

Curriculum vitae

Dr. B. VARUN KUMAR

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Education

- Ph.D. in Heat Transfer in a topic of “*Investigation of Thermo-Hydraulic Performance of Various Ribs Mounted in a duct*”, completed in 2022.
- M.E -Thermal Engineering completed in Government College of Engineering –Salem with 8.3 CGPA in 2009.
- B. Tech - Mechanical Engineering completed in Dr. M.G.R Engineering College, Chennai with CGPA 8.0 in 2007.

Employment:

- Velammal College of Engineering and Technology – Madurai.
Asst. Professor / Mechanical Department (From June-2013 to till now)
- Vel-Tech High-Tech Dr. Rangarajan Dr. Sakunthala Engineering College – Chennai.
Asst. Professor/Mechanical Department - 2 Years (May 2011 to May 2013)
- VSB Engineering College – Karur.
Asst. Professor/ Mechanical Department – 1 Year (May’2010 to May 2011)
- *Subjects Handled:*
 1. Thermal Engineering
 2. Heat and Mass transfer
 3. Advanced IC Engine
 4. Gas Dynamics and Jet Propulsions
 5. Power plant engineering
 6. Engineering Graphics
 7. Engineering Thermodynamics + PG Thermal Subjects
- *Additional Responsibilities:*
 1. Criterion Coordinator of NBA and NAAC in Current working College.
 2. MSME – Project In-charge
 3. Asst HOD in Veltech Engg College, Chennai
 4. Management committee member (Madurai Zone) & Faculty advisor of SAE (8 Years)
 5. Final year project coordinator/ Supervisor of III-year mini project

International Journal Publications:

1. “*Enhancement of heat transfer in SAH with polygonal and trapezoidal shape of the rib using CFD*” in **Energy**, 2021 - **Impact Factor -8.85.**
2. “*Experimental analysis of solar air heater using polygonal ribs in absorber plate integrated with phase change material*” in **Thermal Science** 2021 – **Impact Factor – 1.67.**

3. “Performances of solar air heater using polygonal and trapezoidal rib absorber plate for augmentation of heat transfer” in **Tierärztliche Praxis**, 2020. - **Impact Factor - 0.45**
4. “A Performance Evaluation of a Solar Air Heater Using Different Shaped Ribs Mounted on the Absorber Plate—A Review” in **Energies**, 2018 - **Impact Factor -3.1.**
5. “Numerical and Experimental Investigation of Convective Heat Transfer of Horizontal Cylindrical Pipe” in **GISCIENCES**, 2022 – **Impact Factor- 6.1.**
6. “Application of Artificial Neural Network with various algorithms tools in Numerous Sectors – A Review” in **periodicodi mineralogia**, 2022 – **Impact Factor – 1.3.**
7. “Implementation of Lean Manufacturing Tool In Dairy Industry: A Review” in **International Journal of Innovative Research in Science Engineering and Technology**, ISSN (Online): 2319 – 8753.

Patent publication:

1. Provisional Patent registered for “Breathable Cooling Jacket for Covid Frontline Fighters” – **CSR No -96.**

International Conferences:

1. Presented a paper on the topic of “A CFD approach – investigating thermal performances in a Solar Water Heater using arc shaped rib with Ga-Cu and Ga-CNT nanofluids” in First International IEASMA Conference On Engineering, Applied Sciences And Management, Buraimi, Sultanate of Oman on March 27-28 2021.
2. Presented a paper on the topic of “Augmentation of Heat Transfer in the Rectangular Duct using Nanofluid by Varying Ribs Surface” at the First International IEASMA Conference on Engineering, Applied Sciences and Management, Buraimi, Sultanate of Oman on March 27-28 2021.
3. Presented a paper on the topic of “Review paper-enhancement of heat transfer using ribs” in International Conferences of Research Techniques in Engineering- ICRTE-2016, Chennai on 23 October 2016.
4. Presented a paper on the topic of “A Review paper-Importance of ribs in duct for augmentation of heat transfer” in 2nd International Conferences on Thermal Energy and Environment [INCOTEE-2016] Kalasalingam University, Krishnan kovil on 25 & 26th March 2016.
5. Presented a paper on the topic of “Performance of Upgrade IC engine using water and Green Electricity” in International Conferences on Advances in Energy Engineering [ICAEE 2013] in DR MGR University, Chennai on 4 & 5th April 2013.

