

CURRICULUM VITAE OF D. SENTHIL KUMAR

Objective:

To acquire a position that would enhance my knowledge and utilize my skills and experience in the field of heat and fluid flow.

Academic Qualification

- **Ph D** Indian Institute of Technology Roorkee, Uttarakhand, India
2006 – 2010 (Full time)
Title: Study of double diffusive mixed convection problems
- **M. E** (Thermal Power Engineering), Annamalai University, Tamil Nadu
(70.07%) 1995 – 1996 (full time)
- **B. E** (Mechanical Engineering), Annamalai University, Tamil Nadu
(70.6%) 1991 – 1995 (Full time)

Research grant received

- Study of dropwise condensation underneath super hydrophobic surfaces, funded by AICTE of worth INR 12,60,000/-, 2012-2014.
- Study of dynamic behavior of defrosting on super hydrophobic surface, funded by AICTE of worth INR 9,40,000/-, 2017-2020.

Funded workshop organized

- Two week workshop on computational fluid dynamics sponsored by MHRD- ISTE, of worth Rs 2.5 Lakhs, 12-21 June 2012.
- Two week FDP on computational techniques in Mechanical Engineering, sponsored by AICTE of worth Rs.3.5 Lakhs 2018.

Patent

- A method surface texture of copper for the enhancement of dropwise condensation (published)

Ph D Thesis produced

- S. C Solaimuthu, Performance and emission studies in a DI diesel engine with Mahua bio-diesel using SCR and EGR techniques.
- V. Ravikumar, Performance evaluation of thermal barrier coated DI diesel engine fuelled with raphanus sativus.
- R. Vinoth, Study of heat transfer and fluid flow through microchannel heat sink.

Work Experience (20 years)

June 2016 onwards Professor & Head at Sona College of Technology

June 2010 – May 2016 Professor at Sona College of Technology, salem

June 2009– May 2010 Professor and Head, Kamban Engineering college

July 2006 - May 2009 SRF at IIT Roorkee

Feb. 1997– July 2006 Arunai Engineering college, Tiruvannamalai

Research interests

- Experimental study of dropwise condensation on superhydrophobic surfaces
- Mathematical modelling and simulation of dropwise condensation on superhydrophobic surfaces
- Experimental study of pool boiling heat transfer on superphilic surfaces
- Vaporization study of liquid bio-fuel droplet at high temperature and high pressure for spray combustion
- Flow visualization studies
- Finite element techniques to solve heat transfer problems
- Alternative fuels, Emission reduction techniques
- Numerical study of heat and moisture transport through unsaturated porous media
- Numerical study of double diffusive mixed convection problems pertinent to simulation of CVD process, cooling tower and nuclear waste disposal

Subjects Handled

- Thermodynamics
- Heat and mass transfer
- Fluid mechanics
- Computational fluid dynamics
- Thermal Engineering
- I C Engines
- Engineering mechanics
- Total quality management
- Finite element method

Publications

International Journals

1. V.Ravikumar, **D.Senthilkumar**, C.G.Saravanan, V.EdwinGeo, M.Vikneswaran, C.Solaimuthu, J.S.Femilda Josephin, Study on the effect of 2-butoxyethanol as an additive on the combustion flame, performance and emission characteristics of a spark ignition engine, *Fuel*, (2021) vol.285. (accepted) (publisher: *Elsevier*), (SCI)
2. T. Nithyanandam, **D Senthilkumar**, Effect of surface wettability and surface roughness on SiO_2 and copper hybrid thin-film-coated surfaces for nucleate boiling performance, *Heat Transfer Research* (2020) vol.51(15),1363-1381. (publisher: *Begell house*), (SCI)
3. R. Yuvaraj, **D. Senthilkumar**, Study of droplet dynamics and condensation heat transfer on superhydrophobic surface, *Thermal science*, 2020. (SCI)
4. D Vasudevan, **D SenthilKumar**, A Murugesan, C Vijayakumar, Experimental investigation and characteristics of multiwalled carbon nanotube aqua nanofluids from a flat plate heater surface in a pool, *Bulletin of the Polish Academy of Sciences. Technical Sciences*, (2020) vol. 68, 547-554.(SCI)
5. T. Nithyanandam, **D Senthilkumar**, Experimental investigation of critical heat flux on SiO_2 thin film deposited copper substrate in di water at atmospheric pressure, *Thermal science*, Vol. 59(2020), 549-556. (SCI)
6. D Vasudevan, **D Senthilkumar**, S Surendhiran, Performance and Characterization Studies of Reduced Graphene Oxides Aqua Nanofluids for a Pool

