

CURRICULUM VITAE

DR. BALAJI BAKTHAVATCHALAM

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No. 3/423, Maniyakkarak Street,
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India – 605101.

CAREER OBJECTIVES

- Seeking a challenging position to utilize my skills and abilities in area of Teaching and Research that offers a professional growth while being resourceful, innovative and flexible.

RESEARCH EXPERTISE

- Energy Engineering
- Energy Systems
- Heat Transfer
- Nanomaterials
- Thermofluids
- Thermal comfort
- Energy efficient buildings
- CFD & PV
- Life cycle cost
- Carbon mitigation
- Air conditioning
- Thermoelectrics

EDUCATION

Ph.D. Universiti Teknologi PETRONAS, Nov 2017 – N/A
(Energy, Mechanical Engr.) Malaysia (**#251 in Mechanical Eng.** Jan 2022
QS World Rankings) (4.2 years)

Thesis Title: *Study of Novel Photovoltaic Thermoelectric Air Conditioner with Tralattitious MWCNT Nanofluid for Energy Efficient Buildings*

M. Tech. July 2013 – First
(Energy Technology, Puducherry Technological July 2015 Class
Mechanical Engr.) University, India (Government of (2 Years)
Puducherry)

Thesis Title: *Design and Analysis of a Mixed Salt Salinity Gradient Solar Pond*

B. E. June 2009 – First
(Mechanical Engr.) Anna University, India June 2013 Class
(4 Years)

Thesis Title: *To Run a Petrol Engine Using the Mixture of Turpentine oil & Acetylene Gas*

EXPERIENCE

Assistant Professor, Avvaiyar College of Engineering & Technology for Women, Pondicherry, India; July 2015 – July 2017 (2 years).

Subjects Handled	Laboratory Handled
Engineering Thermodynamics	Heat Transfer Lab
Fluid Mechanics	Wind Turbine
Heat and Mass Transfer	Fluid and Thermal Machines Lab
Applied Hydraulics and Pneumatics	CAD/CAM Lab
Engineering Graphics	Workshop Practice Lab
Engineering Mechanics	

TECHNICAL SKILLS

- Programming: Fortran and MATLAB.
- Software: AutoCAD, Solid works, ANSYS, TRNSYS and ORIGIN.
- Knowledge of CFD analysis using ANSYS Fluent.
- Experience in prototyping and setting up experiments, particularly with regard to temperature, flow and pressure measurements.
- Experimental:
 - Thermogravimetric Analyzer, Differential Scanning Calorimetry, Thermal Analyzer (KD2 Pro & TEMPOS), UV-Vis Spectrometer, FTIR spectroscopy, Scanning Electron Microscopy, Particle Analyzer, Rheometer and Density meter
 - Testo 480 (Indoor air quality, relative humidity, thermal comfort etc.), Davis Vantage Pro (weather forecast, solar radiation, heat index, dew point etc.), Graphtec (data logger)

PROFESSIONAL SKILLS

- Disseminate research findings through academic reporting in form of conference presentation and journal papers publication
- Prepare and presents lectures, tutorials on heat transfer, solid mechanics, fluid mechanics, thermodynamics, dynamics, alternative energy, energy conversion, vibration, plant facilities and transport

- Writing of the report on all ongoing research projects to the project/team leader and the grant sponsoring organization
- Prepare and present the findings on state-of-the-art research in academic seminar, symposium and conference
- Publications in form of Journals, conference papers, book chapter and patent
- Conduct and modify the existing outline for practical class/workshop/seminar on mechanical engineering laboratory which include but not limited to facilities engineering laboratory, fluid mechanics laboratory, alternative energy laboratory, heat transfer and cooling tower laboratory

