



Assistant Professor, IIT Kharagpur

### Contact Information

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### Career Objective

- ✓ With a focus on research and education, my goals include
- Create, archive, and disseminate knowledge
  - Mentor people in the contest of various opportunities to learn
  - Educate the next-generation engineering students
  - Research with a highly appreciable output for the society
  - Develop a sustainable ecosystem for research

### Education

Examination	Institute	Year	CPI / %
Doctorate	<b>IIT Bombay</b>	2021	8.36
M.Tech (Thermal Science and Engineering)	<b>IIT Kharagpur</b>	2014	8.31
Graduation (B.Tech.)	<b>College of Engineering, Pune</b>	2009	7.98
H.S.C	<b>Dayanand Science college, Latur</b>	2005	93.67
S.S.C.	<b>Keshavraj Vidyalay, Latur</b>	2003	87.33

### Research Interests

Fire Safety Engineering, Spray Dynamics, Experimental Heat Transfer and Fluid Mechanics, Product Design, Improvements through Artificial Intelligence, and Engineering Education

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**Education (In detail)**

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2021 Ph.D. in Mechanical Engineering at **Indian Institute of Technology, Bombay**

**Dissertation:** Experimental investigations on performance of water mist systems in extinguishing liquid pool fires

**Key features:**

- Comprehensive characterization of pressure-swirl nozzles with X and Z-type swirl-insert
- Generalized correlations for various characteristics of the spray ensued from different nozzles with similar designs are achieved
- Experimental investigations on the performance by water mist systems
- Novel design of water mist system with base injection for storage tank fires

**Major applications:** Marine applications such as ships, submarines, etc., and the process industry

**Co-advisers:** Prof. S.V. Prabhu and Prof. Arindrajit Chowdhury

2014 M.Tech in Thermal Science and Engineering at **Indian Institute of Technology, Kharagpur**

**Thesis:** Metal hydride cooling system for an automotive application

**Key features:**

- Design of a novel reactor bed for metal hydride cooling system
- CFD analysis of heat and mass transfer through reactor bed using UDFs in Ansys (then, FLUENT 14)

**Major applications:** Automotive applications such as cars, trucks, etc.

**Adviser:** Prof. M. Ramgopal

**Design Project:** ‘Design and fabrication of water table Experiment’ for studying analogy between a shock in compressible flow and the hydraulic jump in open channel flow

**Adviser:** Prof. P.K. Das

2009 B.Tech in Mechanical Engineering at **College of Engineering, Pune**

**Thesis:** Acoustic design of a canopy for a compressor package

**Key features:**

- Conducted at **Burckhardt Compression, Pune**
- Guidance of Prof. **Colin H. Hansen, University of Adelaide, Australia**
- Acoustic Analysis by LMS Virtual Lab

**Adviser:** Prof. S. Pardeshi

### Technical Skills

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**Tools/Softwares:** ANSYS, Pro-E (PTC Creo), 6SigmaET, SolidWorks, AutoCAD, Matlab, FDS, EES, and Image J

**Experimental skills:** Particle/droplet image analyzer (*PDIA*), Infra-red thermography, Data acquisition system, Flow visualization, and Transient pressure and temperature

### Industrial Experience

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Deputy Engineer (Development and Engineering) at **Bharat Electronics Limited**, Maharashtra (July 09 – April 12)

**Key contribution:** Design and development (integration) of RADAR systems and cooling system inside shelter for electronic equipment

- Reccelite Control system for Indian Air Force (**IAF**) with **RAFAEL advanced Defence system Ltd, Israel**
- Real-time Image Ground Exploitation System (RIGES) for Spanish Army with **ELTA Systems Ltd, Israel Aerospace Industries (IAI), Israel**
- Medium Radar Projects for IAF with **ELTA Systems Ltd, IAI, Israel**

**Outcome and Value:** Project leadership and management, effective written and oral communication, vendor development, working with foreign groups (**Israeli** partners)

