

Anand Zambare

IFP Energies Nouvelles, Rueil-Malmaison, France 92500
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Education:

IFP Energies Nouvelles–CentraleSupélec–Université Paris-Saclay Oct 24*
PhD in Fluid Mechanics
Thesis title: Subgrid-scale modeling of thermo-diffusive instabilities in LES of turbulent combustion
Advisor: [Olivier Colin](#) (IFPEN, France)
Co-advisors: [Cedric Mehl](#) and [Karine Truffin](#) (IFPEN, France)

Indian Institute of Technology Madras, Chennai, India Aug 21 - Dec 23
Master of Science (MS) by research in Fluid Mechanics
CGPA: 9.2/10
Thesis title: [Deflagration modelling for safety studies using PDRFoam](#)

Savitribai Phule Pune University (SPPU), Pune, India Aug 16 - Oct 20
Bachelor in Technology (B.Tech) in Mechanical Engineering
CGPA:9.12/10

Publications:

Journal articles:

- **A. Zambare**, V. D. Narasimhamurthy, T. Skjold, H. Hiskene, "[Modelling of vented hydrogen deflagrations in an ISO container using PDRFoam](#)", International Journal of Hydrogen Energy, Vol. 59, pp 251-262, 2024.
- M. Dhiman¹, **A. Zambare**¹, P. Sathiah, V. D. Narasimhamurthy, "[CFD simulations of vapour cloud explosions using PDRFoam](#)", Journal of Loss Prevention in the Process Industries, Vol. 85, 105164, 2023.
- **Zambare. A**, Swakul. V, Kulkarni. A, "[Natural Convection Heat Transfer Characteristics of the Annular Fins on the Measuring and Monitoring Devices](#)", J. Inst. Eng. India Series C, Vol. 102, 485, 2021.

Conference papers/presentations/posters:

- ❑ **Anand Zambare**, Cedric Mehl, Karine Truffin, and Olivier Colin, "Development of an SGS model for thermodiffusive instabilities", International Conference on Numerical Combustion (ICNC), Rome, Italy, 2025 (accepted).
- ❑ H. Hiskene, **A. Zambare**, A. A. Pophale, V. D. Narasimhamurthy, K. van Wingerden, T. Skjold, B. J. Arntzen, M. Lucas "45 Years of Modelling Gas Explosions with the PDR Concept – Current Status and Future Prospects", [2nd Olympiad in Engineering Science \(OES\)](#), Advances in Computational Mechanics and Applications, Springer, India, 2025.
- ❑ A. Pophale, **A. Zambare**, V. D. Narasimhamurthy, "Effect of initial turbulence on deflagration simulations using PDRFoam", International Conference on IC Engine, Propulsion, and Combustion (ICICEPC), Lecture Notes in Mechanical Engineering, Springer, India, 2025 (accepted).

¹Equal contribution

- ❑ **A. Zambare**, V. D. Narasimhamurthy, T. Skjold, H. Hisken, "Hydrogen explosion modelling using Porosity/Distributed Resistance (PDR) approach", [11th European Combustion Meeting, Rouen, France, 2023](#).
 - ❑ **A. Zambare**, V. D. Narasimhamurthy, T. Skjold, H. Hisken, "Hydrogen explosion modelling using Porosity/Distributed Resistance (PDR) approach", [14th Asian Computational Fluid Dynamics Conference](#), HAL Management Academy, Bangalore, India, 2023.
 - ❑ **A. Zambare**, V. D. Narasimhamurthy, T. Skjold, "Vapour cloud explosion modelling using the porosity distributed resistance (PDR) approach", [67th congress of the Indian Society of Theoretical and Applied Mechanics \(ISTAM\)](#), IIT Mandi, India, 2022.
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Professional Experience:

Project Associate, Department of Applied Mechanics, IIT Madras (Jan 24 - Aug 24)

- Development and Validation of an open-source deflagration model for complex geometries—PDRFoam

Research and Development (Forbes Marshall, Pune, India Jun 19 - Jan 20):

- Development work: Annular fins design for electronics cooling in steam trap monitoring system; experiments and CFD modelling

Teaching assistantships, IIT Madras

- Turbulence Modelling (AM5640) (Jan-May 24)([NPTEL](#) course)
 - Fundamentals of CFD using FVM (AM5630) (Jul-Nov 22)
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Academic projects:

Master's thesis work (Aug 21 - Dec 23):

- Worked on deflagration modelling for safety applications using open-source code—PDRFoam, in OpenFOAM environment. Code evaluation using standard benchmark experiments for hydrocarbon and hydrogen; analysis of spatiotemporal data using OpenFOAM utilities and Python scripting.

Bachelor's final year project (Feb 20 - Nov 20):

- Development of an algorithm for solving differential equations using the cubic spline wavelet method (a python code). Applied algorithm to 1 – D Linear convection, Nonlinear convection, Burgers equation, 2D scalar convection, and Stokes equation
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Tools and Skills:

- Converge, Cantera, Paraview, C++, Python, OpenFOAM, LaTeX, InkScape, Veusz
 - Introductory — High-Performance Computing (HPC), Object Oriented Programming (OOPs), and Version control using Git (or GitHub)
 - Certified DET score - 140/160; equivalent of C1 level
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Awards:

- **The Institute Research Award (IR Award)** for the best MS thesis (research), IIT Madras, 2024.