# MUHAMMAD SINAN

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## Summary of Qualifications

Mathematician specializing in applied mathematics and mathematical biology, with expertise in modeling infectious disease dynamics. Published researcher and award-winning academic skilled in computational simulations, data analysis, and visualization. Proficient in Python, MATLAB, and advanced mathematical tools, with experience in teaching and curriculum development.

## PROFESSIONAL EXPERIENCE

*Visiting Subject Specialist (SS) in Mathematics*
GOVERNMENT HIGHER SECONDARY SCHOOL MINGORA SWAT

Dec 2020 – Dec 2022
19200 Swat, Pakistan

Responsibilities:
- Taught college-level mathematics courses to 11th and 12th-grade students, covering advanced topics in algebra, calculus, and trigonometry.
- Developed and delivered structured lesson plans to prepare students for national board examinations.
- Engaged students through interactive problem-solving sessions, fostering analytical thinking and a deep understanding of mathematical concepts.
- Assessed student progress through regular quizzes, assignments, and exams, providing feedback to help improve their performance.Collaborated with faculty on curriculum development to align teaching with updated educational standards and enhance the overall learning experience

## AFFILIATION AND AWARDS

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|---|---:|
| IEEE Membership, IEEE Young Professionals, Member | 2020 – 2024 |
| Pakistan Mathematical Society (PakMS), Member | 2020 – present |
| Chinese University Fully Funded Scholarship, recipient | 2021 – 2024 |
| Second rank in Outstanding Graduate Student, recipient | 2023 |
| First prize in Academic Achievement Award, recipient | 2023 |

## SKILLS

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| Computer Skills: | SPSS Statistics, MATLAB, and Python programming language, LaTeX, HTML/ CSS, Adobe Photoshop, Blender |
| Language: | Urdu (Native), English (fluent), Pashto (Mother language) |

## EDUCATION

*Master of Science in Mathematics*, School of Mathematical Sciences
University of Electronic Science and Technology of China, Chengdu, China

Sept 2021 – June 2024

*BS Mathematics*, Department of Mathematics and Statistics,
University of Swat, Swat, Pakistan

Sept 2016 – Nov 2020

## PUBLICATIONS

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| Research Articles: | List of Articles is attached in the **Appendix. A** |
| Books (Published Thesis): | List of Thesis is attached in the **Appendix. B** |
| Poster Presentation: | List of Poster Presentation is attached in the **Appendix. C** |

## SEMINARS

- "*Mathematical Modelling and optimal control strategies of Covid–19 using dynamical system*"
- "*Cutaneous Leishmaniasis Disease with the Effect of Hospitalization*"
- "*Mathematical Modeling and Analysis of MonkeyPox Disease with Optimal Control Strategies*"
- "*Enhancing Radar Echo Extrapolation by ConvLSTM2D for Precipitation Nowcasting*"

## REFERENCES

References are available upon request

## Appendix. A

[1]. Khan, A., **Sinan, M**., Bibi, S., Shah, K., Hleili, M., Abdalla, B., & Abdeljawad, T. (2024). Dust acoustic nonlinearity of nonlinear mode in plasma to compute temporal and spatial results. *Alexandria Engineering Journal*, *104*, 115-123. **2024**

[2]. Naz, F., She, L., **Sinan, M**., & Shao, J. (2024). Enhancing Radar Echo Extrapolation by ConvLSTM2D for Precipitation Nowcasting. *Sensors*, *24*(2), 459.

[3]. **Sinan, M**., & Alharthi, N. H. (2023). Mathematical analysis of fractal-fractional mathematical model of COVID-19. *Fractal and Fractional*, *7*(5), 358. **2023**

[4]. **Sinan, M**., Leng, J., Shah, K., & Abdeljawad, T. (2023). Advances in numerical simulation with a clustering method based on K–means algorithm and Adams Bashforth scheme for fractional order laser chaotic system. *Alexandria Engineering Journal*, *75*, 165-179.

