

Aiyappan Srinivasan

Assistant Professor

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EXPERIENCE

- **Indian Institute of Technology Hyderabad** Hyderabad, India
Assistant Professor May 2022 - Present
- **Fraunhofer Institute for Industrial Mathematics** Kaiserslautern, Germany
Postdoctoral fellow Mar. 2021 - Apr. 2022
- **TIFR-Centre for Applicable Mathematics** Bengaluru, India
Postdoctoral fellow Jan. 2019 - Dec. 2020
- **Indian Institute of Science Bangalore** Bengaluru, India
Research Associate July 2017 - Dec. 2018
- **Laserwords (p)Ltd** Chennai, India
Content Developer Feb 2011 - June 2012
- **Lovely Professional University** Jalandhar, India
Senior Lecturer Aug. 2009 - May 2010

EDUCATION

- **Indian Institute of Science Bangalore** Bengaluru, KA, India
Ph.D Mathematics Aug. 2012 – Dec. 2018
- **Indian Institute of Technology Bombay** Mumbai, MH, India
M.Sc Mathematics Aug. 2007 – July 2009
- **Khadir Mohideen College (Bharathidasan University)** Adirampattinam, TN, India
B.Sc Mathematics June 2004 – Apr. 2007

PHD INFORMATION

- Ph.D Thesis Title : Unfolding Operators in Various Oscillatory Domains: Homogenization of Optimal control problems
- Adviser's name : Prof. A K Nandakumaran
- Institute : Indian Institute of Science, Bangalore

DISTINCTIONS

- Received [Fraunhofer Post Doctoral Fellowship at ITWM-Fraunhofer, Germany](#) 2021-22
- Awarded [SERB-NPDF National Post Doctoral Fellowship](#) 2020 (not availed)
- Awarded [TIFR Postdoctoral fellowship](#) 2019
- Awarded [Young Scientist Award](#) from Dr K V Rao Scientific Society, Hyderabad, 2017
- Awarded [Prof. K. Venkatachalaienger Scholarship](#) (Additional Scholarship), IISc Bangalore, 2016–2017

- Awarded [NBHM PhD Scholarship](#) 2012–2017
- Awarded [CSIR-Junior Research Fellowship](#) - June 2011 with All India Rank 75 (not availed)
- Qualified [GATE 2011](#) with All India Rank 141
- Qualified [JAM 2007](#) with All India Rank 105

PUBLICATIONS / PREPRINTS

1. (With Aditi Chattaraj, Irina Pettersson) Homogenization of an indefinite spectral problem arising in population genetics, *Journal of Differential Equations*, 2026
<https://doi.org/10.1016/j.jde.2026.114426>
2. (With Georges Griso, Julia Orlik, & Abu Sufian) Asymptotic analysis of Maxwell's equations to study shielding through a thin periodic perforated metallic layer, *Applied Mathematics and Optimization*, (94)13 (2026)
3. (With Giuseppe Cardone, Carmen Perugia) Optimal control problem stated in a locally-periodic rough domain: a homogenization study, *Applicable Analysis*, 2023 DOI: 10.1080/00036811.2023.2265967
4. (With Georges Griso & Julia Orlik) Homogenization of Helmholtz equation in a periodic layer to study Faraday cage-like shielding effects, *Complex Variables and Elliptic Equations*, 2023. DOI: 10.1080/17476933.2022.2155637
5. (With Klas Pettersson) Homogenization of a locally periodic oscillating boundary, *Applied Mathematics & Optimization*, 86 (2022), no. 2, Paper No. 14, 34 pp.
6. (With Klas Pettersson, Abu Sufian) Homogenization of a non-periodic oscillating boundary via periodic unfolding, *Differential Equations & Applications*, 14 (2022), no. 1, 31–47
7. (With Giuseppe Cardone, Carmen Perugia, Ravi Prakash) Homogenization of a nonlinear monotone problem in a locally periodic domain via unfolding method, *Nonlinear Analysis: Real World Applications*, 66 (2022), Paper No. 103537, 15 pp. DOI: 10.1016/j.nonrwa.2022.103537
8. (With A K Nandakumaran, Ravi Prakash) Semi-linear optimal control problem on a smooth oscillating domain, *Communications in Contemporary Mathematics*, Vol. 22, No. 4 (2020) DOI: 10.1142/S0219199719500299
9. (With A K Nandakumaran, Abu Sufian) Asymptotic analysis of Boundary Optimal Control Problem on a General Branched Structure, *Mathematical Methods in the Applied Sciences*, 42: 6407–6434 (2019) DOI: 10.1002/mma.5748
10. (With A K Nandakumaran, Ravi Prakash) Locally Periodic Unfolding Operator for Highly Oscillating Rough Domains, *Annali di Matematica Pura ed Applicata*, 198: 1931–1954 (2019) DOI: 10.1007/s10231-019-00848-7
11. (With Editha C. Jose, Ivy Carol B. Lomerio, A K Nandakumaran) Control Problem on a Rough Circular Domain and Homogenization, *Asymptotic Analysis*, Vol. 115, no. 1-2, pp. 19-46, 2019, DOI: 10.3233/ASY-191526

