

## Faculty Profile

<b>Name of Faculty</b>	Dr. Saravanan V.
<b>Department</b>	Mechanical Engineering
<b>Qualification</b>	ME, Ph.D
<b>Designation</b>	Associate Professor
<b>Area of specialization</b>	Thermal Science and Engineering
<b>Date of Joining BNMIT</b>	21-07-2014
<b>Nature of Association (Regular/Contractual/Adjunct)</b>	Regular
<b>e-mail</b>	saravananv@bnmit.in, saravanan.venkatesh@gmail.com
<b>No. of years of Experience</b>	Teaching:8.6 years



### Academic Qualifications

- **Ph.D.**(2018): “CFD Analysis of Flow and Heat Transfer Over Pin Fin Heat Exchanger”  
Department of Mechanical Engineering, Bangalore University, UVCE, Bangalore,
- **ME.** (2008): Thermal Science and Engineering, Department of Mechanical Engineering, Bangalore University, Bangalore, India (**I Class**).
- **BE.** (2003): BTLIT, VTU, Bangalore, India. (**I Class**).

### Working Experience Details

- Associate Professor, Department of Mechanical Engineering, BNMIT, Bangalore, India, (21/07/ 2014 to till date).
- Assistant Professor, Department of Mechanical Engineering, PESIT, Bangalore, India, (19/07/2010 to 19/07/2014).

### Subjects taught

**Topics Taught:** Elements of Mechanical Engineering, Basic Thermodynamics, Applied Thermodynamics, Turbo Machines, Energy Engineering, Internal Combustion Engines, Heat and Mass Transfer, Control Engineering.

### Research Experience Details:

#### Ph.D:

- **Title:** CFD Analysis of Flow and Heat Transfer Over Pin Fin Heat Exchanger
  - **Guide:** Dr.C.K.Umesh, Professor, UVCE, Bangalore University
- Cooling of miniature size electronic components has become a challenge for designer in the development of integrated circuits. Micro pin fin heat sink and Micro channel pin fin heat sink are thermal management techniques for effective cooling. The paper presents comparison of fluid flow and heat transfer characteristics for micro pin fin heat sink and micro channel pin fin heat sink with unfinned micro channel heat sink. A three-dimensional heat sink with water as coolant subjected to

constant heat flux 10 W/cm<sup>2</sup>, for Reynolds number ranging between 100 and 900 was considered for the study. Extended surfaces of different shapes namely, square and circular with staggered arrangement was considered for both micro pin fin heat sink and micro channel pin fin heat sink. Two non-dimensional parameters namely Nusselt number and thermal performance index were employed to access the performance of heat sink. Results indicate that the micro channel pin fin heat sink has highest nusselt number and friction factor over the whole Reynolds number range. Results also revealed that formation of secondary vortices enhances heat transfer in micro channel heat sink with square pin fin compared to micro channel heat sink with circular pin fin. However, pin fin heat sink has better thermal performance index compared to Micro channel pin fin heat sink and is more preferable when heat dissipation is compared with pressure drop penalty. The Governing equations for fluid and solid domain were solved using FLUENT to study flow and heat transfer characteristics.

#### **ME:**

- In the present work the numerical simulation is being carried for laminar flow with different Reynolds number for Circular and Square Cylinder. At very low Reynolds numbers, the flow around a cylinder is symmetric and steady. As the Reynolds number is increased, asymmetric vortex shedding occurs. This shedding is periodic, therefore requiring an unsteady time dependent solution. Calculations of unsteady 2D flow around a Circular and Square cylinder are presented. A Von Karman vortex sheet is predicted behind the cylinders with a periodicity, which agrees well with experiments. Detailed Computation have been carried out for variation of wake flow pattern, Instantaneous flow, mean drag and lift co-efficient, recirculation length, Strouhal number, location of separation point with increase in Reynolds number. The entire work is carried out by using commercially available CFD software FLUENT.

#### **Academic Positions and other Responsibilities (Institute Level):**

1. Tatva coordinator, 2018.

#### **Awards/ Achievements/Memberships:**

- Best Paper award titled “Study and optimization of production process of four wheeler exhaust system” in two days national conference on Modern trends in mechanical engineering, Organized by RRCE, May 2017.
- Successfully completed “Introduction to fluid mechanics” course conducted by IIT Kharagpur under NPTEL

#### **Professional Memberships:**

- **Life Member**, Institution of Engineering and Technology (IET).

#### **Research Publications:**

##### **I. In National & International Journals**

##### **International Journals:**

1. **Saravanan.V**, C.K. Umesh, Numerical investigation of thermo hydraulic performance of pin fin heat sink and micro channel pin fin heat sink, Sadhana, Indian Academy of Science, vol. 43, issue 7, **ISSN: 0256-2499, July, 2018.**
2. **Saravanan.V**, C.K. Umesh , DoddamaniHithaish, K.N.Seetharamu, Numerical investigation of pressure drop and heat transfer in pin fin heat sink and micro channel Pin Fin Heat Sink,

International Journal of Heat and Technology, vol.36.no.1,pp.267-276,ISSN: **0392-8764**, **March 2018**.

