

CURRICULUM VITAE

DIGVIJAY SINGH

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Career Objective:

To build a challenging career with honesty and loyalty by translating my experience, knowledge, skills and abilities into value for an organization. To obtain a position of responsibility that utilizes my skills and experience and keen to work in an environment where I can enrich my knowledge.

Academic and Professional Qualifications:

Qualification	Branch/ Subjects	Passing Year	Institute/Board/University	Percentage/ CGPA
PhD (Thesis submitted)	Mechanical Engineering	2022	Indian Institute of Technology Kanpur	7.00/10
M.E.	Mechanical Engineering	2013	Birla Institute of Technology and Science Pilani (Bits Pilani-Campus)	8.08/10
B.Tech.	Mechanical Engineering	2010	United College of Engineering. & Research, Greater Noida (UPTU Lucknow)	69.64
Intermediate	PCM	2006	Lucknow Public School, Lucknow	76.60
High School	Science	2004	Lucknow Public School, Lucknow	78.16

Research Work:

I am working in the CFD modeling and experimental work of the thermal spray process along with lab-scale experiments. It includes knowledge of various fields like heat transfer, fluid dynamics, thermodynamics, solidification modeling and material science. In my work, I have to explore the various significant physics during the impact of high-velocity molten droplets and low-velocity water droplet impacting on a substrate. The problem includes rapid solidification model, nucleation, free surface tracking, solid-liquid interface tracking, undercooling, non-equilibrium solidification kinetics and full coupling of heat transfer, fluid flow and rapid solidification. My Ph.D. thesis has been submitted in April 2022.

Ph.D thesis topic: *“Numerical and Experimental Investigation of Rapid Solidification Involved in Droplet Impact on Substrate and Pore Formation in Thermal Spray Coating”*

Ph.D. Subjects: Computational Fluid Dynamics, Advance CFD, Casting and Solidification, Viscous Flow Theory, Conduction and Radiation, Mechanical Properties of Material, Additive Manufacturing.

M.E. Subjects: Computational Fluid Dynamics, Computational Heat Transfer, Advanced Heat Transfer, Dynamics and Vibrations, Finite Element Method, Advanced Engineering Mathematics, Quality Control & Quality Assurance, Machine Tool Engineering, Robotics and Control, CAAD.

Experience

1. Currently working as **Sr. Student Research Associate** in a Project: Towards Realization of Additive Manufacturing of Aerospace Structural Component in India. Sponsor: **Science & Engineering Research Board (IMPRINT II scheme)** at the Department of Mechanical Engineering, IIT Kanpur under Dr. Arvind Kumar's supervision from March 2019 to date (**3 Years 1 month completed**).
2. Worked in **ABES-IT Ghaziabad** as **Assistant Professor** in Mechanical Department (Grade pay 7000/-) from Aug 2013 to July 2014 (**1 Year**).
3. Six-month internship at **Skoda Auto India Private Limited, Bangalore** as a PGET from Jan 2013 to June 2013 (**6 Months**).
4. Worked in **Jay Ushin Ltd, Gurgaon** (a joint venture with USHIN LTD, JAPAN) as a GET in Production Department from June 2010 to July 2011 (**1 Year, 1 Months**).

List of Publications:

Journal Paper:

1. **Digvijay Singh**, Arvind Kumar, Numerical and Experimental Analysis of Rapid Solidification Considering Undercooling Effect during Water Droplet Impact on a Substrate. Thermal Science and Engineering Progress Volume 20, 1 December 2020, 100722.
<https://doi.org/10.1016/j.tsep.2020.100722>
2. Rajesh Kumar Shukla, Alok Kumar, Rajesh Kumar, **Digvijay Singh**, Arvind Kumar, Numerical Study of Pore Formation in Thermal Spray Coating Process by Investigating Dynamics of Air Entrapment. Surface and Coatings Technology Volume 378, 25 November 2019, 124972.
<https://doi.org/10.1016/j.surfcoat.2019.124972>
3. **Digvijay Singh**, Alok Kumar, Arvind Kumar, Numerical Study of parametric effect on Dynamics of Air Entrapment and Pore Formation. Colloids and Surfaces A: Physicochemical and Engineering Aspects (2021) (Under review)
4. **Digvijay Singh**, Arvind Kumar, Numerical Analysis of Single and Sequential Dense and Hollow Droplet Impact on a Substrate Thermal Science and Engineering Progress (2022) (Under review)
5. **Digvijay Singh**, Arvind Kumar, Development of plasma spraying deposited yttria-stabilized zirconia topcoat for thermal barrier coating. Surface and Coatings Technology. (Under preparation)