- Boiling Surface, International Journal of Thermophysics, 2020 (accepted) (springer), (SCI)
7. R. Yuvaraj, **D. Senthilkumar**, Numerical simulation of thermal wave propagation and collision in thin film using finite element solution, Journal of Thermal Analysis and Calorimetry, 2020 (accepted) (springer), (SCI)
 8. V. Ravikumar, **D. Senthilkumar** Reduction of Smoke and NO_x from the combined effect of thermal barrier coatings and Raphanus Sativus biodiesel in a diesel engine for transport sectors, International Journal of Green Energy (2019) vol.16 1016-1023. (publisher: *Taylor & Francis*), (SCI)
 9. T. Saravanakumar, **D. SenthilKumar**, Performance analysis on heat transfer characteristics of heat SINK with baffles attachment, International Journal of Thermal Sciences, (2019) vol. 142, 14-19. (publisher: *Elsevier*), (SCI)
 10. R. Vinoth, **D. Senthilkumar**, Numerical study of inlet cross section effect on oblique finned microchannel heat sink, Thermal science, 2018 vol. 22, 2747-2757. (SCI)
 11. S. Asokan, **D. Senthilkumar**, Process parameter optimization for multi fuel fired lime mud reburning kiln operation by taguchi method, J-FOR-Journal of science & technology for forest products and processes, 7 (2019) (SCI)
 12. R. Vinoth, **D. Senthilkumar**, Experimental investigation on heat transfer characteristics of an oblique finned microchannel heat sink with different channel cross sections, Heat and mass transfer 54 (2018) 3809- 3817 (springer), (SCI)
 13. Madhavan VM, **Senthilkumar D**, Mahalingam S, Piramanandhan M, Effect of steam injection on Nox emissions and performance of a single cylinder diesel engine fuelled with soy methyl ester, Thermal science, Vol. 21 (2017) 473-479. (SCI)
 14. R. Vinoth, **D. Senthilkumar**, Channel cross section effect on heat transfer performance of oblique finned microchannel heat sink, International communications of heat and mass transfer 87 (2017) 270-276. (publisher: *Elsevier*) (SCI)
 15. V. Ravikumar, **D. Senthilkumar**, C. Solaimuthu, Experimental Investigation of Evaporation Rate and Exhaust Emissions of PSZ-Coated DI Diesel Engine Using Radish Biodiesel and Its Blend with Diesel, International Journal of Ambient energy 38(2016) 202-208. (publisher: *Taylor & Francis*) (SCI)

16. V. Ravikumar, **D. Senthilkumar**, C. Solaimuthu, Experimental Investigation of Evaporation Rate and Exhaust Emissions of PSZ-Coated DI Diesel Engine Using Radish Biodiesel and Its Blend with Diesel, *International Journal of Ambient energy* 38(2016) 202-208. (publisher: *Taylor & Francis*) (SCI)
17. C. Solaimuthu, V. Ragavan, **D. Senthilkumar**, Experimental investigation of evaporation rate and emission studies of madhuca indica biodiesel and its blend with diesel, *International Journal of Green Energy*, vol. 12 (6) (2015), pp. 535-540. (publisher: *Taylor & Francis*) (SCI)
18. C. Solaimuthu, V. Ganesan, **D. Senthilkumar**, Emission reductions studies of a biodiesel engine using EGR and SCR for agriculture operations in developing countries, *International Journal of Applied Energy*, vol 138 (2015), pp. 91-98. (publisher: *Elsevier*) (SCI)
19. V. Ravikumar, **D. Senthilkumar**, Experimental investigation of performance and exhaust emissions of a PSZ-coated diesel fuelled with Radish biodiesel. *Journal of renewable and sustainable energy*. 5, 063121 (2013) (publisher: *AIP*) (SCI)
20. V. Ravikumar, **D. Senthilkumar**, C. Solaimuthu, Experimental investigation of performance and emissions of an Al-20% SiC coated diesel engine with Madhuca Indica biodiesel, *International Journal of Ambient energy*, Vol. 34 (2013), No. 3, 131–137. (publisher: *Taylor & Francis*) (SCI)
21. C. Solaimuthu, **D. Senthilkumar** and V. Ganesan, Effect of static injection timing on the performance and emissions of diesel engine with blends of mahua biodiesel, *International Journal of Mechanical and Materials Engineering (IJMME)*, Vol. 7 (2012), No. 1, 89–95.
22. **D. Senthil kumar**, K. Murugesan, H. R. Thomas, Effect of aspect ratio of a heated block on the interaction between inertial and thermo-solutal buoyancy forces in a lid-driven cavity, *Numerical Heat Transfer - Part A*, 60 (7) (2011) 604-628. (publisher: *Taylor & Francis*) (SCI)
23. **D. Senthil kumar**, K. Murugesan, Akhilesh Gupta, Effect of thermo-solutal stratification on recirculation flow patterns in a backward-facing step channel flow, *International Journal for numerical methods in Fluids*, 64 (2) (2010) 163 – 186. (publisher: *John wiley & sons*) (SCI)

24. **D. Senthil kumar**, K. Murugesan, Akhilesh Gupta, Numerical analysis of interaction between inertial and thermo-solutal buoyancy forces on convective heat transfer in a lid-driven cavity, *ASME Journal of Heat Transfer*, 132(11) (2010) 112501- 1 - 11.(Publisher: *American Society of Mechanical Engineers* [ASME]) (SCI)
25. **D. Senthil kumar**, K. Murugesan, Akhilesh Gupta, Thermosolutal buoyancy induced mixed convection in a backward-facing step channel using velocity-vorticity formulation, *Numerical Heat Transfer - Part A*, 56 (7) (2009) 604–640. (publisher: *Taylor & Francis*) (SCI)
26. **D. Senthil kumar**, K. Murugesan, H. R. Thomas, Numerical Simulation of Double Diffusive Mixed Convection in a Lid-Driven Square Cavity using Velocity-Vorticity Formulation, *Numerical Heat Transfer - Part A*, 54 (9) (2008) 837–865. (publisher: *Taylor & Francis*) (SCI).

