UNIVERSITY OF CALCUTTA

FACULTY ACADEMIC PROFILE/ CV

1. **Full name of the faculty member**: Dr. Uttam Ghosh
2. **Designation**: Assistant Professor
3. **Specialization** : Fractional Calculus, Non-linear Dynamics: Ecological and Epidemic Modelling
4. **Passport size photograph** :

5. **Contact information** :

Address Vill-FuliaPareshnathPur, Po-Fulia Colony, Dist-Nadia, Pin-741402

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6. **Academic qualifications**:

College/ university from which the degree was obtained	Abbreviation of the degree
Shantipur College University of Calcutta	B.Sc (Mathematics Honours)
University of Calcutta	M.Sc (First Class First)
Kalyani University	Ph.D

7. **Positions held/ holding:**

i. Served as anAssistant Professor in Mathematics, Nabadwip Vidyasagar College, from10.09.2008–08.12.2015.

ii. Assistant Professor in the Department of Applied Mathematics, Calcutta University fr**om 09.12.2015 - till date.**

8. **Research interests**:

i) During PhD I worked in the field of Fractal Geometry, Information Theory Percolation Theory and their applications.

ii) Presently working on Fractional Calculus

iii) Also involved with the stability analysis of Epidemic and Ecological modeling models in Mathematical Biology.

9. **Research guidance**:

Number of researchers awarded M.Phil/ Ph.D degrees : ……0……

Number of researchers pursuing M.Phil/ Ph.D : ……7……

10. **Projects :**

Completed projects :Nil

Co-Investigator of the Research Project " Characterization of Unreachable (Holderian) Functions via Local Fractional Derivative and Deviation Functions" funded by Board of Research in nuclear Science (BRNS), Govt. of India for the period 2014-2016.

Currentprojects :

……..

PI-SERB-TARE_ no-**TAR/2018/000851**, Title-Bifurcation analysis of fractional differential equation model of ecosystem- Study of memory dependence,Govt. of India for the period 2018-2021.

11. **Select list of publications**:

a) ***Journals:***

51. J K Ghosh et al. Qualitative analysis and optimal control of a two-strain Dengue model with its co-infections", International Journal of Applied and Computational Mathematics (Accepted for publication). 2020. **Scopus**

50. SK Biswas, J K Ghosh, S Sarkar and U Ghosh, COVID-19 pandemic in India: a mathematical model study, Nonlinear Dyn. (Accepted for publication) https://doi.org/10.1007/s11071-020-05958-z: **Impact Factor- 4.867**.

49. R.Pakhira,U.Ghosh,S.Sarkar.V.N.Mishra, Study of memory effect in an EOQ model with fractional polynomial demand rate under fuzzy environment, Discontinuity, Nonlinearity, and Complexity, (Accepted fro publication). 2020. **Scopus**

48. U. Ghosh et al. Bifurcation analysis of a two dimensional predator-prey model with Holling type IV functional response and non-linear predator harvesting. Journal of Biological Systems, (Accepted for Publication). https://doi.org/10.1142/S0218339020500199: **Impact Factor-0.733**.

47. T Das, U Ghosh, S Sarkar, S Das .Analytical study of D-dimensional fractional Klein–Gordon equation with a fractional vector plus a scalar potential - Pramana Journal of Physics, 2020,94 (1), 33.**Impact Factor-1.688.**

46. SK Biswas, U Ghosh, S Sarkar, Mathematical model of zika virus dynamics with vector control and sensitivity analysis, Infectious Disease Modelling 5, 23-41. 2020. **Impact Factor-2.522**

45.Pakhira, R., Sarkar, S, Ghosh, U., Study of memory effect between two memory dependent inventory models, Journal of Fractional Calculus and Applications, 2020,**11(1),** 138-155.

