

CURRICULUM -VITAE

Dr. UADAY SINGH, Ph. D.

Professor, Department of Mathematics
Indian Institute of Technology Roorkee
Roorkee-247667, Uttarakhand, India

Telephone: +91 1332 285430

Mobile: +91 9453551769

Email: uadayfma@iitr.ac.in

https://ma.iitr.ac.in/~MA/Uaday_Singh

CURRENT POSITION:

Professor in Mathematics

AREAS OF RESEARCH INTEREST: Real Analysis, Approximation by Fourier series, Neural Networks, Singular Integrals and Summability Methods.

EMPLOYMENTS AND EXPERIENCE:

1. Worked as an Associate Professor in the Department of Mathematics, IIT Roorkee, Roorkee from 23rd November, 2015 to March 17, 2025.
2. Worked as an Assistant in the Department of Mathematics, IIT Roorkee, Roorkee from 19th November, 2010 to 22 November 2015.
3. Worked as an Assistant Professor in the Department of Mathematics, Faculty of Science, Banaras Hindu University, Varanasi, from 21st January, 2006 to 18th November 2010 [on lien from November 2007 to December 2009 to join ISM Dhanbad as an Assistant Professor].
4. Worked as a Lecturer in the Department of Education in Science & Mathematics, NCERT, New Delhi from 10th November, 2003 to 20th January, 2006.

EDUCATIONAL QUALIFICATIONS:

1. Ph. D. on the topic 'Fourier Approximation in $L_p(p \geq 1)$ - Spaces Using Summability Techniques' from Chaudhary Charan Singh University, Meerut and IIT Roorkee in 2007.
2. Master of Science (Mathematics) from Chaudhary Charan Singh University, Meerut, Uttar Pradesh in 2001 with 1st division.
3. Bachelor of Science from Chaudhary Charan Singh University, Meerut, Uttar Pradesh in 1999 with 1st division.
4. CSIR-UGC, National Eligibility Test-December 2001 and June 2002 with the award of Junior Research Fellowship.

RECENT TEACHING INTERESTS:

Elementary Real Analysis
Mathematics-I for B. Tech students
Approximation Theory
Differential Geometry
Linear Algebra

Ph. D. SUPERVISION:

Sl. No.	Topic/Title	Year of Award	Name of Scholar	Name of Co-supervisor
1.	Approximation Theory	On going	Mr. Abhishek Yadav	-
2.	Approximation Theory	On going	Mr. Sachin Kumar	-
3.	Approximation by neural network operators	On going	Ms. Manju Sharma	-
4.	Approximation by singular integrals	2025	Mr. Abhay Pratap Singh	-
5.	Order of convergence of certain positive linear operators	2022	Mr. Sompal Singh	Prof. (Retd.) P. N. Agrawal, IIT Roorkee
6.	Degree of approximation by certain positive linear operators.	2021	Mr. Dharmendra Kumar	Prof. (Retd.) P. N. Agrawal, IIT Roorkee
7.	Fourier approximation in certain function spaces	2021	Mr. Birendra Singh	-
8.	Fourier series approximation by linear operators in L_p – norm	2019	Mrs. Arti	-
9.	Fourier series approximation of functions in L_p ($p \geq 1$) – spaces	2018	Mrs. Soshal	-
10.	Some problems on trigonometric approximation in L_p ($p \geq 1$)-spaces	2015	Mr. Shailesh Kr. Srivastava	-
11.	Mathematical modeling for magnetic drug targeting	2015	Mrs. Shashi Sharma	Prof. (Retd.) V. K. Katiyar
12.	Some problems on approximations in L_p ($p \geq 1$)-spaces	2013	Mrs. Smita Sonker	Prof. (Retd.) M. L. Mittal, IIT Roorkee

UG/PG PROJECT GUIDENCE:

Post Graduate: 32

Under Graduate: 22

RESEARCH/CONSULTANCY PROJECTS HANDELED:

1. 'Exploring Constructive Approximation within the Framework of Neural Network Operators' funded by ANRF, 2025-2028.
2. 'A Study of Convergence Properties of the Corrected Fourier Series and its Applications (2022-2025) under MATRICS funded by Science and Engineering Research Board, Department of Science and Technology, Government of India.
3. 'Teachers Associateship for Research Excellence (TARE)' Scheme (2021-2022) funded by Science and Engineering Research Board, Department of Science and Technology, Government of India.
4. 'Fourier Approximation in Certain Function Spaces' (2014-2018), funded by Science and Engineering Research Board, Department of Science and Technology, Government of India.
5. 'Some Problems on Fourier Approximation in Banach Spaces' (2014-2017), funded by the National Board for Higher Mathematics, Department of Atomic Energy, Government of India.
6. Developed a Pedagogy Course on Engineering Mathematics with Prof. P. N. Agrawal, 2013-2016 Coordinated by IIT Kharagpur.

MEMBERSHIP OF PROFESSIONAL BODIES:

1. Regular member of American Mathematical Society (AMS)
2. Life member of Forum D' Analyses
3. Life member of Indian Mathematical Society (IMS)
4. Life member of International Society for Analysis, its Applications and Computation (ISAAC)
5. Life Member of Indian Science Congress Association (ISCA)

ORGANIZATION OF WORKSHOP/CONFERENCE:

1. Worked as convener of International Symposium on Recent Advances in Computational Analysis and Modelling organized at IIT Roorkee under 175th Years celebration during June 20-24, 2022.
2. Worked as Co-convener of One Week Short Term Course on Complex Analysis, Fourier Series and Special Functions, March 6-10, 2017.
3. Worked as Co-convener of the International Conference on Mathematical Analysis and Its Applications, November 28-December 02, 2016.
4. Worked as Co-convener of One Week Short Term Course on Mathematical Analysis and Applications, July 4-8, 2016.
5. Worked as Co-convener of One Day Workshop on Applicable Analysis, March 05, 2016.
6. Worked as Co-convener of the International Conference on Recent Trends in Mathematical Analysis and Its Applications, December 21-23, 2014.

RESEARCH COLLABORATION:

1. Prof. Danilo Costarelli, Department of Mathematics and Computer Science, University of Perugia, Via Vanvitelli 1, Perugia, 06123, Italy. (Working on a problem of multidimensional neural network operators)
2. Prof. W. Łenski and Prof. B. Szal, Faculty of Mathematics, Computer Science and Econometrics, University of Zielona Góra, Ulica Szafrana 4a, 65-516, Zielona Góra, Poland. (Working on approximation of almost periodic functions).

PARTICIPATION IN COURSE/SEMINARS/CONFERENCES:

1. Participated in Two-Day Workshop on Pedagogy to Promote Design & Entrepreneurship. March 28-29, 2025 at IIT Roorkee.
2. Participated and presented a paper in the workshop SIGMA (Signal - Image - Geometry - Modelling - Approximation)-2024 at CIRM, Luminy, France during October 28-November 01, 2024.
3. Participated and gave a talk in the conference Constructive Approximation of Functions 4 at Institute of Mathematics of Polish Academy of Sciences, Warsaw during June 25-28, 2024.
4. Participated and gave a talk in the 14th ISAAC Congress at the University of Sao Paulo, Brazil during July 17-21, 2023.