Ph.D. Work:

“Investigation of Thermo-Hydraulic Performances of Ribs Mounted in Square Duct” – Research conducted using both Numerical (CFD Fluent simulation) and Experimental methods.

The objective of my research work – augment the heat transfer rate in SAH by implementing a rough geometry – “polygonal and trapezoid” shapes of ribs in the absorber plate of SAH. The performances of the average Nusselt number, friction factor, and thermo-hydraulic parameters (THP) were investigated, and significant findings are accepted in reputed journals. The research work was carried out in both numerical (Fluent software-CFD) and experimental approaches. In addition, the investigation

extended using Paraffin wax was as a PCM integrated with SAH to analyze the rapid charging in SAH owing to ribs and to increase the heat discharge duration from PCM to absorber plate in SAH.

P.G Project Detail:

“Performance of Window Air Conditioning System Using Mixed Refrigerant.”

My project work focused to identify an alternative refrigerant instead of domestic R - 22 to attain a better COP performance and investigation was completed using numerical methods. A combination of two refrigerants R 22 and R 290 blended in 3 different proportions for verdict better performances of COP. The numerical investigation has done by using “REPROP and Cycle D” software to get the result for blended gas and identify higher performance.

U.G Project Detail:

“Development of single flap valves as sealing equipment for cement plant grinding & hot air system”

The project objective was to design and development of “Single Flap Valves” in cement blending chamber, that was used in the cement plant, Chennai. Inevitably blend air and cement naturally with the various ratio in that region for preparing construction cement. My objective is to arrest air before entering the chamber by using flap values. The company guides us to design three different shapes of flap values to fix in the chamber were located 50 and 100 meters above sea level and validated among them. We submitted our project to LNV Technology Company, and they appreciate us.

Mini Project:

“Lubrication Methods for Large Open Gear Drives”

Project Details

MSME Project Won:

Project Summited in the title of “*Conveyor Fed Fish Scaling Machine*” worth 5 lakhs to the Ministry of Small and Medium Enterprise and shortlist for funding. Received 6 lakhs from MSME Govt of India. [Ref No.3 (1)/2014/IINC/12th Meet Dated: 21.5.2014].

MNRE Project Submitted:

Funded Project worth 24 lakhs was shortlisted from the national level and presented in the Ministry of New Renewable Energy MNRE in Dec 2017 on the topic of “*Numerical Investigation of Various Shape of Rib in absorber plate in solar air heater*”. Received positive response to revise the geometry and fund amount.

DST Project Submitted:

Project proposal submitted to the Department of Science and Technology in a topic of “*Smart Solar Cooker*” worth of 23 lakhs.

International Project Competition:

Projected presented in “VISAI 2013” in the topic of “*Pedal Power-Economic Solutions for Green lifestyle*” which was held in Veltech High-Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai.

Achievements

- Send a funding project proposal to MNRE, MSMSE, CSIR, etc.
- Send a MODROPS for Metrology & Measurement to AICTE
- Organizing SAE club
- Coordinator of ISO & Criteria coordinator of NBA/NAAC files.
- Participated in Solid Modeling at Kumaragura College of Engineering, Coimbatore.

Software Learned:

1. “ANSYS- CFD - Fluent” for analyzing characterization of heat flow and pressure drop.
2. “PYTHON” for programming mechanical formulas.
3. “Solid works” for geometry construction.
4. “Tech Plot” to generate results & “Gambit” for analysis and Meshing.
5. Basic “Auto Cad” for geometry construction.

National Conferences:

1. Presented a paper on the topic of “*Design and Fabrication of Pneumatic Engine*” in 2nd National Conferences on Advances and Innovation in Civil and Mechanical Engineering [AICME 2012], Veltech High-Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai on 17th August 2012.
2. Presented a paper on the topic of “*Alternative fuel sources for diesel engines*” in 2nd National Conferences on Advances and Innovation in Civil and Mechanical Engineering [AICME 2012], Veltech High-Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai on 17th August 2012.
3. Presented a paper on the topic of “*Regenerative suspension system*” in 2nd National Conferences on Advances and Innovation in Civil and Mechanical Engineering [AICME 2012], Veltech High-Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai on 17th August 2012.
4. Presented a paper on the topic of “*Design and fabrication of solar car*” in 2nd National Conferences on Advances and Innovation in Civil and Mechanical Engineering [AICME 2012], Veltech High-Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai on 17th August 2012.
5. Presented a paper on the topic of “*Optimization of lubrication system in drive axles towards green economy*” in 2nd National Conferences on Advances and Innovation in Civil and Mechanical Engineering [AICME 2012], Veltech High-Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai on 17th August 2012.
6. Presented a paper on the topic of “*Performance of Window Air Conditioning System Using Mixed Refrigerant*” in 6th National Conference for Research Scholar on Application of Emerging Technologies from ISTE Chapter in Adhiyaman College of Engineering, Hosur on 6 & 7th April 2009.

