

# CURRICULUM VITAE

## Dr. Brajesh Kumar Singh

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## Educational Profile

Qualification	Board / University / Institute	Year	
Ph.D.	Indian Institute of Technology Roorkee, INDIA	2012	Awarded
<b>RESEARCH AREA: -CRYPTOGRAPHY</b>			
<b>THESIS TITLE :- SOME PROBLEMS ON BOOLEAN FUNCTIONS AND THEIR GENERALIZATIONS</b>			
M.Sc.	PPN PG College Kanpur (CSJM Uni. Kanpur)	2005	69.70%
B.Sc.	Nehru PG College Chhibramau (CSJM Uni. Kanpur)	2003	70.60%
Intermediate	BBHB Inter College Talgram, Kannauj (UP Board)	2000	76.80%
High School	Shri PVM Inter College Tahpur, Farrukhabad(UP Board)	1998	72.50%

**NET Qualified.** NET-JRF (UGC-CSIR): Dec 2007

## PROFESSIONAL DETAILS

**Experience:** i) Teaching: Year(s) 08 Month(s) 04  
ii) Reseach: Year(s) 12 Month(s) 05

**Qualifications:** M. Sc. (Mathematics) and Ph. D. (Cryptography)

**Skills:** Teaching and Research

**Area of Interest:** Real Analysis, Linear Algebra, Differential Eqns and Numerical Techniques, Numerical Analysis

**Specialization:** : Cryptography & Numerical Analysis

## SCHOLASTIC ACHIEVEMENTS

i) Junior Research Fellow (CSIR fellowship) August, 2008 to July 2010, IIT Roorkee  
ii) Senior Research Fellow (CSIR fellowship) August, 2010 to August 2012, IIT Roorkee

## COMPUTER SKILLS

i) Mathematical Software Mathematica, Matlab  
ii) Typesetting Software: Microsoft Word, LaTeX  
iii) Programming Language Matlab, C, C++

## **ACADEMIC EXPERIENCE (EMPLOYMENT DETAILS)**

<b>Institution</b>	<b>Time Duration</b>	<b>Remark</b>
1. Graphic Era University, Dehradun	30-09-12 to 23-03-15	Assistant Professor
2. Babasaheb Bhimrao Ambedkar University, Lucknow	24-03-15 to Continue	Assistant Professor

## **RESEARCH INTEREST/SPECILIZATION**

1. Numerical Analysis
2. Numerical simulation of nonlinear differential equations
3. Fractional analysis
4. Study of fractional differential equations

## **REVIEWER IN INTERNATIONAL JOURNALS**

1. Fractals (World Scientific's Journal)
2. International Journal of Computer Mathematics (Taylor and Francis)
3. Abstract and Applied Analysis (Hindawi)
4. Cryptography and Communications - Discrete Structures, Boolean Functions and Sequences (Springer)
5. Advances in Difference Equations (Springer)
6. Chaos, Solitons & Fractals (Elsevier)

## **PAPERS PUBLISHED IN INTERNATIONAL JOURNALS**

1. **Stanica P., Martinsen T., Gangopadhyay S. & Singh B. K. (2013)** Bent and Generalized Bent Boolean functions. *Designs, Codes and Cryptography* 69(1) (2013) 77-94. (Springer)
2. **Gangopadhyay S. & Singh B. K. (2012)** On second-order nonlinearities of some D0 type bent functions. *Fundamenta Informaticae* 114 (3-4) (2012) 271-285. IOS Press
3. **Singh B. K. (2010):** On construction of cubic Boolean functions with good second-order nonlinearity, *Int. J. Comput. Sci. Inform. Technol.* 3(1) (2010) 27-32.
4. **Arora G., Singh B. K. (2013)** Numerical solution of Burgers' equation with modified cubic B-spline differential quadrature method. *Applied Mathematics and Computation* 224 (2013) 166-177. (Elsevier)
5. **Singh D., Bhanitwal M. & Singh B. K. (2013):** Some results on q-ary bent functions. *International Journal of Computer Mathematics* 90(9) (2013) 1761-1773. (Taylor & Francis)
6. **Singh B. K. (2014):** On second-order nonlinearity and maximum algebraic immunity of some bent functions in PS+. *Journal of Applied Mathematics and Computing* 46(1-2) (2014) 335-349 (Springer).
7. **Srivastava V.K., Mishra N., Kumar S., Singh B. K. & Awasthi M.K. (2014)** Reduced differential transform method for solving (1+n)- Dimensional Burgers' equation. *Egyptian Journal of Basic and Applied Sciences*, 1(2) (2014) 115-119 (Elsevier)
8. **Singh D., Bhanitwal M. & Singh B. K. (2015):** Constructions of q-ary functions with good global avalanche characteristics. *International Journal of Computer Mathematics*, 92(2)(2015) 266-276. (Taylor & Francis)