5. Delivered a guest lecture on the occasion of National Mathematics Day at Central University of Punjab, December 22, 2022.
6. Delivered an invited talk in the 4th National Conference on Recent Advancement in Physical Sciences (NCRAPS-2022) at NIT Uttarakhand, December 19-20, 2022.
7. Presented a research paper on Rate of Convergence of Matrix Means of Corrected Fourier Series in 3rd International Conference on Subdivision, Geometric and Algebraic Methods, Isogeometric Analysis and Refinability held in Rimini (Italy), September 20-24, 2022.
8. Participated as a resource person in e-Short Term Training Programme on ALGEBRA AND ANALYSIS organised by Department of Mathematics, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India during December 13-18, 2021 (Online).
9. Presented a paper in International Congress on Fundamental and Applied Sciences (ICFAS-2021), 19-21 October, 2021 Antalya, Turkey (Online).
10. Participated as an invited speaker in International Conference on Mathematical Sciences (ICMS-2021), SVNIT Surat during October 07-09, 2021. (Online)
11. Delivered a talk in Prof. I. H. Sheth Mathematics Lecture Series, Gujrat University, on February 06, 2021(Online).
12. Participated as an invited speaker in VIRTUAL INTERNATIONAL CONFERENCE ON PHYSICAL SCIENCES (ICPS – 2021), SVNIT Surat during February 5-6, 2021 (Online).
13. Presented a paper in the International Workshop on Operator Theory and its Applications held at Chemnitz University of Technology, Germany during August 14-18, 2017.
14. Participated as an invited speaker in the 29th International Conference of the Jangjeon Mathematical Society on Number Theory and Special Functions and its Applications, August 8-10, 2016 organized by the Pondicherry University.
15. Presented a paper in Second International Conference on Mathematics and Statistics (AUS-ICMS'15)' organized by the American University of Sharjah during April 2-5, 2015.
16. Attended the Seventh Conference on Function Spaces at SIUE 2014, Edwardsville, USA held during May 20-24, 2014 and gave a talk.
17. Presented a paper in the World Congress on Engineering (WCE-2013), July 3-5, 2013 held at Imperial College London.
18. Presented a paper in the International Conference on Mathematical Sciences (ICMS-2012), December 28-31, 2012 organized by the Shivaji Science College, Nagpur (India).
19. Presented a paper in the International Congress in Honour of Professor H. M. Srivastava, August 23-26, 2012, organized by the Uludag University, Bursa, Turkey.
20. Presented a paper in the International Conference on Applied Mathematics and Approximation Theory May 17-20, 2012, organized by the TOBB University, Ankara, Turkey.
21. Presented a paper in International Conference on Mathematical Modelling and Scientific Computation, March 16-18, 2012 organized by Gandhigram Rural Institute, Tamil Nadu.
22. Participated in INSPIRE Science Camps organized by the HNB Garhwal University for Uttarakhand State and delivered lectures in 2020, 2014.

OTHER ACADEMIC AND ADMINISTRATIVE RESPONSIBILITIES:

1. Working as Chief Warden of Rajiv Bhawan Hostel since January, 2024
2. Working as Faculty-in-Charge placement at Department level.
3. Worked as warden of Azad Bhawan Hostel from July, 2021 to December, 2023
4. Worked as member of UG Curriculum Revision Committee since 2021-2023
5. Member of Department Research Committee (2022-2024, 2018-2020, 2014-2016)

6. Member of Department Academic Program Committee (2024-26, 2020-2022, 2016-2018, 2012-2014)
7. Faculty-in-Charge Administration at Department Level (2020-2022)
8. Convenor of the Committee for Designing the Structure of BS-MS Program (2021)
9. Member of the Panel of SRIC for Recruitment of Project/Research Staff (2019-2023)
10. Member of Library Advisory Committee (2019-2022)
11. Faculty Advisor for Int. M. Sc. Students (2019-2024, 2014-2018)
12. Member of Department Space Management Committee (2019)
13. Coordinator, Preparatory Course (2019-2020)
14. Member of Departmental Faculty Search Committee (2019)
15. Office-in-Charge Department Library (2018-2020)
16. Member of Department Administrative Committee (2018-2020, 2014-2015)
17. Member of Departmental Purchase Committee (2021-2023, 2018-2019)
18. Member of Department Anti-Ragging Committee (2014-2019)
19. Member of Institute Academic Program Committee (2016-2018)
20. Office-in-Charge Time Table at Department (2014-2018)
21. Participated in many confidential operations of JEE, GATE/JAM, recruitment of Technical Officers and non-teaching staff etc. time to time.