AWARDS AND HONOURS

- **Awards**
 - Awarded as “BEST POSTGRADUATE STUDENT” in Mechanical Department, Universiti Teknologi PETRONAS, Malaysia for the year 2021.
 - Won the best outstanding presenter award in the 5th International Conference on Mechanical, Manufacturing and Plant Engineering (ICMMPE 2019) held at Kuala Lumpur, Malaysia (Paper ID: 198643).
 - Bronze award in THESIS IN 5 MINUTES with the title “Development and Performance Evaluation of a Novel Nanofluid Assisted Thermoelectric Air Conditioner for Energy Efficient Buildings” in Ph.D. Science, Engineering, Technology, 1st March 2021, MNNF Network, Malaysia.
 - Bronze award in RESEARCH & INNOVATION POSTER COMPETITION with the title “Development and Performance Evaluation of a Novel Nanofluid Assisted Thermoelectric Air Conditioner for Energy Efficient Buildings” in Ph.D. Science, Engineering, Technology, 29th January 2021, MNNF Network, Malaysia.
- **Papers presented**
 - Presented a scientific Paper entitled “MANUFACTURING TECHNOLOGY” in the national conference conducted by IFET college of Engineering & Technology and won **1st prize** held on 4th September 2010.
 - Presented a communication paper entitled “3G Technology” in the National Level Technical Symposium conducted by EXCEL college of Engineering for Women held on 9th September 2010.

- Presented a Scientific Paper entitled “RENEWABLE SOURCES OF ENERGY” in the National Level Technical Symposium conducted by V.R.S college of Engineering & Technology held on 22nd February 2011.
- Presented a scientific paper entitled “RAPID PROTOTYPING” in the National Level Technical Symposium conducted by SRM University and won **1st Prize** in it held on 28th July 2011.
- Presented a technical paper titled “To run a petrol engine using the mixture of turpentine oil and acetylene gas”-in the national conference conducted by IFET college of engineering held on 6th April 2013.

PUBLICATIONS

JOURNALS

- **B. Bakthavatchalam**, K. Habib, R. Saidur, B.B. Saha, Cooling Performance Analysis of Nanofluid Assisted Novel Photovoltaic Thermoelectric Air Conditioner for Energy Efficient Buildings, **Applied Thermal Engineering**. (Elsevier) (IF=5.2) (ISI and Scopus) (Under Review).
- **B. Bakthavatchalam**, K. Habib, R. Saidur, B.B. Saha, Thermal comfort study of a building equipped with nanofluid assisted solar thermoelectric air conditioner, **Energy & Buildings**, (Elsevier) (IF=5.87) (ISI and Scopus) (Under Review).
- **B. Bakthavatchalam**, K. Habib, R. Saidur, B.B. Saha, K. Irshad, Comprehensive study on nanofluid and ionanofluid for heat transfer enhancement: A review on current and future perspective, **Journal of Molecular Liquids** 305 (2020) 112787. (Elsevier) (IF=6.16) (ISI and Scopus)
- **B. Bakthavatchalam**, K. Habib, R. Saidur, N. Aslfattahi, S. M. Yahya, A. Rashedi, Taslima Khanam, Optimization of thermophysical and rheological properties of MXene Ionanofluids for hybrid Solar Photovoltaic/Thermal systems, **Nanomaterials** 11 (2021) 320. (MDPI) (IF = 5.07) (ISI and Scopus)
- **B. Bakthavatchalam**, K. Habib, C.D. Wilfred, R. Saidur, B.B. Saha, Comparative evaluation on the thermal properties and stability of MWCNT nanofluid with conventional surfactants and ionic liquid, **Journal of Thermal Analysis and Calorimetry**, (2020). (Springer) (IF=4.62) (ISI and Scopus)