### Research Experience

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Post-Doctoral Researcher in the Department of Mechanical Engineering at **National Yang Ming Chiao Tung University, Taiwan** (June 22– Dec 22)

**Key contribution:** Disseminating knowledge, mentoring students, writing funding proposals, numerical investigations on developing heat resistant material and heat transfer in brazed plate heat exchanger (BPHE), experimental investigations on cooling of 1U server through single-phase immersion cooling system, *etc.*

Institute Post-Doctoral Fellow in the Dept. of Mechanical Engineering at **IIT Bombay**, Mumbai (Oct 21– April 22)

**Key contribution:** Disseminating knowledge, mentoring students, designing and developing experimental setups for UG lab, writing funding proposals, teaching assistantship, experimental investigations on heat transfer in an internal flow with porous medium, *etc.*

Research Associateship at **IIT Bombay**, Mumbai (Sept 20– Nov 20)

**Key contribution:** Disseminating knowledge

### Teaching Experience

Assistant Professor in the Department of Mechanical Engineering at **Visvesvaraya National Institute of Technology (VNIT)**, Nagpur (Dec 2022 – May 2023)

**Responsibilities:** Teaching Engineering Drawing, Refrigeration and Cryogenics, Advanced Refrigeration and Air Conditioning, conducting Fluid Mechanics lab and Advanced RAC lab, *etc.*

Associate Professor in the Department of Mechatronics Engineering at **Sanjivani College of Engineering**, Kopergaon (Nov 20 – Sept 2021)

**Responsibilities:** Teaching Engineering Graphics and Electric Machines, lab development, design and development of courses: Electric Machines and Entrepreneurship Development Program, organizing scholarly activities such as workshop, mentoring UG students, *etc.*

Assistant Professor in the Department of Mechanical Engineering at Pimpri-Chinchwad College of Engineering and Research (**PCCOER**) (July 14 – Dec 14)

**Responsibilities:** Teaching Engineering Graphics and mentoring students

#### Position of Responsibilities (Teaching Assistantship)

Course code and name	Duration	No. of students	Institute	Responsibilities
ME 307 Mechanical measurements lab	[July-Nov 2015, 2016, 2018, and 2019]	120	<b>IIT Bombay</b>	Conducting experiments after briefing the theory, evaluating manuals, conducting the practical exam at the end, and evaluation of the same
ME 657: Thermal and Fluids Engineering lab	[Jan-April 2016]	30 (PG)		
ME 372: Heat transfer lab	[Jan-April 2019]	120		
ME 213: Manufacturing practice lab	[Jan-April 2017]	120	<b>IIT Dharwad</b>	Teaching AutoCAD, conducting tests, and evaluation of the same Evaluating mid-sem and end-sem papers, conducting seminars in the classroom, <i>etc.</i> Establishing the experimental rigs, preparing lab manual, general lab responsibilities, and mentoring a group of students for a course-project
ME 119: Engineering graphics and drawing	[Jan-April 2017]	120		
ME 203: Fluid mechanics	[July-Nov 2017]	40		
ME 224: Fluid mechanics lab	[Jan-April 2018]	40		