9. **Srivastava V.K., Kumar S., Awasthi M.K. & Singh B. K. (2014)** Two-dimensional time fractional-order biological population model and its analytical solution, **Egyptian Journal of Basic and Applied Sciences** 1 (2014) 71-76. (Elsevier)
10. **Singh B. K. (2013)** On cross-correlation spectrum of generalized bent functions in generalized Maiorana-McFarland class. **Information Sciences Letters** 2(3) (2013) 139-145. (Natural Sciences)
11. **Singh B. K. (2014)** Generalized semi-bent and partially bent Boolean functions. **Mathematical Sciences Letters** 3(1) (2014) 21-29. (Natural Sciences)
12. **Singh B. K. (2014)** On third-order nonlinearities of biquadratic monomial Boolean functions, **International Journal of Engineering Mathematics**, Volume 2014, Article ID 937386, 7 pages, <http://dx.doi.org/10.1155/2014/937386>.
13. **Arora G., Mittal R.C., Singh B. K. (2013)** Numerical Solution of BBM-Burger Equation with Quartic B-spline Collocation Method, **J. Engg. Sci. Tech.**, <http://jestec.taylors.edu.my/Special%20Issue%20ICMTEA2013.htm>
14. **Singh B. K., Arora G., Kumar P. (2018)** A note on solving the fourth-order Kuramoto-Sivashinsky equation by the compact finite difference scheme, **Ain Shams Engineering Journal**, Volume 9, Issue 4, December 2018, Pages 1581-1589. (Elsevier)
15. **Singh B. K., Arora G. (2014)** A numerical scheme to solve Fisher-type reaction-diffusion equations (An Extended Version of ICMTEA-2013), **Nonlinear Studies/MESA - MATHEMATICS IN ENGINEERING, SCIENCE AND AEROSPACE** 5(2) (2014) 153-164.
16. **Srivastava V.K., Singh B. K. (2014)** A Robust finite difference scheme for the numerical solutions of two dimensional time-dependent coupled nonlinear Burgers' equations, **International Journal of Applied Mathematics and Mechanics**, 10(7) (2014) 28-39.
17. **Singh B. K., Srivastava V.K. (2015)** Approximate series solution of multi-dimensional, time fractional-order (heat-like) diffusion equations using FRDTM, **Royal Society Open Sciences** 2: 140511, 2015. <http://dx.doi.org/10.1098/rsos.140511>.
18. **Bhadauria, B.S., Singh A., Singh M.K., & Singh B. K. (2016)** Stability analysis and internal heating effects on oscillatory convection in a viscoelastic fluid layer under gravity modulation, **Asia Pacific Journal of Engineering Science and Technology** 2 (2) (2016) 1-22.
19. **Singh B. K., Bianca C. (2015)** A New Numerical Approach for the Solutions of Partial Differential Equations in Three-Dimensional Space, **Appl. Math. Inf. Sci.** 10, No. 5, 1-10 (2016).
20. **Singh B. K., Kumar P. & Kumar V. (2016)** An approximate analytical solution approach for solving time-Fractional order Black-Scholes Option pricing equation, **Asia Pacific Journal of Engineering Science and Technology** 2 (3) (2016) 15-27.
21. **Singh B. K., Arora G. & Singh M.K. (2016)** A numerical scheme for the generalized Burgers-Huxley equation, **Journal of the Egyptian Mathematical Society**, Volume 24, Issue 4, October 2016, Pages 629-637. <http://dx.doi.org/10.1016/j.joems.2015.11.003>.
22. **Singh M.K., Bhadauria, B.S. & Singh B. K. (2016)** Optimal harvesting of a ratio-dependent predator-prey model with strong Allee effect, **Asia Pacific Journal of Engineering Science and Technology** 2 (4) (2016) 1-23.

