



Prof. Rajenuram Gopal (Dr.)

Position: Professor

Office: Automotive Engineering

Email: razaautoirtt@bdu.edu.et

Phone: +251941508010

Education:

- ✓ Ph.D., in Mechanical Engineering, at Anna University, Chennai, India
- ✓ M.S., in Thermal Engineering, at Anna University, Chennai, India

Courses:

S.No	Course Name	Level
1.	Vehicle Power Plants (Advanced IC engines)	PG
2.	Alternative Fuels and Specialty Engines	PG & UG
3.	Vehicle Body Engineering	UG, PG and Ph.D
4.	Automotive Structural Design	UG
5.	Vehicle Dynamics	PG & UG
6.	Advanced Vehicle Dynamics	Ph.D
7.	Vehicle Tribology	UG & Ph.D
8.	Automotive Power Train Design	UG
9.	Modern Automotive System Technology	UG
10.	Automotive Chassis	PG
11.	Automotive Transmission Systems	PG
12.	Dynamics of Farm Machine Elements	Ph.D
13.	New Generation and Hybrid Vehicles	Ph.D
14.	Electric and Hybrid Vehicles	Ph.D
15.	Automotive Aerodynamics	Ph.D
16.	Engine pollution and Control	UG and PhD
17.	Engineering Thermodynamics	UG
18.	Engineering Drawing	UG
19.	Design of Machine Elements	UG
20.	Simulation of IC Engine	PG
21.	Tracked Vehicle Dynamics	UG
22.	Combat Vehicle Powertrain Design	UG

Research:

- **Junior Research Fellow** in the project titled, *“Indigenous Resource Utilization: Development of Diesel – Ethanol – Vegetable oil Hybrid fuel Blends and Field testing in Commercial Transport Vehicles”* at Govt. Engineering College, Erode (Institute of Road and Transport Technology), sponsored by Department of Science and Technology, Govt. of India - from 16.06.2008 to 07.07.2010 **(2 Years & 1 months)**
- **Teaching Research Fellow** in the project titled, *“Use of Ethanol as a Substitute Fuel In Transport Buses”* at Govt. Engineering College, Erode (Institute of Road and Transport Technology), sponsored by Tamilnadu State Transport Corporation, Govt. of Tamil Nadu, India- from 02.05.2002 to 15.09.2004 **(2 Years & 4 months)**

Professional Experience:

Research Interests:

- ✓ Alternative Fuels, Electric and Hybrid Vehicles, Fuels, Combustion, Vehicle Dynamics

Honors & Awards:

- ✓ Faculty development program on patent drafting and filing, from 09.02.2022 to 15.02.2022, Jarusalem College of Engineering, Chennai India
- ✓ Flipped Teaching Tools workshop, 10.05.2022 to 03.06.2022, ESSGEE DIGISKILLS, India
- ✓ Seven Days Virtual FDP - "Best Practices for Next Gen Teachers" from the 30th of May, 2022 to the 7th of June, 2022. SRM University India
- ✓ National Intellectual Property Awareness Mission, 09.02.2022 Intellectual Property Office, Govt. of India
- ✓ Organized online seminar on **“The New Normal, Electric and Autonomous Vehicles (Connected and Shared)”**, speaker Mr. R. Sendil Kumar, CAB Geometric Architect, Volvo Group Trucks Technology, Sweden, Defence University College of Engineering, on 27.12.2019.
- ✓ Two days workshop on **“Automotive Embedded Systems”** conducted by Freescale Semiconductor India Pvt., Ltd., Bangalore at Institute of Road and Transport Technology, Erode on 13.08.2012 and 14-08-2012.
- ✓ Five days Workshop on **“Mission 10X”** sponsored by ISTE conducted by Wipro Technologies at Tamilnadu College of Engineering, Coimbatore from 3rd April, 2012 to 4th May, 2012.
- ✓ Two week workshop on **“Heat Transfer”**, sponsored by ISTE, Conducted by Indian Institute of Technology, held at Institute of Road and Transport Technology, Erode from 29-11-2011 to 10-12-2011.
- ✓ Two week Staff Development Programme on **“Emerging Trends in Alternative Fuels and Emission Control Techniques for IC engines”** sponsored by AICTE at Institute of Road and Transport Technology, Erode from 24-11-2010 to 07-12-2010.
- ✓ Two days workshop on **“Emerging Trends in Alternative Fuels and Emission Control Techniques for IC engines”** sponsored by AICTE at Institute of Road and Transport Technology, Erode from 24-11-2010 to 07-12-2010.
- ✓ One day workshop on **“Recent Trends in Air Conditioning”**, sponsored by ISHARE at Institute of Road and Transport Technology, Erode on 1st April, 2010.