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**Publications**

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**Journal Publications:**

- Shrigondekar, H., Chowdhury, A., & Prabhu, S. V. (2018). Characterization of a simplex water mist nozzle and its performance in extinguishing liquid pool fire. *Experimental Thermal and Fluid Science*, 93, 441-455 <https://doi.org/10.1016/j.expthermflusci.2018.01.015>
- Shrigondekar, H., Chowdhury, A., & Prabhu, S. V. (2020). Characterization of solid-cone simplex mist nozzles. *Fire Safety Journal*, 111, 102936 <https://doi.org/10.1016/j.firesaf.2019.102936>
- Shrigondekar, H., Chowdhury, A., & Prabhu, S. V. (2021). Performance by Various Water Mist Nozzles in Extinguishing Liquid Pool Fires. *Fire Technology*, 57(5), 2553-2581 <https://doi.org/10.1007/s10694-021-01130-0>
- Shrigondekar, H., Chowdhury, A., & Prabhu, S. V. (2021). Performance of water mist system with base injection in extinguishing small container fires. *Journal of Loss Prevention in the Process Industries*, 71, 104448 <https://doi.org/10.1016/j.jlp.2021.104448>
- Raj, V. C., Shrigondekar, H., Dixit, B., Mukunda, H. S., & Prabhu, S. V. (2022). The Effect of Surrounding Water on the Burning Rates of Pool Fires. *Fire Technology*, 58(3), 1689-1709 <https://doi.org/10.1007/s10694-022-01217-2>
- Shrigondekar, H., Lin, Y. C., & Wang, C. C. (2023). Investigations on performance of single-phase immersion cooling system. *International Journal of Heat and Mass Transfer*, 206, 123961 <https://doi.org/10.1016/j.ijheatmasstransfer.2023.123961>

**Journal Manuscripts Under Review:**

- Raj, V. C., Kuntikana Pramod, Shrigondekar H, Sreedhara S, Prabhu SV (2021), Heat transfer characteristics of unconfined ceilings jets, *IJHMT*
- Talapati R. J., Katti V. V., Baghel K, Shrigondekar H (2023), Influence of inclined unconfined circular air jet impingement on local heat transfer characteristics of smooth flat plate, *ICHMT*

**Manuscripts in Preparation:**

- Review paper on ‘Characterization of solid-cone spray for fire-fighting’
- Review paper on ‘Performance of various water mist systems in extinguishing open pool fires’
- Paper on ‘Simulation of natural cooling of LED’
- Book on ‘How to write a scientific paper’
- Book on ‘Thermo-Fluid Engineering’

**Conference Presentations:**

- Shrigondekar H, Chowdhury A, Prabhu SV, Characterization of a pressure-swirl nozzle and its application in extinguishing diesel pool fire, 7<sup>th</sup> International and 45<sup>th</sup> National Conference on Fluid Mechanics and Fluid Power, (FMFP2018), IIT Bombay, December 10-12, 2018, Paper No. 731
- Shrigondekar H, Chowdhury A, Prabhu SV, Effect of fuel and inner design of pressure-swirl nozzle on its extinction performance, 3<sup>rd</sup> European Symposium on Fire Safety Science, (ESFSS2018), Nancy, France, September 12-14, 2018, Paper No. 203939
- Shrigondekar H, Chowdhury A, Prabhu SV, Characterization of full cone, pressure swirl nozzle utilized for extinction of diesel pool fire, 24<sup>th</sup> National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTTC 2017), BITS Pilani Hyderabad, December 27-30, Paper 19-0348

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**Honors and awards**

- Secured **99.57** percentile in GATE ME 2012 amongst **1,12,320** students
- Undergone the **project training** in **Burckhardt Compression, Pune** for a Management project in addition to the B.Tech project from Jan to April 2009
- Secured **17<sup>th</sup>** rank in the merit list of Latur HSC Board in 2005
- Participated in Indo-US workshop on Fabronics 2012 jointly organized by **IIT Kharagpur** and **BESU, Shibpur**
- **First prize winner** of model making (X-STRESS an event in the Civil department) in **COEP**
- **Spending Treasurer** in Mess managing committee of hostel mess at **COEP**
- Participated in Telematches (a unique event in Maharashtra: Regatta) in **COEP**

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**Certifications**

- GIAN course: 'Fire Dynamics and Fire Protection' by Prof. Jose Torero (**University College London, England**) at **IIT Madras** in 2016
  - ✓ Secured the highest grade 'S' (grade points: 10)
- **Certified Reliability Professional (CRP)** examination conducted by **STQC**, Chennai
  - ✓ Secured 'A+' grade

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**Memberships and Affiliations**

- Solar Energy Society of India (LM: 2622)
- Indian Society for Technical Education (LM: 132960)
- Indian Society for Heat and Mass Transfer (LM: 1507)
- International Association of Engineers (LM: 318934)