44. Pakhira, R., Sarkar, S, Ghosh, U., Study of memory effect in an inventory model for deteriorating items with partial backlogging, *Computers & Industrial Engineering*, **148** (2020) 106705. **Impact Factor-4.2.**

43.S . Biswas, U. Ghosh, Approximate Solution of Homogeneous and Nonhomogeneous 5αth-Order Space-Time Fractional KdV Equations, International Journal of Computational Methods,18(1), (2021) 2050018. **Impact Factor- 1.716.**

42.S Sengupta, U Ghosh, S Sarkar, S Das. Prediction of Ventricular Hypertrophy of Heart Using Fractional Calculus. Journal of Applied Nonlinear Dynamics 9 (2), 287-305. **Scopus**

41. Zahura Khatun, Md.Shahidul Islam,Uttam Ghosh, Mathematical modeling of hepatitis B virus infection incorporating,immune responses, *Sensors International*,2020,1, 1-8. **Elsevier Publication.**

40. S Debnath, U Ghosh, S Sarkar. Global dynamics of a tritrophic food chain model subject to the Allee effects in the prey population with sexually reproductive generalized- type top predator. Computational and Mathematical Methods 2 (2), 2020. **Scopus**

39. P. Chakroborty, **U. Ghosh**. S. Sarkar, Stability and bifurcation analysis of a discrete prey-predator model with square root functional response and optimal harvesting. Journal of Biological Systems, Vol. 28, No. 1 (2020) 91–110.**Impact Factor-0.733**.

38.P. Chakroborty, **U. Ghosh**. S. Sarkar, Stability and bifurcation analysis of a discrete prey–predator model with sigmoid functional response and Allee effect, Rendiconti del CircoloMatematico di Palermo Series 2,2020,64,**Impact Factor-1.1.**

37.S . Biswas, **U. Ghosh** , S. Sarkar and S. Das, Approximate Solution of Space-Time Fractional KdV Equation and Coupled KdV Equations, Journal of the Physical Society of Japan, 89(1), 2020., **Impact Factor-1.579.**

36. Pakhira.R.,Ghosh.U.,Sarkar.S.,(2019). Study of Memory Effect in a Fuzzy EOQ Model with No Shortage, I.J. Intelligent Systems and Applications, 2019, 11, 58-68.**Scopus.**

35. T. Das, **U. Ghosh**, S. Sarkar and S. Das. Higher-dimensional fractional time-independent Schrödinger equation via fractional derivative with generalized pseudoharmonic potential, Pramana – J. Phys. (2019) 93:76. **Impact Factor-1.688.**

34. R.Pakhira,U.Ghosh,S.Sarkar .Study of Memory Effect in an Inventory Model with Price Dependent Demand, Journal of Applied Economic Sciences. XIV, Summer, 2(64): 360–367. 2019. **Impact Factor-0.6**.

33.J. K. Ghosh, U. Ghosh, M. H. A. Biswas, S. Sarkar, Qualitative Analysis and Optimal Control Strategy of an SIR Model with Saturated Incidence and Treatment. Differential Equations and Dynamical Systems. 2019..**Impact Factor-0.833**.

32. R.Pakhira,U.Ghosh,S.Sarkar.V.N.Mishra, Study of memory effect in an Economic order quantity model for completely during backlogged demand during shortage. Progr.Fract. Differ. Appl. (Accepted).(will be published in 2020).

31.R.Pakhira,U.Ghosh,S.Sarkar.,Study of memory effect in an economic order quantity model with quadratic type demand rate, CMST 25(2) 71–80 (2019).

30.R.Pakhira,U.Ghosh,S.Sarkar,Study of memory effect in a fuzzy EOQ model with no shortage,I.J.Intelligent Systems and Applications, **11, 58-68.** (2019).

29.J. Banerjee, **U. Ghosh** , S. Sarkar and S. Das. A Study of Fractional Schrödinger Equation-composed via Jumarie fractional derivative.*Pramana Journal of Physics*, 88, 2017. **ISSN No-0304-4289.Impact Factor-1.688.**

28. S. Bhakta, **U. Ghosh** and S. Sarkar, Effect of secondary electron emission on nonlinear dust acoustic wave propagation in a complex plasma with negative equilibrium dust charge,*Physics of Plasmas* 24(2):023704 **,**2017**. ISSN No-1070-664X.Impact Factor-1.688.**

27. U. Ghosh ,J. Banerjee, S. Sarkar and S. Das. Fractional Klein–Gordon equation composed of Jumarie fractional derivative and its interpretation by a smoothness parameter. 2018, Pramana. 90(6).**Impact Factor-1.688.**

26. T. Das, **U. Ghosh**, S. Sarkar and S. Das. Time independent fractional Schr□odinger equation for generalized Mie-type potential in higher dimension framed with Jumarie type fractional derivative. Journal of Mathematical Physics 022111 (2018)(59).**Impact Factor-1.355.**

25. U. Ghosh, S. Raut, S. Sarkar, S. Das, Solution of space time fractional generalized KdV equation, KdV burger equation and Bona-Mahoney-Burgers equation with dual power-law nonlinearity using complex fractional transformation, Journal of Mathematical and Computational Science, Vol 8, No 1 (2018), 114-129.). **Scopus.**

24. R. Pakhira, **U. Ghosh**, S. Sarkar. Study of Memory Effect in an Inventory Model with Linear Demand and Salvage Value, IJAER. 2018. 13,(20) pp. 14741 - 14751.