- ✓ One day workshop on **“Green Buildings and Energy Conservation Building Code- Challenges and Opportunities”**, sponsored by ISHARE at Institute of Road and Transport Technology, Erode on 11th September, 2009.
- ✓ Two days “Orientation Program for Research Scholars”, at Anna University Coimbatore, 7th and 8th, June, 2008.
- ✓ Staff Development Programme on **“Teaching Methodologies for Imparting Entrepreneurship”** sponsored by AICTE at PSG college of technology, Coimbatore-4, during May 15-27, 2006
- ✓ Two week Faculty Development Programme on **“Engineering Thermodynamics”** sponsored by Centre for Faculty Development, Anna University, Chennai-25 at IRTT, Erode-4, From May 29th to June 10th, 2006
- ✓ AICTE- ISTE Short Term Training Programme (STTP) on **“Advances in Refrigeration and Air Conditioning systems”** at Bannari Amman Institute of Technology, Sathyamangalam-638 401, from March 21th to 27th, 2007
- ✓ One day National Conference on **“Advances in Thermal Engineering”** Coimbatore Institute of Technology, Coimbatore on 31st March, 2006

Publications:

- ✓ Garbe Chukulu Jarso, Ramesh Babu Nallamothe, **Rajendiran Gopal**, Gang Gyoo Jin, “Investigation on steady state performance of hydrodynamic automatic transmission vehicle”, **Energy Conversion and Management: X**, Volume 23, 2024, ISSN 2590-1745, <https://doi.org/10.1016/j.ecmx.2024.100602>.
- ✓ Suthenthiraveerappa, Vimalanand, Ajithkumar S, Venkatachalam Gopalan, Vignesh Pragasam, Aravindh Sampath, Pandivelan Chinnaiyan, Vinoth Kumar Kalidas, Shenbaga Velu Pitchumani, Balamurugan Kulendran, and **Rajendiran Gopal**. “Tensile Properties of Basalt/Jute Fiber Reinforced Epoxy Composite.” **Cogent Engineering** Vol. 11, no. 1 (2024). doi:10.1080/23311916.2024.2348083.
- ✓ Ayeche Shemelash, Bimrew Tamrat, Muluken Temesgen, **Rajendran Gopal**, Belachew Desalegn, Hailemariam Mulugeta, Henok G/yohannes Solomon, “Multi-objective Optimization of a Fibonacci Phyllotaxis Micro Pin-Fin Heat Sink”, **Heat Transfer**, In production. <https://doi.org/10.1002/htj.23083>
- ✓ Tamrat, S., Ancha, V.R., **Rajendran Gopal**, Ramesh Babu Nallamothe & Yared Seifu, “Emission and performance analysis of diesel engine running with CeO₂ nanoparticle additive blended into castor oil biodiesel as a substitute fuel”. **Sci Rep** 14, 7634 (2024). <https://doi.org/10.1038/s41598-024-58420-0>
- ✓ Amanuel Gebisa, Girma Gebresenbet, **Rajendiran Gopal**, Ramesh Babu Nallamothe, An experimental assessment of simultaneous reduction in vehicle tailpipe emissions employing desirability function analysis, **Cleaner Engineering and Technology**, Volume 19, 2024, <https://doi.org/10.1016/j.clet.2024.100731>
- ✓ Mamo, T., **Rajendiran Gopal**. & Yoseph, B. Modeling and Predesign Analysis of Electric Vehicle Considering Ethiopian Driving Cycle. **Int.J Automot. Technol.** (2024). <https://doi.org/10.1007/s12239-024-00045-3>

