SURUCHI SINGH** and RAJNI ARORA, “An Unconditionally Stable Numerical Method for the Solution of two Dimensional Second Order Hyperbolic Equation”, *East Asian Journal on Applied Mathematics*, Vol. 9, Issue 1, pp. 195-211 (2019).
- [16] SWARN SINGH, **SURUCHI SINGH**, RAJNI ARORA and PING LIN, “Unconditionally stable modified methods for the solution of two and three dimensional telegraphic equation with Robin boundary conditions”, *Numerical Methods for Partial Differential Equations*, Vol. 35, Issue 1, pp. 246-266 (2019).
- [17] SWARN SINGH, **SURUCHI SINGH** and RAJNI ARORA, “An Unconditionally Stable Numerical Method for the Solution of two Dimensional Second Order Hyperbolic Equation”, *East Asian Journal on Applied Mathematics*, Vol. 9, Issue 1, pp. 195-211 (2019).
- [18] **SURUCHI SINGH** and SWARN SINGH, “High order convergent modified nodal bi-cubic spline collocation method for elliptic partial differential equation”, *Numerical Methods for Partial Differential Equations*, Vol. 36, Issue 5, pp. 1028-1043(2020).
- [19] RAJNI ARORA, SWARN SINGH and **SURUCHI SINGH**, “Numerical solution of second-order two-dimensional hyperbolic equation by bi-cubic B-spline collocation method”, *Math Sci*, Vol. 14, pp. 201-213(2020).
- [20] Published an article on “Skin Burn Model - Numerical Methods”, A Systemic initiative for modelling investigations and opportunities with differential equations (2018).