Conference Papers:

1. **Digvijay Singh**, Arvind Kumar, Undercooling Effect in Solidification Modeling of Single Splat Formed by Impact of a Hollow Droplet on a Flat Substrate, *Proceedings of the 9th Asian Thermal Spray Conference (ATSC 2018)*, November 16-18, 2018, Nanyang Technological University, Singapore, Singapore. ISBN: 2630-5208
2. **Digvijay Singh**, Jaiprakash Kumawat, Alok Kumar, Arvind Kumar, Modeling of solidification of water droplet impact on a substrate with undercooling effect, *Proceedings of the 5th International Conference on Computational Methods for Thermal Problems (ThermaComp2018)*, July 9-11, 2018, Indian Institute of Science, Bangalore, India. ISBN: 2305-6924
3. **Digvijay Singh**, Rajesh Kumar Shukla, Arvind Kumar, Dynamics of entrapped air bubble during impact of high-velocity molten droplet on a solid substrate, *Proceedings of the 24th National and 2nd International ISHMT-ASTFE, Heat and Mass Transfer Conference (IHMTTC-2017)*, December 27-30, 2017, BITS Pilani, Hyderabad, India. ISBN: 978-1-56700-478-6, pages 981-985. DOI: 10.1615/IHMTTC-2017.1360

4. Alok Kumar, **Digvijay Singh**, Arvind Kumar, PIV Study to Analyze Natural Convection during Directional Solidification of a Metal-Alloy Analogue, *Proceedings of the 6th International and 43rd National Conference on Fluid Mechanics and Fluid Power(FMFP-2016)* December 15-17, 2016, MNNITA, Allahabad, U.P., India. ISBN: 978-93-5267-408-4

Talk

Presented a talk on "Studies on Droplet Impact and Solidification on Substrate Towards Coating Formation Application", on **Research Scholar Day 2018**, organized by Association of Mechanical Engineering, Department of Mechanical Engineering, IIT Kanpur.

Global Initiative of Academic Networks (GIAN)

Sl No	Course	Institute	Foreign Faculty	Duration	Course Coordinator
1	Combustion: Science, Technology, and Processes	IIT Kanpur	Prof. Thierry Poinot (France)	May 09-18, 2016	Dr. Santanu De sde@iitk.ac.in
2	Thermal Sprayed Coatings and Composites: Science, Engineering and Applications	MNNIT Allahabad	Prof. Arvind Agarwal (United States of America)	June 06, 2016, to July 01, 2016	Prof. Anuj Jain (anujjain@mnnit.ac.in)
3	Boiling and Condensation: Theory and Applications	IIT Kanpur	Prof. Amitabh Narain (United States of America)	September 06-14, 2016	Prof. P. S. Ghoshdastidar (psg@iitk.ac.in)

TEQIP Short Term Course

Sl No	Course	Institute	Duration	Course Coordinator
1	Additive Manufacturing	IIT Kanpur	February 11-15, 2019	Dr. Arvind Kumar Dr. N. Sinha arvindkr@iitk.ac.in
2	Thermal Energy Storage for Effective Energy Management	IIT Kanpur	February 10-14, 2020	Dr. Arvind Kumar arvindkr@iitk.ac.in
3	Multi-Scale Computational Fluid Dynamics: Fundamentals and Applications	NIT Jalandhar	September 21-25, 2020	Dr. Rajan Kumar drrajankumarnitj@gmail.com

AICTE Training and Learning (ATAL) Academy Online FDP

Sl No	Course	Institute	Duration	Course Coordinator
1	Sustainability Engineering	IIT Jammu	October 26-30, 2020	Dr. Vijay Pal vijay.pal@iitjammu.ac.in
2	Energy Engineering	IIT Roorkee	November 23-27, 2020	Dr. Amit Bhosale achbhosale@hre.iitr.ac.in
3	CFD	L B S College of Engineering, Kasaragod	January 4-8, 2021	Prof. Swaraj Kumar B. Dr.Aboobacker Kadengal swarajpattambi@gmail.com
4	Energy Storage	Institute of Aeronautical Engineering, Hyderabad	May 17-21, 2021	Dr. K. Hari Prasad hariprasad.kamatam@gmail.com
5	Waste Valorization towards a Sustainable Environment	NIT Durgapur	June 14-18, 2021	Dr. Bimal Das bimal.das@che.nitdgp.ac.in
6	Manufacturing: Hindsight to Foresight 3D Printing & Design Thrust Areas	BITS Pilani	July 16-20, 2021	Dr. Tribeni Roy tribeni.roy@pilani.bits-pilani.ac.in