- ✓ Mamo, T.; Gebresenbet, G.; **Rajendiran Gopal**.; Yoseph, B. “Assessment of an Electric Vehicle Drive Cycle in Relation to Minimised Energy Consumption with Driving Behaviour: The Case of Addis Ababa, Ethiopia, and Its Suburbs”. *World Electr. Veh. J.* 2023, 14, 302. <https://doi.org/10.3390/wevj14110302>
- ✓ Samuel Tamrat, Venkata Ramayya Ancha, **Rajendiran Gopal**, Ramesh Babu Nallamothe, “Study on the effect of dimethyl ether and diesel-castor biodiesel blends on emission and combustion characteristics”, **Fuel Communications**, Vol. 17 (2023) 100098, <https://doi.org/10.1016/j.fueco.2023.100098>.
- ✓ Gopalan Venkatachalam , Umapathy Jayanthi, Arumugasamy Suja, Senthil Gnanaaksaya, Sampath Aravindh , Pitchumani Shenbaga Velu, Kulendran Balamurugan , and **Rajendiran Gopal**, “Virtual Fatigue Behaviour Analysis of Coir Fibre-Reinforced PVC Composites”, **International Journal of Polymer Science**, Volume 2023, Article ID 6685837, <https://doi.org/10.1155/2023/6685837>
- ✓ Amanuel Gebisa, Girma Gebresenbet, **Rajendiran Gopal** and Ramesh Babu Nallamothe, “Assessment on the Impacts of Vehicle Speed and Slope on Tailpipe Emissions Using Desirability Function Analysis”, **Ethiopian Journal of Science and Sustainable Development**, Volume 11 (1), 2024, <https://doi.org/10.20372/ejssdastu.v11.i1.2024.743>
- ✓ Tatek Mamo, **Rajendran Gopal**, Bisrat Yoseph, Samuel Tamirat, Yared seifu, “Numerical Study on Low Speed Electric Car for Public Transportation to Predict its Aerodynamic Performance and Stability”, **Engineering and Technology Journal**, Volume 08 Issue 05 May-2023, Page No.-2183-2190, DOI: 10.47191/etj/v8i5.04, I.F. – 7.136
- ✓ Ebisa Kejela, **Prof. Rajendiran Gopal**, Analytical and Experimental Study of Nano Particles, ISSN: 2799-1156, Vol: 04, No. 01, Dec 2023-Jan 2024, DOI: <https://doi.org/10.55529/jecnam.41.48.66>
- ✓ **G. Rajendiran**, K. Mayilsamy, R. Subramanian, R. Venkatachalam, N. Nedunchezian, “Comparative study on multicylinder DI diesel engine using hybrid fuel blends (diesel-biodiesel-ethanol derivative) as fuel”, **Int. J. of Oil, Gas and Coal Technology** , Vol. 33. No.1, 2023, <https://doi.org/10.1504/IJOGCT.2022.10052915>
- ✓ Amanuel Gebisa, Girma Gebresenbet, **Rajendiran Gopal**, Ramesh Babu Nallamothe, “A Neural Network and Principal Component Analysis Approach to Develop a Real-Time Driving Cycle in an Urban Environment: The Case of Addis Ababa, Ethiopia” **Sustainability**, 14(21), p.13772. <https://doi.org/10.3390/su142113772>
- ✓ Deresse Firew, Ramesh Babu Nallamothe, Getachew Alemayehu, **Rajendiran Gopal**,” Experimental investigation of the effect of three element nano particles on the performance characteristic of Ethanol-Diesel Emulsion”, **Journal of Engineering**, Volume 2022 | Article ID 5778990 | <https://doi.org/10.1155/2022/5778990>
- ✓ Deresse Firew, Ramesh Babu Nallamothe, Getachew Alemayehu, **Rajendiran Gopal**, “Performance and Emission Evaluation of CI Engine fueled with Ethanol Diesel Emulsion using NiZnFe₂O₄ Nanoparticle additive”, **Heliyon**, Vol 8(11), <https://doi.org/10.1016/j.heliyon.2022.e11639>
- ✓ Ganeshkumar S, Venkatesh S, Paranthaman P, Arulmurugan R, Arunprakash J. Manickam m, Venkatesh S, **Rajendiran G**, “ Performance of Multi-layered Nano Coated Cutting Tools in High-