LIST OF PUBLICATIONS

(Web of Science Researcher ID AAY-1275-2020, MATHSCINET MR Author ID: 753824)

Research Papers in Journals:

1. Manju Sharma, **Uday Singh**, Some density results by deep Kantorovich type neural network operators, *J. Math. Anal. Appl.* 533(2), 2024, 128009.
2. Abhay Pratap Singh, **Uday Singh**, Approximation of functions in a generalized Hölder-Lebesgue space by means of the Gauss-Weierstrass singular integral, *J. Nonlinear and Convex Anal*, 25(9), 2024, 2295-2304.
3. Abhay Pratap Singh, **Uday Singh**, Approximation properties of a modified Gauss-Weierstrass singular integral in a weighted space, *J. Inequal. Appl.* 94(2024), <https://doi.org/10.1186/s13660-024-03171-9>.
4. Abhay Pratap Singh, **Uday Singh**, Approximation of functions in a weighted Lebesgue space by means of the Picard singular integral, *J. Math. Inequal.* 17(4) (2023), 1551-1563.
5. **Uday Singh**, Birendra Singh, On rate of convergence of matrix means of corrected Fourier series, *Appl. Math. Comput.*, 457 (C), 2023, 128216, doi.org/10.1016/j.amc.2023.
6. Manju Sharma, **Uday Singh**, Approximation by a neural network interpolation operator for irregular grid points, *J. Nonlinear and Convex Anal*, 24(9), 2023, 1919-1928.
7. Birendra Singh, **Uday Singh**, Fourier Series Approximation in Besov Spaces, *Journal of Mathematics*, vol. 2023, Article ID 4250869, 8 pages, 2023. <https://doi.org/10.1155/2023/4250869>.
8. **Uday Singh**, Soshal Saini, Uniform approximation on $L[0, \infty)$ -Space by Cesáro Means of Laguerre Series, *Proc. Nat. Acad. Sci. India Sect. A* **92**(2022), 179–185.
9. W. Łenski, **Uday Singh**, B. Szal, Trigonometric approximation of functions in seminormed spaces, *Math. Equal. Appl.* 24(1) (2021), 89–101.
10. **Uday Singh**, On the trigonometric approximation of functions in a weighted Lipschitz class, *J. Anal.* 29(2021), 325-335.
11. Singh, Birendra; **Singh, Uday**, Some characterizations of Hausdorff matrices and their application to Fourier approximation. *J. Comput. Appl. Math.* 367 (2020), 112450, 8 pp.