12. (With Bidhan Chandra Sardar) Homogenization of Boundary Control Problem in a Highly Oscillating Domain, *Applicable Analysis*, Vol. 98, No.16, 2783-2801-19 (2019) DOI: 10.1080/00036811.2018.1471207
13. (With A K Nandakumaran, Ravi Prakash) Generalization of Unfolding Operator for Highly Oscillating Smooth Boundary Domains and Homogenization, *Calculus of Variations and Partial Differential Equations*, (2018) 57: 86. DOI: 10.1007/s00526-018-1354-6
14. (With A K Nandakumaran) Optimal Control Problem in a Domain with Branched Structure and Homogenization, *Mathematical Methods in the Applied Sciences* **40** (2017), no. 8, 3173–3189, DOI: 10.1002/mma.4231

INTERNATIONAL VISITS

- Invited visit to the Dipartimento di Matematica e Applicazioni "Renato Caccioppoli", Università degli Studi di Napoli Federico II, Italy. December 16-21, 2019 (Funded by Università degli Studi di Napoli Federico II, Italy). Host: Prof. Umberto De Maio
- Invited visit to the Faculty of Physical Sciences and Mathematics, University of Concepción, Chile. July 16 to August 22, 2019 (Funded by FONDECYT, CONICYT, Chile). Host: Prof. Ravi Prakash
- Invited visit to the Department of Computer Science and Computational Engineering, University of Tromsø - The Arctic University of Norway, Narvik, Norway. March 12 to April 10, 2019 (Funded by University of Tromsø - The Arctic University of Norway, Narvik). Host: Prof. Klas Pettersson
- Invited visit to the Department of Computer Science and Computational Engineering, University of Tromsø - The Arctic University of Norway, Narvik, Norway. October 22 to 27, 2018 (Funded by University of Tromsø - The Arctic University of Norway, Narvik). Host: Prof. Klas Pettersson
- Invited visit to the Department of Electronics, Mathematics and Natural Sciences, University of Gävle, Gävle, Sweden. October 28 to November 2, 2018. Host: Prof. Irina Pettersson

CONFERENCES AND WORKSHOPS ORGANIZED

- "Annual Foundation School (AFS) - II ", June 01 to 27, 2026, IIT Hyderabad
- "International conference on PDEs in Action - from multi-scale to inverse problems", 22nd to 24th June, 2026, Department of Mathematics, Indian Institute of Science (IISc), Bangalore
- "A Short-Term Programme for teachers on Theory of Differential Equations", Mar 03 - 08, 2025, at IIT Hyderabad. Funded by Malviya Mission Teachers Training Programme, UGC.
- "Workshop on Multi-scale Analysis cum Conference on Differential Equations", Feb 26 - Mar 02, 2024, Department of Mathematics, IIT Ropar, Punjab, India
- "Applied Mathematics Day" - A one day workshop at IIT Hyderabad, 25th July, 2024