- **B. Bakthavatchalam**, K. Habib, R. Saidur, S. Shahabuddin, B.B. Saha, Influence of solvents on the enhancement of thermophysical properties and stability of MWCNT nanofluid, **Nanotechnology**. 31 (2020) 235402. (IOP) (IF=3.87) (ISI and Scopus)
- **B. Bakthavatchalam**, N.B. Shaik, P. Bin Hussain, An Artificial Intelligence Approach to Predict the Thermophysical Properties of MWCNT Nanofluids, **Processes**, 8 (2020) 693. (MDPI) (IF=2.84) (ISI and Scopus)
- **B. Bakthavatchalam**, K. Habib, R. Saidur, N. Aslfattahi, A. Rashedi, Investigation of Electrical conductivity, optical property, and stability of 2D MXene nanofluid containing ionic liquids, **Applied Sciences**, 2020, 10(24), 8943. (MDPI) (IF=2.67) (ISI and Scopus)
- **B. Bakthavatchalam**, K. Habib, O.A. Hussein, R. Saidur, K. Irshad, Heat transfer rate optimization of an ionanofluid based heat sink using ANSYS, **International Journal of Automotive and Mechanical Engineering**, 2020, 17(4), 8326. (UMP) (SNIP=0.89) (ESCI and Scopus)
- **B. Bakthavatchalam**, K. Habib, R. Saidur, N.B. Shaik, T.L. Ginta, Analysis of Multiwalled Carbon Nanotubes Porosimetry and Their Thermal Conductivity with Ionic Liquid-Based Solvents, **Journal of Advanced Research in Fluid Mechanics and Thermal Sciences** 77 (2020) 63–75. (Akademia Baru) (SNIP=0.345) (Scopus)
- Hussain P.B., Shaik N.B., Mokhtar A.A.B, **B. Bakthavatchalam**, Ahmad F. and Harun M.S.B, Failure analysis of a broken SA564 stainless steel pump shaft, **International Journal of Materials and Product Technology**, 62 (2021) 152-166. (Inderscience) (IF=0.71) (ISI and Scopus).
- **B. Bakthavatchalam**, K. Rajasekar, K. Habib, R. Saidur, F. Basrawi, Numerical Analysis of Humidification Dehumidification Desalination System, **Evergreen**. 6 (2019) 9–17. (Novel carbon resource sciences) (SNIP=0.711) (Scopus)
- Shaik N.B., Kedar Malik, **B. Bakthavatchalam**, Q. Fatima, Faisal Rehman, Ajit Behera, Dipen Kumar, Catalin Pruncu, Corrosion Behavior of LENS Deposited CoCrMo Alloy Using Bayesian Regularization-Based Artificial Neural Network (BRANN). **J Bio Tribo Corros** 7, 116 (2021). (Springer) (CS=3.6) (ESCI and Scopus).
- H.K. Dawooda; Omar A. Hussein; Ahmed Qays Abdullah; **B. Bakthavatchalam**, Thermal and Rheological Properties of Metallic Oxides Based Nanorefrigerants: Effect of Nanoparticles Type and Shape, **Solid State Technology**, 63 (2020) 4405–4423. (Scopus)

- Rady, M. A., Hussain, P., Shaik, N. B., & **Bakthavatchalam, B.**, Investigation on the physical properties and diffusion layer phase transformation at the interface of Sialon-Duplex Stainless-Steel bonding. **Journal of Mechanical Engineering and Sciences**, 15(3), 8450–8458 (2021). (ESCI and Scopus)
- **B. Bakthavatchalam**, Experimental Investigation On a Mixed Salt Salinity Gradient Solar Pond, **Int. J. Res. Rev. Appl. Sci. Eng.** 8 (2016) 252–261.
- Khairul Habib, Mohammed Ahmed, Ahmed Qays Abdullah, Omer A Alawi, **Balaji Bakthavatchalam**, Omar A Hussein, Metallic Oxides for Innovative Refrigerant Thermo-Physical Properties: Mathematical Models. **Tikrit Journal of Engineering Sciences** 29 (2022) 1-15.

CONFERENCE PROCEEDINGS

- **B. Bakthavatchalam**, K. Habib, R. Saidur, K. Irshad, O.A. Hussein, An investigation of thermal stability and heat capacity of imidazolium based ionic liquids at elevated temperature, IOP Conf. Ser. **Mater. Sci. Eng.** 863 (2020) 012026. (Scopus)
- **B. Bakthavatchalam**, K. Habib, N. Patil, O.A. Hussein, Microstructural analysis of Al6063/sic with calcium additives for hardness enhancement, **MATEC Web Conf.** 225 (2018) 03007. (Scopus)
- O. Hussein, K. Habib, M. Nasif, A. Muhsan, **B. Bakthavatchalam**, Turbulence Combined Convective Heat Transfer and Nanofluids Flows over Double Forward Facing Steps, **MATEC Web Conf.** 225 (2018) 01007. (Scopus)