12. Saini, Soshal; **Singh, Uaday**, Approximation of f , conjugate function of f belonging to a subclass of L_p -space by product means of conjugate Fourier series. *J. Anal.* 28 (2020), no. 1, 155–16.
13. Rathore, Arti; **Singh, Uaday**, On the degree of approximation of functions in a weighted Lipschitz class by almost matrix summability method. *J. Anal.* 28 (2020), no. 1, 21–33.
14. Srivastava, Shailesh Kumar; **Singh, Uaday**, On T-strong convergence of numerical sequences and Fourier series. *Proc. Nat. Acad. Sci. India Sect. A* 88 (2018), no. 4, 571–576.
15. Rathore, Arti; **Singh, Uaday**, Approximation of certain bivariate functions by almost Euler means of double Fourier series. *J. Inequal. Appl.* 2018, Paper No. 89, 15 pp.
16. **Uaday Singh**, Arti Rathore, A note on the degree of approximation of functions belonging to certain Lipschitz class by almost Riesz means, *Stud. Univ. Babeş-Bolyai Math.* 63(2018), no. 3, 371-379.
17. **Uaday Singh**, Soshal Saini, Approximation of Periodic Functions in certain subclasses of L_p $[0, 2\pi]$, *Asian-European J. Math.* 10 (3) (2017), 12 pp.
18. Saini, Soshal; **Singh, Uaday**, Degree of approximation of functions belonging to $\text{Lip}(\omega(t), p)$ -class by linear operators based on Fourier series. *Boll. Unione Mat. Ital.* 9 (2016), no. 4, 495–504.
19. Soshal, **Uaday Singh**, Approximation of periodic integrable functions in terms of modulus of continuity, *Acta et Commentationes Universitatis Tartuensis de Mathematica*, 20 (1), 2016, 23-34.
20. Shashi Sharma, **Uaday Singh**, V. K. Katiyar, Magnetic Field Effect on Floe Parameters of Blood along with Magnetic Particles in a Cylindrical Tube, *J. Magnetisms and Magnetic Materials*, 377(2015), 395 - 401.
21. Shashi Sharma, V. K. Katiyar, **Uaday Singh**, Mathematical Modelling for Trajectories of Magnetic Nanoparticles in a Blood Vessel under Magnetic Field, *J. Magnetisms and Magnetic Materials*, 379(2015), 102-107.
22. S. Sharma, **U. Singh**, V. K. Katiyar, Modeling and in vitro study on capture efficiency of magnetic nanoparticles transported in an implant-assisted cylindrical tube under magnetic field, *Microfluidics and Nanofluidics* 19(2015), 1061-1070.
23. S. Sharma, **U. Singh**, V. K. Katiyar, Modeling and in vitro study on capture efficiency of magnetic nanoparticles transported in an implant-assisted cylindrical tube under magnetic field, *Microfluidics and Nanofluidics* 19 (2015), 1061-1070.
24. S. Sharma, V. K. Katiyar, **U. Singh**, Mathematical modeling on capturing of magnetic nanoparticles in an implant assisted channel for magnetic drug targeting, *Int. J. Environmental, Chemical, Ecological, Geological and Geophysical Engineering*, 2015, 1082-1085.
25. **Singh, Uaday**; Srivastava, Shailesh Kumar, Trigonometric approximation of functions belonging to certain Lipschitz classes by $C_{1,T}$ operator. *Asian-Eur. J. Math.* 7(2014), no. 4, 1450064, 13 pp.
26. Srivastava, Shailesh Kumar; **Singh, Uaday**, Trigonometric approximation of periodic functions belonging to $\text{Lip}(\omega(t), p)$ -class. *J. Comput. Appl. Math.* 270 (2014), 223–230.
27. **Singh, Uaday**; Srivastava, Shailesh Kumar, Approximation of conjugate of functions belonging to weighted Lipschitz class $W(L_p, \xi(t))$ by Hausdorff means of conjugate Fourier series. *J. Comput. Appl. Math.* 259 (2014), part B, 633-640.
28. **Singh, Uaday**; Sonker, Smita, Trigonometric approximation of signals (functions) belonging to weighted $(L_p, \xi(t))$ -class by Hausdorff means. *J. Appl. Funct. Anal.* 8(1) (2013), 37- 44.
29. **Singh, Uaday**; Srivastava, Shailesh Kumar, Degree of approximation of functions in Lipschitz class with Muckenhoupt weights by matrix means. *IAENG Int. J. Appl. Math.* 43 (2013), no. 4, 190–194.

30. Sonker, Smita; **Singh, Uday**, Degree of approximation of the conjugate of signals (functions) belonging to $Lip(\alpha, r)$ -class by $(C, 1)(E, q)$ means of conjugate trigonometric Fourier series. *J. Inequal. Appl.* 2012, 2012:278, 7pp.
31. **Singh, Uday**; Mittal, M. L.; Sonker, Smita, Trigonometric approximation of signals (functions) belonging to $W(Lr, \xi(t))$ class by matrix $(C1.N_p)$ operator. *Int. J. Math. Math. Sci.* 2012(2012), 11 pp.
32. Mittal, M. L.; Rhoades, B. E.; Sonker, Smita; **Singh, U.**, Approximation of signals of class $Lip(\alpha, p)$ by linear operators. *Appl. Math. Comput.* 217 (2011), no. 9, 4483-4489.
33. Mittal, M. L.; **Singh, Uday**, T.C1 summability of a sequence of Fourier coefficients. *Appl. Math. Comput.* 204 (2008), no. 2, 702-706.
34. Mittal, Madan Lal; **Singh, Uday**; Mishra, Vishnu N., On the strong Nörlund summability of conjugate Fourier series. *Appl. Math. Comput.* 187 (2007), no. 1, 326-331.
35. Mittal, M. L.; Rhoades, B. E.; Mishra, V. N.; **Singh, Uday**, Using infinite matrices to approximate functions of class $Lip(\alpha, p)$ using trigonometric polynomials. *J. Math. Anal. Appl.* 326 (2007), no. 1, 667-676.