Speed Machining – A Review”, **International Journal of Photoenergy**, vol. 2022, Article ID 5996061, 8 pages, 2022.

<https://doi.org/10.1155/2022/5996061>.

- ✓ Deepak Sampathkumar, SATHISHKUMAR Sessaiah, Mathanbabu Mariappan, Ashokkumar Mohankumar, Guruprasad Balachandran, Murugan Kaliyamoorthy, Barathiraja Rajendran, **Rajendiran Gopal**, “Optimization on Material Removal Rate, Surface Roughness of Stainless Steel 304 Wire cut EDM by Response Surface Methodology” **Advances in Materials Science and Engineering, Volume 2022 | Article ID 6022550 |** <https://doi.org/10.1155/2022/6022550>
- ✓ Pudhupalayam Muthukutti Gopal, Soorya Prakash K, Kavimani V, **Rajendiran Gopal**, “Processing and properties of AlCoCrFeNi High Entropy Alloys - A Review” **Advances in Materials Science and Engineering**, vol. 2022, Article ID 1190161, 13 pages, 2022. <https://doi.org/10.1155/2022/1190161>.
- ✓ Getachew Alemayehu, Deresse Firew, Ramesh Babu Nallamotheu, Amana Wako, **Rajendiran Gopal**, “Operating parameters optimization for lower emissions in diesel engine with PCCI-DI mode using Taguchi and grey relational analysis”, **Heliyon**, Volume 8, Issue 6, 2022, <https://doi.org/10.1016/j.heliyon.2022.e09679>
- ✓ Getachew Alemayehu, Ramesh Babu Nallamotheu , Deresse Firew and **Rajendiran Gopal**, “Experimental Investigation on Impact of EGR Configuration on Exhaust Emissions in Optimized PCCI-DI Diesel Engine” **Journal of Engineering**, Volume 2022. <https://doi.org/10.1155/2022/5688842>
- ✓ Biru Berhanu, **Rajendiran Gopal**, “Investigation of Performance and Emission Characteristics of Diesel-Ethanol PCCI Engine”, **International Journal of Research in Science & Engineering**, Vol. 02, No. 01.
- ✓ Gebisa, Amanuel, Girma Gebresenbet, **Rajendiran Gopal**, and Ramesh B. Nallamotheu (2021). "Driving Cycles for Estimating Vehicle Emission Levels and Energy Consumption" *Future Transportation* 1, no. 3: 615-638. <https://doi.org/10.3390/futuretransp1030033>
- ✓ C. Jegadheesan, Ajit Pal Singh, **G. Rajendiran**, K. Manikandan (2015), “Combustion analysis of CI engine fuelled by pongamia pinnata biodiesel using hydrogen and diethyl ether as secondary fuel”, **Energy Education Science and Technology Part C: Future Energy Sources**, Volume 7(2), pp 73-82
- ✓ Rajendiran Gopal, Mayilsamy Kavandappa Goundar, Subramanian Ramasamy, Nedunchezhian Natarajan (2013), Venkatachalam Ramasamy , Experimental and regression analysis for multi cylinder diesel engine operated with hybrid fuel blends”, **International Journal of Thermal Science**, Vol. 18(1), pp. 193 - 203.
- ✓ **G. Rajendiran**, R. Subramanian, R. Venkatachalam, N. Nedunchezhian & K. Mayilsamy (2013), “Experimental investigation on combustion analysis of multicylinder direct injected diesel engine using diesel–biodiesel–DEE as alternative fuel, **International Journal of Ambient Energy**, Vol. 34 (2). Pp. 63-72.