7. Presented a paper on the topic of “*Performance of Window Air Conditioning System Using Mixed Refrigerant*” in National Conferences on Recent Trends in Mechanical Engineering in Paavai Engineering College, Namakkal on 24 & 25 April 2009.

International Seminar:

1. Attended International Seminar on the topic of “*Managerial Leadership – Making a Differences*” in Anna University Regional Campus, Madurai on 7th January 2017.

National Seminar:

1. Attended National Seminar on “RETRIC 2016 –Recent Trends in Communication Technologies “on the topic of “*Embedded in Real-Time systems*” in Velammal College of Engineering and Technology, Madurai on 26th August 2016.

Attended FDP/Workshop:

1. Attended Five days FDP in a topic of “*INDUSTRY 4.0 & SMART MANUFACTURING*”, in Padm. Dr. V. B. Kolte College of Engineering, Malkapur during 31st May to 4th June 2022.
2. Attended 1 Day Workshop on “*LITHIUM-ION BATTERY TECHNOLOGY AND DEVELOPMENT*” in SSN College of Engineering on 27th June 2022.
3. Attended Five days Training program on topics of “*Augmented Reality & Virtual Reality in Mechanical Engineering*” in Sree Buddha College of Engineering, Pattoor., on 8 – 12 November 2021.
4. Attended Five days Training program on topics of “*First Computerized fluid dynamics course*” in Indian Institute of Technology, Mumbai, on 25 – 30 June 2018.
5. Attended Three days Training programs on topics of “*Fluent ANSYS*” in MEPKO Engineering College, Sivakasi, on 6 - 8 March 2017.
6. Attended TEQIP II Sponsored One-week workshop on topics of “*Nano-Materials for Energy and Environment*” in the National Institute of Technology, Tiruchirappalli on 6-11 June 2016.
7. Attended One-day “*Workshop on Teaching Methodology*” Organized by ISTE Chapter of Velammal College of Engineering and Technology, Madurai on 9th July 2013.
8. Attended a two-day workshop on the topic of “*Entrepreneurship Development*” “Sponsored by TEQIP in Salem Government College of Engineering on 11 & 12th March 2009.

Organized Program:

1. Organized a webinar on the topic of “*Road Safety Awareness Program*” to the benefit and road safety to the students in August collaborated with Honda. (2020, 2021 & 2022)
2. Organized International Conferences on the topic of “*International Conference in Innovative Research in Thermal and Manufacturing Engineering - ITRME-19* (funded from AICTE) on October 17-18th 2019.
3. Organized Student convention Tier II event from “*SAE CLUB*” in Velammal College of Engineering and Technology in February 2019
4. Organized a one-day Seminar on the topic of “*Thermal day*” in March 2017 to benefit II & III students.

5. Organized workshop from “*SAE CLUB*” in Velammal College of Engineering and Technology in June 2016.
6. Delivered a Session in a one-day Seminar on the topic of “*Fluid & Heat Day*” to benefit II & III students in September 2016.
7. Organized Guest Lecture on the topic of “*Automobile Engineering* “, “*Industry 4.0*” and “*Smart Manufacturing*” to benefit students.
8. Organized National Conference “2nd National conferences on Advances and Innovation in Civil and Mechanical Engineering [AICME 2012]” in Veltech High-Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai 17th August 2012
9. Organized a Seminar on the topic of “*Thermal Engineering*” to benefit II & III students in October 2011.

Responsibilities and Duties:

- Ensuring student awareness of course objectives, approach, and evaluation techniques
- Arranging Industrial Visit through SAE Club
- Carrying out regularly scheduled instruction
- Tutoring and Academic counseling of students
- Providing a learning environment that makes effective use of available.
- Resources, work experience, and field trips from SAE Club.
- Evaluating student progress/achievement, assuming responsibility for the overall
- Assessment of the students’ work within assigned courses.

Professional Membership:

- A Management Committee Member (Madurai Zone) & Faculty advisor in SAE Club (*Society of Automotive Engineer*) from 2012 onwards.
- A member in IAENG –International Association of Engineers