Research Papers in Conference Proceedings:

1. Manju Sharma; **Uday Singh**, Fractional Neural Network Interpolation Operator for Irregular Grid Points, New Tools in Mathematical Analysis and Applications, Research Perspectives, 2025, 47-59. Proceedings of the 14th ISAAC Congress 2023, Ribeirão Preto, Brazil, <https://doi.org/10.1007/978-3-031-77050-0-28>.
2. Saini, Soshal; **Singh, Uday**, Approximation of functions in a weighted L_p -norm by summability means of Fourier series, Recent Developments in Algebra and Analysis, Vol. 1(2024), 315–326. (Birkhäuser/Springer, Cham©2024)[Proceedings of International Conference on Recent Developments in Mathematics, Dubai, 2022].
3. Birendra Singh, **Uday Singh**, On Strong Approximation in Generalized Hölder and Zygmund Spaces. *Comput. Sci. Math. Forum* 2023, 7(9), <https://doi.org/10.3390/IOCMA2023-14433>.
4. Shailesh Kumar Srivastava, **Uday Singh**, Trigonometric approximation of periodic functions belonging to weighted Lipschitz class $W(Lp, \Psi(t), \beta)$, Contemporary Mathematics (CONM) Book Series Published by AMS [Proceedings of the 7th Conference on Function Spaces at SIUE 2014, Edwardsville, USA held during May 20-24, 2014], Vol. 645 (2015), pp. 283-291.
5. S. Sharma, A. Gaur, **U. Singh**, V. K. Katiyar, Capture efficiency of magnetic nanoparticles in a tube under magnetic field, Procedia Materials Science 10(2015), 64-69 [2nd International Conference on Nanomaterials and Technologies (CNT 2014)]
6. Soshal, **Uday Singh**, Degree of approximation of $f \in L[0, \infty)$ by means of Laguerre – Fourier series, Mathematical Analysis and Its Applications (Springer Proceedings in Mathematics & Statistics, Vol. 143) [Proceedings of ICRTMAA 2014 held at IIT Roorkee during December 21-23, 2014], pp. 207-217.
7. **Uday Singh**, Shailesh Kumar Srivastava, Fourier Approximation of Functions Conjugate to the Functions Belonging to Weighted Lipschitz Class, Lecture Notes in Engineering and Computer Science, 1(2013), 236-240. [Proceedings of WCE-2013 held at Imperial College of London, July 3-4, 2013].
8. Smita Sonker, **Uday Singh**, Approximation of Signals (Functions) Belonging to $Lip(a, p, w)$ - Using Trigonometric Polynomials, Procedia Engineering (Elsevier), 38(2012), 1575-1585.

[*Proceedings of ICMOC-2012 held at Noorul Islam Centre for Higher Education during April 11-12, 2012*].

9. **Uday Singh**, Smita Sonker, Degree of Approximation of Function $f \in H_p^{(w)}$ Class in Generalised Hölder Metric by Matrix Means, Communications in Computer and Information Sciences (Springer-Verlag), 283 (2012), 1-10. [*Proceedings of ICMMSC-2012 held at Gandhigram Tamilnadu during March 16-18, 2012*].

Books/Chapters/Monographs:

1. PN Agrawal, RN Mohapatra, **U Singh**, HM Srivastava, Mathematical Analysis and its Applications: Roorkee, India, 143(2014) (Edited the Proceedings Published by Springer).
2. **Uday Singh**, Shailesh Kr. Srivastava, On the Degree of Approximation of Conjugate Functions in Weighted Lipschitz Class, Book chapter), *IAENG Transactions on Engineering Sciences* by CRC Press/Balkema, Taylor & Francis Group, pp. 81-89(2014).
3. **Uday Singh**, Fourier Approximation in L_p -Spaces (A monograph), VDM Verlag Dr. Müller Aktiengesellschaft & Co. KG, Germany, ISBN-NR 978-3-639-20410-0 (2009).
4. Reviewed the book "Theory and Problems of Complex Variables, SI (metric edition) by Spiegel" for its 2009 Edition.
5. A Chapter entitled STRAIGHT LINES in Mathematics Textbook for Class XI, published by NCERT, New Delhi (2006).
6. A Chapter entitled COORDINATE GEOMETRY in Mathematics Textbook for Class IX, published by NCERT, New Delhi (2006).