23. **Singh M.K., Bhadauria, B.S. & Singh B. K. (2016)** Qualitative analysis of a Leslie-Gower predator-prey system with nonlinear harvesting in predator, **Int. Journal of Engineering Mathematics**, Volume 2016, Article ID 2741891, 15 pages <http://dx.doi.org/10.1155/2016/2741891>
24. **Singh M.K., Bhadauria, B.S. & Singh B. K. (2018)** Bifurcation analysis of modified Leslie-Gower predator-prey model with double Allee effect, **Ain Shams Engineering Journal**, Volume 9, Issue 4, December 2018, Pages 1263-1277.
25. **Singh B. K., Kumar P. (2018)** FRDTM for numerical simulation of multi-dimensional, time-fractional model of Navier-Stokes equation, **Ain Shams Engineering Journal** , Volume 9, Issue 4, December 2018, Pages 827-834
26. **Kumar P., Singh B. K., Rai S.N. (2016)** A numerical computation of Fokker-Planck Equation using modified cubic B-spline differential quadrature method, **Journal of Mathematics and System Science (2016)**, ISSN 2159-5291, USA.
27. **Singh B. K., Kumar P. (2016)** Numerical computation for time-fractional gas dynamics equations by fractional reduced differential transforms method, **Journal of Mathematics and System Science (2016)**, ISSN 2159-5291, USA.
28. **Singh B. K. (2016)** A novel approach for numeric study of 2D biological population model, Singh, **Cogent Mathematics (2016)**, 3: 1261527 <http://dx.doi.org/10.1080/23311835.2016.1261527>.
29. **Bhadauria, B.S., Singh M.K., Singh A., Singh B. K. & Kiran P. (2016)** Stability Analysis and internal heating effect on oscillatory convection in a viscoelastic fluid saturated FLUID SATURATED POROUS MEDIUM UNDER GRAVITY MODULATION, **Int. J. of Applied Mechanics and Engineering**, 2016, vol.21, No.4, pp.785-803, [DOI: 10.1515/ijame-2016-0046](https://doi.org/10.1515/ijame-2016-0046)
30. **Singh B. K., Kumar P. (2016)** A novel approach for numerical computation of Burgers' equation in  $(1 + 1)$  and  $(2 + 1)$  dimensions, **Alexandria Engineering Journal Volume 55**, Issue 4, December 2016, Pages 3331-3344.
31. **Singh B. K., Kumar P. (2017)** Fractional Variational Iteration Method for Solving Fractional Partial Differential Equations with Proportional Delay, **International Journal of Differential Equations**, Volume 2017, Article ID 5206380, 11 pages, <https://doi.org/10.1155/2017/5206380>.
32. **Singh B. K., Kumar P. (2018)** An algorithm based on DQM with modified trigonometric cubic B-splines for solving coupled viscous Burger's equations, **Communications in Numerical Analysis**, Volume 2018, Issue 1, Year 2018 Article ID cna-00333, Pages 21-41, Published: 02 April 2018.
33. **Singh B. K., Mahendra (2016)** A Numerical Computation of a System of Linear and Nonlinear Time Dependent Partial Differential Equations Using Reduced Differential Transform Method, **International Journal of Differential Equations**, Volume 2016, Article ID 4275389, 8 pages, <http://dx.doi.org/10.1155/2016/4275389>.
34. **Singh, B.K., Kumar P (2017)** Extended Fractional Reduced Differential Transform for Solving Fractional Partial Differential Equations with Proportional Delay. *Int. J. Appl. Comput. Math* **3**, 631–649 (2017). <https://doi.org/10.1007/s40819-017-0374-9>