CONFERENCES AND INVITED TALKS

- Invited talk at "International Conference on Recent Trends in Mathematical Sciences", 21 – 23, May 2026, Department of Mathematics, Thiruvalluvar University, Vellore, TN
- Invited talk at "Second National Conference on Partial Differential Equations and Applications", March 6 – 7, 2026, Department of Mathematics, Periyar University, Salem
- Invited lectures at "Advanced Training School on Numerical Partial Differential Equations", December 1-11, 2025, IIT Tirupati, AP
- Invited lectures at "Quantitative Theory of Homogenization", 17 – 22, February 2025 IIT Bombay.
- Invited lectures at "Workshop on Multi-scale analysis cum Conference on Differential Equations" between Feb 26 - Mar 02, 2024, at IIT Ropar, Punjab. *Title: Introduction to two-scale convergence*
- Invited lectures at "Workshop on Advanced Topics in PDEs and its Applications" between December 29, 2023 - January 11, 2024 at the Department of Mathematics, Central University of Tamil Nadu, Thiruvavur, TN. *Title: Elliptic Equation, weak Solution*
- Invited lectures at "Teacher's Enrichment Workshop on Partial Differential Equations and Applications" between Nov 27 - Dec 02, 2023 at Srinivasa Ramanujan Centre, SASTRA Deemed to be University, Kumbakonam, TN. *Title: Preliminary analysis - Multi variable calculus*
- Invited talk and Chaired a session at "International Conference on Differential Equations and Control Problems" between June 15-17 2023 at the Department of Mathematics, IIT Mandi, HP. *Title: Homogenization of Helmholtz equation on a thin interface*
- Invited lecture at the discussion meeting on "Control Theory meets the Theory of Homogenization" between 28 February and 04 March 2023 at the Department of Mathematics, IIT Bombay. *Title: Brief overview of optimal control problems related to PDE*
- Invited talk at the Second International Conference on Mathematical Analysis and Computing (ICMAC 2022), 22-23 December 2022 at SSN College of Engineering, Chennai, *Title: Asymptotic analysis on a locally periodic oscillating domains*
- Invited lecture at the "Mathematics workshop for undergraduate students", National Institute of Technology, Puducherry. Sept. 29 - Oct. 03, 2022 *Title: Finite dimensional vector spaces*
- Colloquium talk at the Faculty of Physical Sciences and Mathematics, University of Concepción, Chile. June 01, 2022 *Title: Asymptotic analysis on oscillating domains*
- Invited "KAAS Seminar" talk at University of Karlstad, Sweden. August 19, 2020. *Title: Homogenization of boundary value problems on a thin structure*
- Invited talk at Dipartimento di Matematica e Applicazioni "Renato Caccioppoli", Università degli Studi di Napoli Federico II, Italy. December 19, 2019 *Title: Asymptotic study of a locally periodic rough boundary*
- Research talk at the Discussion meeting on "Multi-scale Analysis and Theory of Homogenization", ICTS-Bangalore, India. August 26 - September 06, 2019 *Title: Asymptotic study of a locally periodic oscillating boundary*

- Colloquium talk at the Faculty of Physical Sciences and Mathematics, University of Concepción, Chile. August 13, 2019 *Title: Homogenization of a locally periodic rough boundary*
- A series of lectures at the Department of Computer Science and Computational Engineering, University of Tromsø - The Arctic University of Norway, Narvik, Norway. March 12 to April 10, 2019. *Title: Homogenization in rough domains*
- Invited talk in "Second National Conference on Control and Inverse Problems" at Central University of Tamil Nadu, Tiruvarur: March 1–2, 2019. *Title: Optimal Control on Rough Domain*
- Served as a resource person in "National seminar on Analysis and its Applications" at St.Teresa's College, Ernakulam, Kerala: August 6–7, 2018. *Title: Application of functional Analysis in Differential Equations*
- Invited talk at Tata Institute of Fundamental Research-Centre for Applicable Mathematics, Bangalore, Karnataka: 26 April, 2018. *Title: Unfolding operators for general oscillating domains and Homogenization*
- Invited lecture in Two day lecture Series at Kalpataru Institute of Technology, Tiptur, Karnataka: 15-16 February, 2018. *Title: Functional Analysis and Application to Partial Differential Equations*
- Paper presentation in International Summer School on Multi-scale Analysis Methods and Applications, University of the Philippines Los Baños, July 10-22, 2017. *Title: Unfolding operator on smooth oscillating domain and Homogenization*
- Paper presentation in International Conference on Advances in Scientific Computing, IIT Madras, 28-30 November, 2016. *Title: Optimal Control Problem in a Domain with Branched Structure and Homogenization*

WORKSHOPS AND SCHOOLS PARTICIPATED

- Instructional School for Teachers - Analysis and PDE, IISc Bangalore, May 6-18, 2019 (Served as a teaching assistant)
- Instructional School for Teachers - PDE : Theory and Computation, IISc Bangalore, July 23-August 04, 2018 (Served as a teaching assistant)
- Instructional School for Teachers - Differential Equations, IIST Thiruvananthapuram, May 14-26, 2018 (Served as a teaching assistant)
- Discussion Meeting on Teaching Differential Equations in India, Indian Academy of Science Bangalore, February 26-26, 2018
- Advanced Level Workshop on Homogenization and Control: Theory & Applications, IIT Kanpur, February-27 to March-03, 2016
- Advanced Level Workshop on Controllability of Heat and Wave equations, IIT Mandi, Mandi, HP, 16-20 November 2015
- Advanced Level Workshop on Integral Equations-Solvability Analysis and Applications, JUIT, Wajnaghat, HP, 19-25 October 2015
- Workshop on Variational methods and Recent Advances in Differential equations, TIFR-CAM, Bangalore, 12-17 December 2014

- Compact Course on Navier-Stokes Equations for Incompressible Fluids, TIFR-CAM, Bangalore, 03-13 June 2014
- Advanced Workshop on Homogenization, IIST Thiruvananthapuram, 09-14 Dec 2013
- International Workshop on Advances in PDE Modeling and Computation, IIT Madras, 21-25 Oct 2013