3. **Saravanan.V**, C.K. Umesh, Experimental investigation for flow and heat transfer over pin fin heat exchanger, IJESRT, volume. 6(12), pp. 511-518, **ISSN: 2277-9655**, **2017**.
4. **Saravanan.V**,C.K. Umesh, Effect of porous medium on Thermo-Hydraulic performance of micro channel heat sink, International Journal of Theoretical and Applied Mechanics, Volume 12, Issue 3, pp. 599-612, **ISSN 0973-6085**, **2017**.
5. **Saravanan.V** , C.K. Umesh , Doddamani Hithaish “Numerical Investigation Of Flow And Heat Transfer In Micro Channel Heat Sink Subjected To Varying Heat Spot” International Journal Of Research In Engineering And Technology, **ISSN: 2321-8843**, Volume: 05 Special Issue: 21,**Nov 2016** .
6. T.R.seetharam,K.N.Seetharamu,G.K.Sharma, **Saravanan.V**,”Laminar forced and mixed convection heat transfer from a plane wall vertical isothermal surface to near-critical carbon dioxide”International journal of Heat and Mass transfer-Vol-59, pp.393-406, **ISSN: 0017-9310**, **2013**.
7. Pavan,Vivek,**Saravanan.V**,Nandesh,K.N.Seetharamu “Numerical analysis of flow past circular cylinder with triangular and rectangular wake splitter”..WASET,Vol 69, **ISSN: 0950-4125**, **2012**.
8. Aniket,Satish,**Saravanan**. “Analysis of flow over a convertible”, Computer aided design and applications,PACE(2),69-75,**2012**.
9. Pavan,Vivek,**Saravanan.V**,K.N.Seetharamu. “Numerical Investigation of heat transfer for flow around circular cylinder with triangular and rectangular wake splitter”WASET,Vol 69-74, **ISSN: 0950-4125**, **2012**
10. **V.saravanan**, C.Damu, R.Karunanithi, S.Jacob, “Finite element analysis and testing of C-Type flexure bearing element”, Indian Journal of Cryogenics, Vol. 36, pp. 66 - 71, **ISSN : 0379-0479**, **December-2011**.

### **Papers presented in International/National Conferences**

#### **International**

1. “**Numerical Investigation and Optimization Of Micro Channel Pin Fin Heat Sink**”  
1st International and 18th ISMEOn Enabling Sustainable Development In Mechanical Engineering, Feb 2017
2. “**Influence of Non Uniform Heating and Porous Medium on Performance of Micro Channel Heat Sink**” An IEEE Technically Co-Sponsored”  
2nd Biennial International Conference On Nascent Technologies In Engineering, Jan 2017.
3. “**Natural Air cooling system for automotives**”  
MSRIT, ICCOMIM-2012

#### **Invited Talks Delivered:**

1. “**Invited Talk on Application of CFD in Micro Channels**” at MSRIT, 1<sup>st</sup> July 2016, Bangalore.
2. “**Invited Talk on Introduction to CFD**” at NDRF, 21<sup>st</sup> January, 2019,Bangalore.

#### **Participation in Training courses/Seminars/Workshops**

1. Participated in FDP on “Research Issues and Challenges in Mechanical Engineering” organized by Department of Mechanical Engineering, BNMIT, Bangalore 16<sup>th</sup> July to 20<sup>th</sup> July-2018.
2. Participated in FDP on “Emerging Research Areas and trends in Mechanical Engineering” organized by Department of Mechanical Engineering, BNMIT, Bangalore 31<sup>st</sup> July to 5<sup>th</sup> August -2017

3. Participated in FDP on “Recent advancement in Mechanical Engineering” organized by Department of Mechanical Engineering, BNMIT, Bangalore 16<sup>th</sup> to 21<sup>st</sup> January -2017
4. Participated in FDP on “Research avenues in Thermal, Design and Manufacturing Engineering” organized by Department of Mechanical Engineering, BNMIT, Bangalore 11<sup>th</sup> to 16<sup>th</sup> July-2016
5. Participated in FDP on “Research avenues in Mechanical Engineering” organized by Department of Mechanical Engineering, UVCE, Bangalore 15<sup>th</sup> to 16<sup>th</sup> ,May-2015.
6. Participated in Training on “Teaching for Engineering Methods and Principles” organized by shruth and smith, March-2014
7. Participated in International symposium on Micro/Nano Scale Heat Transfer, December-2013, held at Department of Mechanical Engineering, PESIT, Bangalore.
8. Participated in FDP on “Wind and Water Tunnel testing”, October-2013, held at Department of Mechanical Engineering, PESIT, Bangalore.
9. Participated in FDP on “Thermal Management of Electronic Equipments”, From March 4<sup>th</sup> to 8<sup>th</sup> 2013, held at Department of Mechanical Engineering, PESIT, Bangalore.

**Personal Details:**

- **Date of Birth:** 26 -03 –1982; **Sex:** Male.

**15<sup>th</sup> February 2019**

**SARAVANAN V.**