23. P. Paul, J. Bannerjee and **U. Ghosh.** Relationship between Inland Fishing and Rain fall pattern of West Bengal a statistical analysis: *European Academic Research*: 3(4), 2015. **ISSN No- 2286-4822**.

22. S. Biswas and **U. Ghosh**, Stability and Bifurcation Analysis of Logistically Grown SIR Model with External Infection Effect of the Susceptible Class and Effect of Loss of Immunity of the Recovered Class, *Journal of International academy of Physical Science*, 19(3), 2015. **ISSN No- 0974-9373**.

21. RaicharanDenra, SamitPaul,Uttam Ghosh and Susmita Sarkar. Nonlinear dust-acoustic wave propagation in a Lorentzian dusty plasma in presence of negative ions. J. Plasma Phys. (2018), vol. 84, 905840507.**Impact Factor-1.31.**

20. J. Ghosh, **U. Ghosh**, S. Sarkar. Qualitative Analysis of Both Hyperbolic and Non-hyperbolic Equilibria of a SIRS Model with Logistic Growth Rate of Susceptibles and Inhibitory Effect in the Infection. Computational Methods in Science and Technology. 2018. 24(4). 285–300 (2018).

19. **U. Ghosh**, S. Sarkar. Global Stability Analysis of Logistically Grown SIR Model with Loss of Immunity, inhibitory effect, crowding effect and it's protection measure. Computational Methods in Science and Technology. 2018. 24(2). 125-141. **ISSN No-1505-0602.**

18.U. Ghosh, S. Sarkar, S. Das. Analytical Solutions of Classical and Fractional KP-Burger Equation and Coupled KdV Equation. 2016. Computational Methods in Science and Technology. 2016. 22(3). 143-152. **ISSN No-1505-0602.**

17. **U. Ghosh**, S. Sengupta, S. Sarkar, S. Das. Analytical solution with tanh-method and fractional sub-equation method for non-linear partial differential equations and corresponding fractional differential equation composed with Jumarie fractional derivative. Int. J. Appl. Math. Stat.; 2016. 54 (3). 11-31. **ISSN No- 0973-1377.**

16. U. Ghosh, S. Sarkar and D. K. Khan.Modelling of Infectious Disease in Presence of Vaccination and Delay, International Journal of Epidemiology & Infection. 2(3). 50-57. 2014. **ISSN No-2331-8244.**

15. U. Ghosh and D. K Khan**.** Spatial pattern analysis of two landscape in North-western parts of Orissa, India. *American Journal of Mathematical Analysis* 1-3. 2014. **ISSN No-2333-8490**.

14. U. Ghosh, S. Sengupta, S. Sarkar and S. Das. Analytic solution of linear fractional differential equation with Jumarie derivative in term of Mittag-Leffler function. American Journal of Mathematical Analysis. 2015; 3(2). 32-38. **ISSN No-2333-8490**.

13. **U Ghosh**, S Sarkar, S Das. Fractional Weierstrass Function by Application of Jumarie Fractional Trigonometric Functions and its Analysis, *Advances in Pure Mathematics*, 2015(5),717-732. **ISSN No-2160-0368**.

12. U Ghosh, S Sarkar , S Das. Solution of System of Linear Fractional Differential Equations with Modified Derivative of JumarieType, *American Journal of Mathematical Analysis*, 2015, (3), No.3, 72-84. **ISSN No-2333-8490**.

11. U Ghosh, S. Sengupta, S Sarkar , S Das. Characterization of Non-Differentiable Points of a Function by Fractional Derivative of Jumarie Type. *European Journal of Academic Essays* . 2(2): 70-86, 2015.**ISSN No-2183-1904.**

20. S. Sengupta, U Ghosh, S Sarkar , S Das A Mathematical Approach to Characterize Left Ventricular Hypertrophy from ECG Diagrams. Open Journal of cardic heart disease. 2018. 1-5. **ISSN No-25780204**
21. **U. Ghosh**, Md R. Ali, S. Raut, S. Sarkar, S. Das, D'Alembert's solution of fractional wave equations using the complex fractional transformation, Nonlinear Sci. Lett. A, 9(4)(2018), pp.299-311.