35. **Singh, B.K. (2016)** Fractional reduced differential transform method for numerical computation of a system of linear and nonlinear fractional partial differential equations, **Int. J. Open Problems Compt. Math.**, Vol. 9, No. 3, September 2016.
36. **Bhadauria, B.S., Kumar V., Singh M.K., Hashim I. (2016)** Study of convective thermal instability in nanofluid saturated porous media in flow, internal heat source and rotation, **Vijnana Bharathi, The frontier journal in science**, Volume 1, issue 2, March 2016. ISSN: 0971-6882.
37. **Singh, B.K., Kumar P (2018)** An algorithm based on a new DQM with modified extended cubic B-splines for numerical study of two dimensional hyperbolic telegraph equation, **Alexandria Engineering Journal**, Volume 57, Issue 1, March 2018, Pages 175-191.
38. **Singh, B.K., Kumar P (2018)** Homotopy perturbation transform method for solving fractional partial differential equations with proportional Delay, **SeMA Journal (2018) 75:111–125** <https://doi.org/10.1007/s40324-017-0117-1>. (Springer)
39. **Singh, B.K., Kumar P., Kumar V. (2018)** Homotopy Perturbation Method for Solving Time Fractional Coupled Viscous Burgers' Equation in (2+1) and (3+1) Dimensions, **Int. J. Appl. Comput. Math (2018) 4: 38**. <https://doi.org/10.1007/s40819-017-0469-3>. (Springer)
40. **Singh, B.K. (2018)** Homotopy perturbation new integral transform method for numeric study of space and time- fractional (n+1)-dimensional heat and wave-like equations, **Waves, Wavelets and Fractals 2018; 4:19–36**. <https://doi.org/10.1515/wwfaa-2018-0003>.
41. **Singh, B.K., Gupta, M. (2019)** A comparative study of analytical solutions of space-time fractional hyperbolic-like equations with two reliable methods, **Arab Journal of Basic and Applied Sciences**, 2019, 26(1), pp. 41–57.
42. **Singh, B.K., Agrawal, S. (2020)** A new approximation of conformable time fractional partial differential equations with proportional delay, **Applied Numerical Mathematics**, 2020, 157, pp. 419–433. (Elsevier)
43. **Singh, B.K., Shukla, J.P., Gupta, M. (2021)** Study of One Dimensional Hyperbolic Telegraph Equation Via a Hybrid Cubic B-Spline Differential Quadrature Method, **International Journal of Applied and Computational Mathematics**, 2021, 7(1), 14. (Springer)
44. **Singh, B.K., Gupta, M. (2021)** A new efficient fourth order collocation scheme for solving Burgers' equation, **Applied Mathematics and Computation**, <https://doi.org/10.1016/j.amc.2021.126011>

## **PUBLISHED BOOK CHAPTERS**

1. **Singh B.K., Kumar A. (2020)**. Numerical Study of Conformable Space and Time Fractional Fokker–Planck Equation via CFDT Method. In: Deo N., Gupta V., Acu A., Agrawal P. (eds) *Mathematical Analysis II: Optimisation, Differential Equations and Graph Theory*. ICRAPAM 2018. Springer Proceedings in Mathematics & Statistics, vol 307. Springer, Singapore. [https://doi.org/10.1007/978-981-15-1157-8\\_19](https://doi.org/10.1007/978-981-15-1157-8_19)

2. **Singh, B.K., Agrawal, S. (2019)** Study of Nonlinear Time Fractional Generalized Burger Equation with Proportional Delay via q-HAM, Proceedings of "International Conference on Applied Mathematics & Computational Sciences" (ICAMCS-2019) October 17th–19th, 2019. <https://doi.org/10.21467/proceedings.100>
3. **Singh B.K., Kumar P & Arora G. (2015).** Analysis of Predator-Prey model in the presence of Allee-Effect II, Recent Advances in Mathematical and computational Sciences, Chapter 2, 29-53, 2015, ISBN 978-93-84337-67-4.
4. **Singh B.K., Kumar P & Arora G. (2015).** Modified Cubic B-spline differential quadrature method to solve one dimensional fisher's reaction diffusion equation, Recent Advances in Mathematical and computational Sciences, Chapter 3, 29-53, 2015, **ISBN 978-93-84337-67-4.**
5. **Bhadauria B.S., Singh A., Singh M. K. & Singh B.K. (2015).** Numerical Study on Chaotic convection in a viscoelastic fluid saturated porous medium under temperature modulation, Recent Advances in Mathematical and computational Sciences, Chapter 4, 55-75, 2015, **ISBN 978-93-84337-67-4.**
6. **Bhadauria B.S., Singh V. & Singh B.K. (2015).** Week nonlinear stability analysis of thermal convection in an electrically conducting nanofluid layer under magnetic field modulation, Recent Advances in Mathematical and computational Sciences, Chapter 11, 155-174, 2015, **ISBN 978-93-84337-67-4.**

