Gopikrishnan Chirappurathu Remesan

Résumé

Curriculum Vitae

Given names : **Gopikrishnan** Last name : **Chirappurathu Remesan**
Citizenship : Indian Date of birth : 26th May, 1992
Languages : Malayalam (first language), English (fluent)
Marital status : Married
Office address : Cabin 10, Dr A P J Abdul Kalam Block (D03-First floor), Sahyadri Campus, Indian Institute of Technology Palakkad, Kerala, India

E-mail (O) : gopikrishnan@iitpkd.ac.in E-mail (P): gopi123krishnan@gmail.com
Webpage : https://math.iitpkd.ac.in/gopikrishnan/
Phone (Office) : *0491 209 1405*

ORCiD: 0000-0002-4507-4463 Scopus ID: 57219814720 MR Author ID: 1405273

Current employment

1st March, 2023 (Ongoing) **Assistant Professor in Mathematics**, *Dept.of Mathematics, Indian Institute of Technology Palakkad*, Kerala, India

Education

Integrated BS – MS Dual Degree

2010 - 2012 **Bachelor of Science (Biology, Chemistry, Physics, and Mathematics)**, *Indian Institute of Science Education and Research*, Thiruvananthapuram, India, Cumulative grade point average - 8.65/10 up to 4^{th} semester

2012 - 2015 **Master of Science (Mathematics)**, *Indian Institute of Science Education and Research*, Thiruvananthapuram, India, Cumulative grade point average - 8.58/10

Doctor of Philosophy

2016 July - 2021 June **Doctor of Philosophy (Mathematics)**, *IITB – Monash Research Academy*, Joint doctoral programme by Indian Institute of Technology Bombay, India and Monash University, Australia on the topic **"Modelling and numerical analysis of complex tumour growth problems"**,
Thesis defended on : June 18, 2021
PhD awarded on : August 7, 2021

See a Three – Minute Talk on my Ph.D. thesis.
See a One – Minute Animation on my Ph.D. thesis.

Thesis advisors IIT Bombay: Prof Neela Nataraj
Monash University: Prof Jerome Droniou, A/Prof Jennifer Flegg

Honours and awards

2021 July **Prof Prabhulal Bhatnagar Memorial Prize** (2020-2021) for being the most outstanding of all the students who completed the requirements for the degree of Doctor of Philosophy in Mathematics.

2020 August **First prize**, Three Minute Thesis Talk, IITB - Monash Research Academy.

2015 June **Institute Silver Medal**, For best academic performance and highest cumulative grade point average, School of Mathematics, IISER Thiruvananthapuram, Kerala, India.

2010 - 2015 **INSPIRE** (Innovation in Science Pursuit for Inspirational Research) Fellowship (Department of Science and Technology, Government of India), Registration Number - DST/INSPIRE-SHE/IISER-T/2008

National level examinations

Council of Scientific and Industrial Research - Junior Research Fellowship, June 2015 (All India Rank 89/768), December 2015 (All India Rank 43/934), June 2016 (All India Rank 123/1805).

Graduate Aptitude Test in Engineering – Mathematics, January 2016 (AIR 104/6305).

Experience

June 2015 - July 2016 **Visiting Lecturer**, *Bishop Chulapparambil Memorial College Kottayam*, Kerala, India

2016–2021 Teaching assistantships at IIT Bombay

- Calculus (IIT Bombay, B.Tech. first year, 2018)
- Numerical analysis (IIT Bombay, (B.Tech - II Year 2018), (M.Sc. - I Year 2019 & 2020))
- Programming Lab (Fortran) (IIT Bombay, M.Sc. first year, 2021)

April 2021 - June 2021 **Research associate**, *Dept. of Mathematics, Indian Institute of Technology Bombay*, Maharashtra, India

July-Dec 2021 **Postdoctoral fellow**, *Dept. of Mathematics, Indian Institute of Technology Bombay*, Maharashtra, India

Topic: Numerical analysis of finite element methods for phase field crystal equations, a priori and a posteriori error estimates for finite element methods for fourth order semilinear partial differential equations. Mentor: Prof Neela Nataraj.