10. U. Ghosh and D. K Khan**.** Study of land use change through stochastic processes- a case study in plateau region of Mayurbhanj district, Orissa. *JERS*. 136-138. 2011. **ISSN No- 0976-7916**

9. U. Ghosh and D. K Khan**.** Stability analysis of land use change. *IJAER*S. 59-60. 2011. **ISSN No-2349-6495.**

8. **U. Ghosh**, Md. Ramjan Ali, S. Sarkar, S. Das. Formulation and solution of three dimensional space-time fractional KdV-Zakahrov-Kuznetsov and modified KdV-Zakahrov-Kuznetsov. 2018. International Journal of Applied Mathematics and Statistics. 2018. 57(5). 22-39.

7.R. Pakhira, **U. Ghosh**, S. Sarkar.Study of Memory Effects in an Inventory Model Using Fractional Calculus,Applied Mathematical Sciences. 2018.Vol. 12, no. 17, 797 - 824.**ISSN-1314-7552**

6. R. Pakhira, U. Ghosh, S. Sarkar. Study of Memory Effect in an Inventory Model with Quadratic Type Demand Rate and Salvage Value. Applied Mathematical Sciences. Vol. 13, 2019, no. 5, 209 - 223. **ISSN-1314-7552**

5. **U Ghosh**, S Sarkar , S Das. Solutions of Linear Fractional non-Homogeneous Differential Equations with Jumarie Fractional Derivative and Evaluation of Particular Integrals, *American Journal of Mathematical Analysis*, 2015, (3), No.3, 54-64. **ISSN No-2333-8490**.

4. Pakhira.R.,Ghosh.U.,Sarkar.S.,(2018). Application of Memory effects In an Inventory Model with Linear Demand and No shortage, *International Journal of Research in Advent Technology, Vol.6, No.8, August 2018.* **ISSN-1314-7552**
3. Pakhira.R.,Ghosh.U.,Sarkar.S.,(2019).Study of Memory Effect In an Inventory Model with Linear Demand and Shortage,International Journal of Mathematical Sciences and Computing(IJMSC),*ISSN:* 2310-9025 (Print), *ISSN*: 2310-9033 (Online).(Accepted).

2. Pakhira.R.,Ghosh.U.,Sarkar.S.,(2019).Application of memory effect in an inventory model with price dependent demand rate during shortage, I.J. Education and Management Engineering, 9(3), 2019,DOI: 10.5815. ***ISSN:* 2305-3623** (Accepted)

1. S. Sengupta, U Ghosh, S Sarkar , S Das. Prediction of Ventricular Hypertrophy of Heart using Fractional Calculus. Journal of Applied Nonlinear Dynamics. **ISSN No-**2164-6457 (**Accepted for publication**)

(b) Books/ book chapters :

1. Uttam Ghosh, Dilip Kumar Khan: *information, fractal, percolation and Geo-environmental Complexities*. 01/2014; Lap Lambert Academic Publicers., ISBN: 978-3-659-56351-5.

c) ***Conference/ seminar volumes***:

1.U. Ghosh, S. Chaudhury and D. K. Khan. Mathematical Modelling of Epidemiology in presence of Vaccination and Delay. Computer Science & Information Technology (Proceedings). 91-98. 2013. **ISSN No- 2231 – 5403**

2. **U. Ghosh and S. Sarkar,** Bifurcation Analysis of Logistically Grown SIR Model with Effect of Loss of Immunity and delay. Elsevier (Proceeding: Applied Non-Linear Dynamics and Chaos). 77-85. 2014. **ISBN No-978-93-5107-250-8.**

3. U. Ghosh and R. Ghosh**,** SIR epidemic modelling in presence of inhibitory effect and delay. Proceeding: International seminar Recent trends in Mathematics, Calcutta University, Spriger India. 2015. 227-235. **ISBN No- 978-81-322-2547_1.**

4. J. K. Ghosh and **U. Ghosh**. Stability and Bifurcation Analysis of a SIRS Model with Logistic Growth Rate of Susceptibles and Effect of Inhibitory Factor in the Infection. MSAST 2016. 201-213, **ISBN No-978-81-925832-3-5.**