BOOK CHAPTERS

- **Bakthavatchalam B.**, Habib K. (2021) Thermoelectric Air Conditioners for Tropical Countries. In: Sulaiman S.A. (eds) *Clean Energy Opportunities in Tropical Countries*. Green Energy and Technology. Springer, Singapore. (Scopus)
- **Bakthavatchalam B.**, Habib K., Pugazhandhi B., Keerthana B., Sundarajoo Thulasiraman and Pongiannan R.K. (2021) Stability and thermal Conductivity evaluation of less concentration surfactant wrapped functionalized graphene dispersed in ethylene glycol, *Lecturer Notes in Mechanical Engineering*, Springer. (Scopus)
- **B. Bakthavatchalam** and K. Habib, Transient Thermal Analysis of Imidazolium Based Ionic liquids for Heat Transfer Enhancement, Chapter 13, 2020 ‘*Recent Advances in Energy and Fuel Technology*’, UTP press.

PATENTS

- “Nanofluid assisted thermoelectric air conditioner for efficient space conditioning”, Intellectual Property Corporation of **Malaysia** (MyIPO) “, Filing No.: IP2021006672, 9th November 2021

PROFESSIONAL MEMBERSHIP

- Member of Energy Institute, London, UK (Membership No. 0075469)
- Member of Indian Society of Mechanical Engineers, India (Membership no. 20121226)

RESEARCH GRANTS/PROJECT MANAGEMENT

Title: Heat transfer rate enhancement of an anti-fouling layer coated heat exchanger-based chiller with a novel ionic nanofluid

Awarding agency: Yayasan Universiti Teknologi PETRONAS (YUTP)

Role in project: Graduate Research Assistant

Amount: 46,335 USD

Duration: 01/04/2018 – 01/04/2020

ACADEMIC SERVICE

Reviewed articles for the following Journals:

- Corrosion Engineering Science and Technology (Taylor & Francis)
- Physics Scripta (IOP)
- Thermal Science and Engineering Progress (Elsevier)
- Nanotechnology (IOP)
- Energies (MDPI)

PERSONAL DETAILS

Name: Balaji

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(ctrl+image)



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S/O J. Bakthavatchalam,
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Vanur Taluk, Tamilnadu, India – 605101.

Sex: Male

Marital Status: Single

Date of Birth/Age: 1st October 1991 (30 Years)

Father's Name: Bakthavatchalam J.

Mother's Name: Porkilai @ Vijaya Nirmala

Languages Known: English, Tamil and French

Strengths: Adaptable and friendly, Possess good communication skills, Result oriented, Hardworking and Punctual

Hobbies: Reading, Playing cricket and Travelling

COVID-19 Vaccination Took two doses of *Pfizer* vaccine

REFeree

1. **Dr. Khairul Habib** [My Ph.D. Supervisor]

Department of Mechanical Engineering,
Universiti Teknologi PETRONAS, 32610 Perak, Malaysia.
Tel: +60102442375; Email: khairul.habib@utp.edu.my

2. **Professor Dr. Saidur Rahman** [My Ph.D. Co-Supervisor]

Distinguished Research Professor & Head of Centre,
Research Centre for Nano-Materials and Energy Technology (RCNMET),
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3. **Professor Dr. R. K. Pongiannan** [Former colleague]

Department of Electrical and Electronics Engineering,
Kattankulathur Campus, SRM institute of Science and Technology,
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4. **Professor Bidyut Baran Saha**

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Energy Research, Kyushu University,
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5. **Assoc. Prof. Dr. Omar Assi Hussein**

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Tikrit, Iraq.

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DECLARATION

I hereby declare that the above information is true and correct to the best of my knowledge and nothing has been concealed or distorted.

Date: 01.03.2022

Yours Sincerely,

Place: Pondicherry, India



(Balaji B.)