Seminar

Sl No	Seminar	Institute	Duration	Course Coordinator
1	Emerging Trends in Welding Technology: Addressing Complexity of Al & Ti Metals	IIT Kanpur Organized by Fronius India Pvt. Ltd	August 10–11, 2019	Prof. J. Ramkumar jrkmur@iitk.ac.in
2	Next-Generation Electronic Systems: Heterogeneous Integration, Thermal and Power Management, Related Machine Learning	Binghamton University (State University of New York), IIT Madras and IIT Ropar	October 6-8, 2020	Dr. Arvind Pattamatta Dr. Rohit Sharma Dr. Krishnaswami "Hari" Srihari astromha@binghamton.edu
3	Webinar on Welding Based Additive Manufacturing Fundamentals and Research Challenges in India	Sri Ranganathar Institute of Engineering and Technology, Coimbatore	15 th October 2020	Dr. S. Om Prakash sowrirajan@cietcbe.edu.in

4	Nanotechnology and Functional Materials (NTFM-Phase-IV)	S V College of Engineering, Tirupati, Andhra Pradesh	November 2 - 7, 2020	Dr. M. Chandra Shekhara Reddy
5	National Level Quiz on Manufacturing Processes	Murugappa Polytechnic College, Chennai, Tamilnadu	1 st November 2020	Er. G Nallaiya
6	Industrial Approach of Fatigue Testing in Product Development Process	Mohamed Sathak A. J. College of Engineering	8 th December 2020	Dr. K. S. Srinivasan
7	Teaching Engineering Graphics using ICT Tool	Mohamed Sathak A. J. College of Engineering	2 nd December 2020	Dr. K. S. Srinivasan
8	Application of Machine Learning and Dynamical Systems Approach for Early Detection and Control of Combustion Instabilities	Jadavpur University, Kolkata, India and Pennsylvania State University, State College, USA	January 5 – 7, 2021	Dr. Aranyak Chakravarty aranyak.chakravarty@jadavpuruniversity.in

Research Practice:

- Model-based fault diagnosis of a **Rotor-Bearing System** for misalignment and unbalance under steady-state condition
- Predator-Prey Model.in MATLAB
- Finite Element Analysis of Heat Exchanger in MATLAB and ANSYS
- Designing of Lower Damper Bracket on U.G. & IDEAS from **RDSO Lucknow** in June-July 2009
- Major Project on Regenerative Breaking System in Hybrid Engine
- Moving-Mesh Methods for One-Dimensional Hyperbolic Problems using CLAWPACK
- Design of a single-point cutting tool in MATLAB (GUI)

Programming:

ANSYS -FLUENT, FORTRAN, MATLAB, MINITAB, PRO.E, Open-FOAM

Achievements:

- Obtained the GATE Fellowship during the period 2008-10 in M.E. and in the period 2014-2019 in Ph.D.
- Best teaching award for the year 2013-2014 in **Mechanical Department, ABES-IT Ghaziabad**
- Qualified GATE 2011, GATE 2012 & GATE 2014 with gate score 365, 316 & 390, respectively
- House captain in school
- Won first prize in Essay Competition
- Won two silver medals in high school and intermediate for honors
- Won Gold medal in swimming Competition

Interest & Hobbies:

- Playing Cricket, badminton & Chess
- Swimming, Reading newspaper
- Cooking

Self Description:

- Quick learner
- Flexible- can work in a fast-paced, iterative environment
- Self-motivated, cooperative & always positive
- Have a result-oriented approach to finish a given project time with utmost perfection

Name and Contact Details of Referees

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3. Dr. Rajesh Kumar
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Personal Profile:

Languages Known: English, Hindi

Date of Birth: 12th, June 1988

Sex: Male **Permanent**

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8/3, Indrapuri, Alambagh, Lucknow, U.P.-
226023

Declaration

I declare that all the information provided here is correct to the best of my knowledge and belief and I promise to abide by all the norms laid down by your esteemed organization.

DATE & PLACE: 15/04/2022

SIGNATURE