5. R. Ghosh and **U. Ghosh,** Bifurcation analysis of SIR Model with Logistically Grown Susceptibles and Effect of Loss of Immunity of the Recovered Class". Proceeding: International seminar Recent trends in Mathematics, Calcutta University, Spriger India. 2015. 219-226. **ISBN No- 978-81-322-2547_1.**

6. U. Ghosh. Solution of system of non-linear Ordinary Caputo type Fractional Differential Equation by Homotopy Perturbation Method and Adomian Decomposition Method.Proceedings ICMCTI-2017, 275-83**. ISBN No-978-93-6862566-0-7.**

7. U. Ghosh ,Md. Ramujan Ali, S. Sarkar and S. DasHomotopy Perturbation Method for non-linear fractional differential equation with non-local Caputo fractional derivative. 11th International Conference MSAST-2017, Dec 21-23, 2017.

8. S. Sengupta, **U. Ghosh** , S. Sarkar and S. Das, Application of fractional calculus to distinguish left ventricular hypertrophy with normal ECG. Procedings of the 4th IEEE international conference –RIAT-2018.

9. A novel Technique to study hydrodynamics of Arterial system in Human Body: Fractional order analysis of windkessel Model. Proceeding 4th international conference Micro 2017. 124-126. **ISBN No-978-93-80813-45-5.**

10. P. Chakroborty, **U. Ghosh**. S. Sarkar, Stability and Bifurcation analysis of a Ratio Dependent Discrete Prey-Predator model with linear harvesting. Procedings of the 4th IEEE international conference –RIAT-2018, 151-156.

11. Pakhira.R.,Ghosh.U.,Sarkar.S.,(2018).'Application of Memory effects on an inventory model with constant demand rate and deteriorating items, IEEE, International Conference on New Trends in Engineering and Technology,2018(Accepted).

12. S. Sengupta, U Ghosh, S Sarkar , S Das. Investigation of Left Ventricular Hypertrophy using Mean Deviation Function. NCFMP 2018,Journal of Physics Through Computation (2019) Vol. 2: 41-46
Clausius Scientific Press, Canada.

13. U. Ghosh, and D. K. Khan.Characterization of Geometrical Complexity of the Landscape Patches Using Fractional Dimension. S. Chakraverty and P. Biswas (eds.), Proceeding. Recent Trends in Wave Mechanics. 2019.

14. **Invited lectures delivered :**

9. Delivered lecture in one day International Webinar organized by Department of Mathematics Nabadwip Vidyasagar College, West Bengal, India-743412, Title: Dynamics of SEAIQR Model with Saturated Type Treatment: A Case Study of Spain COVID-19, Date: 30/06/2020.

8. Delivered lecture in two day International Webinar organized by Department of Mathematics ACHARYA JAGADISH CHANDRA BOSE COLLEGE 1/1B, A. J. C. BOSE ROAD; KOLKATA - 700020, INDIA, Title: System of Linear and Non-linear Differential Equation: An Application to COVID-19 Dynamics, Date: 10/08/2020.

7. Delivered lecture in one day International Webinar organized by Department of Mathematics Basirhat College North 24 Parganas, West Bengal, India-743412, Title: Dynamics of SEAIQR Model with Saturated Type Treatment: A Case Study of Spain COVID-19, Date: 20/06/2020.

6.DST Sponsored Workshop at Hooghly Women's CollegeMathematics: The Queen of Science" to celebrate National Mathematics Day, 19.3.2019.

5. JBNSTS NCSTC-DST Teacher Tanning Workshop organized by JBNSTS at JB Centre of Excellence 2019.

4. Orientation Workshop for Girls of high school, organized by JBNSTS at JB Centre of Excellence.

3. JBNSTS NCSTC-DST Teacher Tanning Workshop organized by JBNSTS at Muragachha Govt. College

2. Recent Advances in Mathematics and Mathematical Sciences organized by Muragachha College, 2017

1. National Seminar on "Applications of Generalized Calculus in Physics and Applied Mathematics" held in Jadavpur University during 26-27th April, 2016.

12 **Awards:**

(i) JRF Awarded by CSIR in Dec. 2000.

(ii) Parimalkanti Ghosh Memorial Award (Gold Medal) for Standing First with First Class at M.Sc. Examination 2001 in Applied Mathematics.

Date: 23/09/2020

(Dr. Uttam Ghosh)
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