National Journal

1. C. Solaimuthu, D. Senthilkumar, K. K. Ramasamy, An experimental investigation of performance, combustion and emission characteristics of Mahua oil methyl ester on four stroke direct injection diesel engine, *Indian journal of engineering and materials sciences*, vol. 20 (2013) pp.42 – 50.
2. R. Yuvaraj, D. Senthilkumar, Heat transfer analysis of dropwise condensation on superhydrophobic copper surface, *Journal of energy, heat and mass transfer*, vol. 37 (2014) pp.119-132.
3. R. Vinodth, D. Senthilkumar, Numerical investigations on oblique finned microchannel for different cross-sections with optimized oblique angle, *Journal of energy, heat and mass transfer*, vol. 36 (2014) pp.227-296.
4. D. Senthil kumar, K. Murugesan, Numerical study of double diffusive buoyancy forces induced natural convection in a square cavity using velocity-vorticity formulation, *Journal of energy, heat and mass transfer*, vol. 38 (2016) pp.115-132.

International Conference

- 1.D. Senthil kumar, P. Leela Krishna, K. Murugesan, Global Matrix-Free Finite Element Algorithm for solution of Velocity-Vorticity form of Navier-Stokes equations: Applications to Flow and Heat transfer studies in a square cavity with

square blockage, Proceedings of 2007 FEF Int. Conference, Santa Fe, New Mexico, USA, March, 26-28, 2007.

- 2.D. Senthil kumar, K. Murugesan, Akhilesh Gupta, Analysis of fluid flow in a lid-driven square cavity with a step blockage using global matrix - free finite element algorithm, Proceedings of Int. Conference on Intelligence systems for Rural development, August 28-30, 2008, AEC Tiruvannamalai, India.
- 3.D. Senthil Kumar, R. Arulraj, K Dinesh Kumar, Numerical Study of Fluid Stratification in Elliptic Pin Fin Heat Sink, Proceedings of Int. Conference on Global Manufacturing Systems & Management, August 1-3, 2011, CIT, Coimbatore, India
- 4.D. Senthil kumar, K. Murugesan, Global matrix - free finite element algorithm – a compact vector storage scheme, Proceedings of Int. Conference on Advances in Modeling, Optimization and Computing (AMOC -2011), December 5-7, 2011, IIT Roorkee, India.
- 5.D.Senthil kumar, R.Yuvaraj, Simulation of Dropwise Condensation on a Superhydrophobic Inclined Substrate, IEEE Explore, Page 217 – 222, International Conference on Energy Efficient Technologies for Sustainability, April 10 – 12, 2013, St.Xavier's Catholic College of Engineering, Nagercoil, Kanyakumari.
6. D.Senthil kumar, R.Yuvaraj, Modeling and Simulation of Dropwise Condensation On Superhydrophobic Surfaces, Proceedings of International Conference on Global Innovation and Technology and Sciences, April 4 – 6, 2013, SAINTGITS College of Engineering, Kottayam, Kerala, India.

National Conference

1. D. Senthil kumar, K. Murugesan, Akhilesh Gupta, Parametric Study on Convective Drying of a Rectangular Brick using Finite Element Method and Mass Lumping Technique, Proceedings of 19th National & 8th ISHMT-ASME Heat and Mass Transfer Conference January 3-5, 2008 JNTU Hyderabad, India.
- 2.D. Senthil kumar, K. Murugesan, Akhilesh Gupta, Numerical analysis of laminar double diffusive mixed convection over a backward facing step using velocity-vorticity form of Navier-Stokes equations, Proceedings of 35th National Conference on Fluid Mechanics and Fluid Power, December 10-12, 2008, PESIT Bangalore, India.

- 3.D. Senthil kumar, K. Murugesan, Akhilesh Gupta, Numerical study of double diffusive natural convection in a rectangular cavity with discrete heat sources using velocity-vorticity equations, 20th National & 9th ISHMT-ASME Heat and Mass Transfer Conference January 4-6, 2010, IIT Bombay, Mumbai.
- 4.D. Vasudevan, D. Senthilkumar, Pool boiling characteristics of reduced graphene oxide nano-fluid over a flat plate heater, 20th National & 2nd international ISHMT-ASTFE Heat and Mass Transfer Conference, December 27-30, 2017, BITS Pilani, Hyderabad.

Personal Profile

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