Rahul Kallada Janardhan

Curriculum Vitae

Profile

A science enthusiast, passionate about fire science. I obtained my PhD in Fire Safety Engineering and have close to a decade of experience in modelling and experimenting with fire phenomena. Master of Science in Mechanical Engineering with a major in Fluid Mechanics, and I have been involved in several experimental and modelling projects regarding various aspects of fire safety. Currently, I am working as a Fire Safety Engineer at CERN.

Education

2016 – 2022 **Doctor of Science**, *Building Technology*, Aalto University, Finland.

2013 – 2016 **Masters of Science**, *Mechanical Engineering*, Aalto University, Finland.
GPA – 4.10/5.0

2008 – 2012 **Bachelor of Technology**, *Aerospace Engineering*, SRM Institute of Science and Technology, Chennai, India.
GPA – 8.33/10.0

Work Experience

2024- **Fire Safety engineer**, *CERN*, Geneva.
Fire safety specialist for analysing fire induced radiological risks for underground experimental caverns.

2022-2024 **Safety engineer**, *GAe Engineering srl*, Torino.
Safety consultant for performance based analyses of fire-safety projects. Handling fire and evacuation simulations.

2021 – 2022 **Research assistant**, *Aalto University*.
I was involved in a project studying the ignition, effects and prevention of cooktop fires financed by the Finnish fire protection fund.

2019 **Experiment coordinator**, *Aalto University*.
Handling the planning, execution and post-processing of experimental study to investigate the cooling behaviour of fire-fighting water sprays.

2017 & 2019 **Course assistant**, *Fire Simulation and evacuation modelling*, Aalto University.

2014 – 2015 **Course Assistant**, *Finite Element Method & Fluid Mechanics(Basic course)*, Aalto University.

Academic & Research Experience

June, 2016 – September, 2022 **Doctoral research: Numerical modelling of travelling fires in large steel structures**, Aalto University.
Development of a computational fluid dynamics based modelling approach for compartment fire spread scenarios, study the impact of fire intervention on structural performance through coupled CFD-FEM analysis supported by experiments. The research objective was to provide researchers and engineers with novel modelling techniques for a pertinent problem of the future.

June, 2015 – March, 2016 **Master's Thesis: Fire Induced flows in Building ventilation systems**, Aalto University.
Experimental analysis and numerical modelling of the fire-induced pressure in buildings. The work influenced construction guidelines of low-energy buildings across the world.

January – April, 2015 **Development of a Humidity Control Chamber for Wood and Timber Engineering department**, Aalto University.
The humidity control chamber was developed to support the research at Aalto University. My work involved PCB design and etching, setup and assembly of the system and documentation of the project.

September, 2013 – May, 2014 **Product Development Project - Underwater propulsion system**, ABB Oy, Aalto University.
Developed a propulsion system for ABB based on bio-mimicry using a hydrofoil. My work involved design calculations, system assembly, testing and documentation of results.

November, 2011 – May, 2012 **Bachelor's Thesis: Design and Fabrication of a Mach-Zehnder Interferometer**, *SRM University, India*.
The thesis dealt with the fabrication of a Mach-Zehnder Interferometer used for visualization of fluid flows under laboratory conditions.

Scientific publications

1. Experimental and numerical simulations of fire pressure effects in apartment fires. Fire Technology, 53, 1353–1377 (2017). https://doi.org/10.1007/s10694-016-0641-z.
2. Fire-induced pressure and smoke spreading in mechanically ventilated buildings with air-tight envelopes. Fire Safety Journal, 91, 380-388 (2017), https://doi.org/10.1016/j.firesaf.2017.04.006.
3. Predictive Computational Fluid Dynamics Simulation of Fire Spread on Wood Cribs. Fire Technology 55, 2245–2268 (2019). https://doi.org/10.1007/s10694-019-00855-3.
4. When is the fire spreading and when it travels? – Numerical simulations of compartments with wood crib fire loads. Fire Safety Journal, 126, 103485 (2021), https://doi.org/10.1016/j.firesaf.2021.103485.
5. Coupled CFD-FE analysis of a long span truss beam exposed to spreading fires. Engineering Structures, 259, 114150, (2022), https://doi.org/10.1016/j.engstruct.2022.114150.
6. Impact of firefighting sprays on the fire performance of a structural steel members. Fire Technology (2022). https://doi.org/10.1007/s10694-022-01257-8.
7. Mild ignition and flame trajectory of horizontal transformer insulating oil spray by hot surface with different angles, Fuel, 324, Part A, 124552, (2022), https://doi.org/10.1016/j.fuel.2022.124552.

Conference presentations

1. FDS Simulation of Compartment Fire Pressures, Nordic Fire and Safety days, 2016
2. Modelling of fire spread in a tunnel using wood pallets with significance to travelling fires, FDS User Group meeting, Stockholm, 2017
3. Fire-induced pressure and smoke spreading in mechanically ventilated buildings with air-tight envelopes, IAFSS-2017
4. Modelling and Stochastic analysis of travelling fires, Nordic Fire and Safety days, 2017
5. Predictive fire spread simulations using wood cribs, Palotutkimuksenpäivät, 2019
6. Lightning talk: Use of CFD for understanding travelling fires - Fire and evacuation modelling technical conference, 2020
7. CFD simulations of fire intervention in a large structure, Palotutkimuksenpäivät, 2021

Computer skills

Basic	C, HyperMesh, Mathematica, Ansys
Intermediate	Matlab, Abaqus, Python, OpenFOAM, FORTRAN, LaTeX, AutoCAD, CATIA
Advanced	FDS, Creo

Languages

Excellent	English, IELTS - 8.0
Intermediate	Italian - Level B1-B2
Native	Hindi, Telugu, Malayalam, Tamil
Level A2	French

Areas of Interest

Fire Science, Computational Fluid Dynamics, Fire Safety Engineering, Fluid structure interactions, Dynamics of structures

Hobbies

Martial Arts, Chess, Football, Reading