[5]. **Sinan, M**., Shah, K., Abdeljawad, T., & Akgul, A. (2023). Analysis of nonlinear mathematical model of COVID-19 via fractional-order piecewise derivative. *Chaos Theory and Applications*, *5*(1), 27-33.

[6]. Khan, A., Khan, A., & **Sinan, M**. (2022). Ion temperature gradient modes driven soliton and shock by reduction perturbation method for electron-ion magneto-plasma. *Mathematical Modelling and Numerical Simulation with Applications*, *2*(1), 1-12. **2022**

[7]. Rezapour, S., Etemad, S., **Sinan, M**., Alzabut, J., & Vinodkumar, A. (2022). A Mathematical Analysis on the New Fractal-Fractional Model of Second-Hand Smokers via the Power Law Type Kernel: Numerical Solutions, Equilibrium Points, and Sensitivity Analysis. *Journal of Function Spaces*, *2022*(1), 3553021.

[8]. Shah, K., **Sinan, M**., Abdeljawad, T., El-Shorbagy, M. A., Abdalla, B., & Abualrub, M. S. (2022). A Detailed Study of a Fractal-Fractional Transmission Dynamical Model of Viral Infectious Disease with Vaccination. *Complexity*, *2022*(1), 7236824.

[9]. **Sinan, M**., Leng, J., Anjum, M., & Fiaz, M. (2022). Asymptotic behavior and semi-analytic solution of a novel compartmental biological model. *Mathematical Modelling and Numerical Simulation with Applications*, *2*(2), 88-107.

[10]. **Sinan, M**., Ahmad, H., Ahmad, Z., Baili, J., Murtaza, S., Aiyashi, M. A., & Botmart, T. (2022). Fractional mathematical modeling of malaria disease with treatment & insecticides. *Results in Physics*, *34*, 105220.

[11]. **Sinan, M**., Shah, K., Kumam, P., Mahariq, I., Ansari, K. J., Ahmad, Z., & Shah, Z. (2022). Fractional order mathematical modeling of typhoid fever disease. *Results in Physics*, *32*, 105044.

[12]. Ali, A., Khan, M. Y., **Sinan, M**., Allehiany, F. M., Mahmoud, E. E., Abdel-Aty, A. H., & Ali, G. (2021). Theoretical and numerical analysis of novel COVID-19 via fractional order mathematical model. *Results in physics*, *20*, 103676. **2021**

[13]. **Sinan, M**., Shah, K., Khan, Z. A., Al-Mdallal, Q., & Rihan, F. (2021). On Semianalytical Study of Fractional-Order Kawahara Partial Differential Equation with the Homotopy Perturbation Method. *Journal of Mathematics*, *2021*(1), 6045722.

[14]. **Sinan, M**., Ali, A., Shah, K., Assiri, T. A., & Nofal, T. A. (2021). Stability analysis and optimal control of COVID-19 pandemic SEIQR fractional mathematical model with harmonic mean type incidence rate and treatment. *Results in Physics*, *22*, 103873.

[15]. **Sinan, M**., & Khan, A. (2020). Analytic approximate solution of rabies transmission dynamics using homotopy perturbation method. *Matrix Science Mathematics (MSMK)*, *4*(1), 01-05. **2020**

## Appendix. B

[1]. Sinan, M. (2022). *Mathematical modelling of infectious disease: Mathematical biology (Stability analysis of dynamical leptospirosis disease with harmonic mean incidence rate)* (1st ed.). LAP LAMBERT Academic Publishing. ISBN 978-620-4-74621-0 **2022**

## Appendix. C

[1]. Sinan, M. (2022, September). Fractional mathematical modelling of malaria disease with treatment & insecticides. *Paper presented at the Mathematical Modelling of Infectious Diseases conference (Virtual),* Chengdu, China. https://doi.org/10.54985/peeref.2210p3573404 **2022**