## **PAPERS PRESENTED IN NATIONAL OR INTERNATIONAL CONFERENCES**

1. **Gangopadhyay S., Pasalic E. & Singh B. K. (2013)** On upper bounds on algebraic immunity of some PSap and Niho bent functions. **Proceedings of IEEE Explore in 8th International Conference on Communication and Networking, Guilin, China, August 14-16, 2013, CHINACOM 2013, 379-383. (Elsevier)**
2. **Gangopadhyay S., Singh B. K. (2010)** On second-order nonlinearities of some D0 type bent functions, **presented in 10th Central European Conference on Cryptology, CCEC-2010, Bedlewo Poland, 10-12 June 2010, pp. 17-18.**
3. **Singh B. K. (2010)** On construction of cubic Boolean functions with good second-order nonlinearity, **presented in National Conference on Networking and Information Security, NCNIS-2010, SMIT, Sikkim, 27-29 March, 2010.**
4. **Singh B. K., Gangopadhyay S. (2010)** Lower bounds on second-order nonlinearities of some bent functions in D0 class, **presented in 11th National Workshop on Cryptology, NWC-2011, NIIT University Neemrana India, 23-24 September, 2011.**
5. **Singh B. K., Arora G. (2013)** A numerical scheme to solve Fisher-type reaction-diffusion equations, **in International Conference on Mathematical Techniques in Engineering Applications ICMTEA-2013, October 24-25, 2013 at Graphic Era University Dehradun INDIA.**
6. **Singh B. K., Arora G. (2013).** Solution of Klein-Gordon Equation by modified cubic B-spline differential quadrature method, **in International Conference on History and Development of Mathematics ICHDM-13, November 29 to December 1, 2013 at JECRC University Jaipur INDIA.**

## **PROGRAM(S)/CONFERENCE(S) ATTENDED/ORGANIZED**

1. **Convener** of National conference on mathematical techniques in engineering and technology (MTET-2016) March 30-31, 2016 at Babasaheb Bhimrao Ambedkar University Lucknow, India.
2. Attend Induction Training Program from March 11, 2013 to March 15, 2013 at Graphic Era University, Clement Town Dehradun through ICT from National Technical Teacher Training and Research Institute, Chandigarh.
3. **Arora G., Singh B.K. & Kimothi S. (2013)** Organize “a workshop on Digital & Aerial Photography” April 24, 2013, Graphic Era Hill University Dehradun, INDIA.
4. **Singh B. K. (2009)** Participate in Pre-Conference Tutorial of 10th International Conferences on Cryptology in INDIA, “INDOCRYPT-2009”, held on Dec. 13, 2009, New Dehli INDIA.

## **Personal Details**

<b>Father's Name</b>	Shri Shiv Nath Singh
<b>Mother's Name</b>	Smt Ramveti
<b>Place (Date) of Birth</b>	Kannauj(UP) (05 – 01 -1984)
<b>Gender/ Category</b>	Male / Gen-PH
<b>Permanent address</b>	Vill – Bariyapurwa, Post- Amolar, District – Kannauj, 209731 (UP) India
<b>Language Known</b>	: Hindi & English
<b>Marital Status</b>	Married

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**Declaration.** I confirm that all the above stated particulars in this Resume are true to the best of my knowledge and that I can provide documentary evidence to verify all the given information.

Place: Lucknow  
Date: 28/01/2021

Dr. Brajesh Kumar Singh  
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BBA University Lucknow