1st Jan 2022 - 31st Jan 2023 **Post doctoral fellow**, *Dept. of Mathematics "F. Enriques", Via C. Saldini* 50*, Universita Degli Studi di Milano*, Italy

Topic: Development, analysis, and numerical testing of a posteriori estimates, near best approximation in a given, possibly nonconforming discrete solution space, best error localizations in the adaptive solution of a nonlinear partial differential equation with arbitrary variational data. Mentor: Prof Andreas Veeser.

Research interest

Main research interest are mathematical modelling of different physical problems (with focus on problems from life sciences), design and implementation of numerical schemes, and theoretical and numerical analysis. This entails:

- Derivation of mathematical models using multiphase fluid flow and mixture theory, linear and nonlinear elasticity.
- Design of numerical schemes using appropriate combinations of finite volume, finite element, and finite difference methods.
- Rigorous theoretical and numerical analysis of physical models with hyperbolic, elliptic, and parabolic partial differential equations.

Another research interest is numerical analysis of nonlinear elliptic partial differential equations.

Teaching

Current Teaching

Semester	Course	Category	Link
2026 Jan-May	Numerical Analysis with Programming (MA5015)	PG, Core	Course Page
	Project Level 2 (MA 5120)	PG, Elective	Course Page

Past courses

- Linear algebra and series (MA 1011A, B.Tech, Core) (Aug-Nov 2023, Aug-Nov 2024)
- Numerical analysis (MA 20232, B.Tech, Elective) (Jan-May 2024)

- Mathematical theory of finite elements (MA 6608, PG Elective) (Aug-Nov, 2023)
- Advanced partial differential equations (MA 7002, PhD Elective) (Jan-May, 2024)
- Ordinary differential equations (MA 5009, PG, Core) (Aug-Nov 2024)
- Numerical analysis with programming (MA 5015, PG, Core) (Jan-May 2025)
- Partial differential equations (MA 5015, PG, Core) (Aug-Nov 2025)
- Project Level 1 (MA 5110, PG, Elective) (Aug-Nov 2024, Aug-Nov 2025)
- Project Level 2 (MA 5120, PG, Elective) (Jan-May 2025)

Publications

Published articles

[1] G. C. Remesan. "Strong bounded variation estimates for the multi-dimensional finite volume approximation of scalar conservation laws". In: *ESAIM:M2AN* 55.4 (2021). URL: https://doi.org/10.1051/m2an/2021027.

[2] J. Droniou, N. Nataraj, and G. C. Remesan. "Convergence analysis of a numerical scheme for a tumour growth model". In: *IMA J. Numer. Anal.* 42.2 (2022). URL: https://doi.org/10.1093/imanum/drab016.

[3] J. Droniou, J. Flegg, and G. C. Remesan. "Numerical solution of a two dimensional tumour growth model with moving boundary". In: *J. Sci. Comp.* 85.20 (2020). URL: https://doi.org/10.1007/s10915-020-01326-6.

[4] G. C. Remesan. "Numerical solution of the two-phase tumour growth model with moving boundary". In: *ANZIAM J.* 60 (2019), pp. C1–C15. URL: https://doi.org/10.21914/anziamj.v60i0.13936.

[5] H. M. Byrne, J. A. Flegg, and G. C. Remesan. "Two phase model for compressive stress induced on a surrounding medium by an expanding tumour". In: *J. Math. Bio.* 86.1 (2022). URL: https://link.springer.com/article/10.1007/s00285-022-01851-y.

[6] G. C. Remesan C. Carstensen N. Nataraj and D. Shylaja. "Unified a priori analysis of four second-order FEM for fourth-order quadratic semilinear problems". In: *Numer. Math.* 54 (2023). URL: https://link.springer.com/article/10.1007/s00211-023-01356-w.

[7] A. Das, N. Nataraj, and G. C. Remesan. "Semi and Fully Discrete Analysis of Extended Fisher–Kolmogorov Equation with Nonstandard FEMs for Space Discretisation". In: *J. Sci. Comput.* 104.15 (2025). URL: https://doi.org/10.1007/s10915-025-02896-z.