# CP PREMCHAND

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## EDUCATION

- Indian Institute of Technology Bombay (IITB) — *Jul 2016 - Apr 2021*
  Doctor of Philosophy (direct Ph.D.)
- Anna University (PCET-Coimbatore), Chennai, India — *Aug 2010 - May 2014*
  Bachelor of Engineering in Aeronautical Engineering

## RESEARCH EXPERIENCE

- Post Doctoral Fellow, Indian Institute of Technology Bombay — *Apr 2021 onwards*
- Indian Institute of Technology Bombay, Teaching Assistantship (through Project) — *Jul 2016 - Apr 2021*
- Indian Institute of Technology Madras, Project Assistant — *Sep 2015 - Jun 2016*
- Defence Research and Development Establishment (DRDO-GTRE, Bangalore), Apprenticeship Trainee — *Jul 2015 - Aug 2015*
- ISRO-Vikram Sarabhai Space Center, Internship — *Nov 2013 - Dec 2013*

## JOURNAL PUBLICATIONS

- **Premchand, C.P.**, Krishnan, A., Raghunathan, M., Midhun, P.R., Reeja, K.V., Sujith, R. I., and Nair, V., "Lagrangian coherent structures enabled passive control in a vortex dominated thermoacoustic system", (Final manuscript is ready - yet to be submitted to a peer-reviewed journal).
- **Premchand, C.P.**, Midhun, P.R., Reeja, K.V., Raghunathan, M., Sujith, R. I., and Nair, V., “Mechanism of sound production in the flow through a square duct containing two orifice plates separated by a distance",. (Manuscript under preparation).
- Amitesh Roy, **Premchand, C. P.**, Raghunathan, M., Krishnan, A., Nair, V., and Sujith, R. I., "Critical region in the spatiotemporal dynamics of a turbulent thermoacoustic system and smart passive control", *Combustion and Flame* **226,** 274-284 (2021).
- **Premchand, C. P.**, George, N. B., Raghunathan, M., Unni, V. R., Sujith, R. I., and Nair, V., "Lagrangian analysis of flame dynamics in the flow-field of a bluff-body stabilized combustor," *Journal of Engineering for Gas Turbines and Power* **142** (1), 011015 (2019).
- **Premchand, C. P.**, George, N. B., Raghunathan, M., Unni, V. R., Sujith, R. I., and Nair, V., "Lagrangian analysis of intermittent sound sources in the flow-field of a bluff-body stabilized combustor," *Physics of Fluids* **31** (2), 025115-1 - 025115-12 (2019).

## CONFERENCE PUBLICATIONS

- **Premchand, C.P.**, Krishnan, A., Raghunathan, M., Midhun, P.R., Reeja, K.V., Sujith, R. I., and Nair, V., "Critical structures in vortex dominated thermoacoustic systems", *73rd Annual Meeting of the APS Division of Fluid Dynamics*, Virtual, 2020.
- **Premchand, C.P.**, Raghunathan, M., Midhun, P.R., Reeja, K.V., Sujith, R. I., and Nair, V., "Smart passive control of thermoacoustic instability in a bluff-body stabilized combustor: A Lagrangian analysis of critical structures", *ASME Turbo expo 2020, Virtual*, Volume 4B, Paper No: GT2020-14929, September 21–22, 2020.

- **Premchand, C.P.**, Reeja, K.V., Midhun, P.R., Raghunathan, M., Sujith, R. I., and Nair, V., "Identifying critical regions of sound production in the flow through a square duct containing two circular orifice plates", *12th Conference on Nonlinear Systems and Dynamics,* IIT Kanpur, December 12-15, 2019.
- Nair, V., **Premchand, C.P.**, Reeja, K.V., Midhun, P.R., Raghunathan, M., and Sujith, R. I., "Lagrangian analysis of intermittent sound sources in a flow-through square duct containing two circular orifice plates", *72nd Annual Meeting of the APS Division of Fluid Dynamics*, Seattle (WA), USA, Volume 64, Number 13, November 23-26, 2019.
- **Premchand, C. P.**, George, N. B., Raghunathan, M., Unni, V. R., Sujith, R. I., and Nair, V., "Lagrangian saddle point analysis in the flow-field of a bluff-body stabilized combustor", *ASME Turbo expo 2019,* Phoenix, Arizona, USA, Volume 4B, Paper No: GT2019-91713, June 17–21, 2019.

## PATENTS

- **Premchand, C. P.**, Nair, V., Sujith, R. I., George, N. B., Raghunathan, M., and Unni, V. R., "System and method for optimizing passive control strategies of oscillatory instabilities in turbulent systems using finite-time Lyapunov exponents", Application No: India: IN201941022545, USA: US16/894,052.

## PROJECTS

**Ph.D. thesis title :** Intermittent Sound Sources in a Confined Flow Field

## RESEARCH INTERESTS

- Combustion dynamics, Thermoacoustics, Fluid dynamics, Aeroacoustics, Non-linear dynamical systems

## REFEREES

1. **Prof. Vineeth Nair**, Department of Aerospace Engineering, Indian Institute of Technology Bombay, Mumbai-400076, India. Prof. Vineeth Nair is my Ph. D. advisor.
   Email: vineeth@aero.iitb.ac.in; Phone: +91-22-25767105

2. **Prof. R. I. Sujith**, Institute Chair Professor, Department of Aerospace Engineering, Indian Institute of Technology Madras, Chennai-600036, India. Prof. R. I. Sujith is one of our research collaborators. We have collaborated in projects focusing on thermoacoustic and aeroacoustic systems.
   Email: sujith@iitm.ac.in; Phone: +91-44-22574012, +91-44-22575031, +91-44-22574002.

3. **Prof. A. M. Pradeep**, Department of Aerospace Engineering, Indian Institute of Technology Bombay, Powai, Mumbai-400076, India. Prof. A. M. Pradeep is a member of my Ph. D. Research Progress Committee at IIT Bombay.
   Email: ampradeep@aero.iitb.ac.in; Phone: +91-22-25767125 (O), +91-22-25768125 (R)

## HONOURS/AWARDS/CERTIFICATIONS

- Recipient of the **2021 Student Advisory Committee Travel Award** (SACTA) from the American Institute of Mechanical Engineers-International Gas Turbine Institute (ASME-IGTI). .
- Reviewer in *Physics of Fluids, Chaos: An Interdisciplinary Journal of Nonlinear Science* and student reviewer as a part of Student Paper Review Initiative for *Turbo Expo 2021*
- Fellowship for Ph.D. program (TA through project), *Jul 2016 - Apr 2021*
  Grant Number: 16IRCCSG006, IRCC-IITB.