- ✓ R.Subramanian, **G.Rajendiran**, R.Venkatachalam, N.Nedunchezian and K.Mayilsamy, “Experimental Investigations on Performance, Emission and Combustion analysis of Diesel-Ethanol-Vegetable oil in a Multi cylinder diesel engine”, **SAE 2011-26-0009**.
- ✓ R.Subramanian, **G.Rajendiran**, R.Venkatachalam, N.Nedunchezian and K.Mayilsamy, “Hybrid Fuel blends- The Alternative Fuel for Transport Bus Engine”, **SAE 2009-18-0032**
- ✓ R.Subramanian, **G.Rajendiran**, R.Venkatachalam, N.Nedunchezian and K.Mayilsamy, (2011), “Studies on performance and emission characteristics of multicylinder diesel engine using hybrid fuel blends as fuel”, **Journal of scientific and Industrial research**, Vol. 70, pp. 539-543.
- ✓ P.Ponnusamy, **G.Rajendiran**, R.Subramanian and N.Nedunchezian, (2011), “Experimental Investigation of Catalytic Surface Reaction for Different Metal Surfaces”, **Innovative Systems Design and Engineering**, Vol 2, No 5, pp.82-92
- ✓ S.Tharves Mohideen, **G.Rajendiran**, P.Kumar Babu and S.R.Devadasan (2006), Simulation Studies on performance of Auto-cascade Refrigeration system using Ecofriendly refrigerants”, **National Journal of Technology**, Vol. 2, No. 4, pp. 8-11.
- ✓ S.Tharves Mohideen **G. Rajendiran** P.Kumar Babu S. R. Devadasan (2009) “Studies on Techno Economic Viability of Hybrid Compression-Absorption Refrigeration System”, **Indian Journal of Engineering Science and Technology**, Vol.3(1), pp.09-15

Conference:

- ✓ _____
- ✓ **Dr.Rajendiran Gopal**, Dr.K. Mayilsamy, Dr.R. Subramanian, Dr.R. Venkatachalam, Dr.N. Nedunchezian, Advancing Injection Timing for Enhanced Performance and Reduced Emissions in DI Diesel Engines Using Diesel-Biodiesel-Ethanol Blends, 12th EAI International Conference on Advancements of Science and Technology- ICAST 2024: November 1-3, 2024, Bahir Dar Institute of Technology, Bahir Dar, Ethiopia
- ✓ **Dr.Rajendiran Gopal**, Dr. N. Nedunchezian , Dr. R. Subramanian, Effect of injection timing on the Performance of multicylinder DI diesel engine using hybrid fuel blends (diesel-biodiesel-ethanol) as fuel, The 3rd international conference on building a sustainable future with recent trends in science and technology, 2024
- ✓ G.Rajendiran and R. Venkatachalam, “Experimental Investigation on Diesel Engine Using Ethanol and Its Derivative (DEE) as Fuel”, Proceeding of the 5th International Conference on the Advancement of Science and Technology (ICAST-2017), held at Bahir Dar Institute of Technology, Bahir Dar University on May 19 and 20, 2017
- ✓ C. Jegadheesan, P. Somasundaram, G. Rajendiran and James K. Varkey (2015), “Effect of Hydrogen Addition on the Performance of Pongamia Pinnata Biodiesel Fuelled Compression Ignition Engine”, Proceedings of the National Conference on Emerging Technologies’ Contributions in Promoting Defense and Industry Capabilities, pp. 45-51.
- ✓ R.Subramanian, R.Venkatachalam, K.Mayilsamy and **G.Rajendiran**, “Investigations on performance and emission characteristics of multi-cylinder diesel engine operated with hybrid fuel blends”, International Conference on Recent Trends in Materials and Mechanical Engineering, ICMME-2008 held in Dr.Mahalingam College of Engineering and Technology, 18-20 December 2008
- ✓ **G.Rajendiran** S.Tharvesmohideen, “Simulation studies on Half Effect Ammonia Vapour Absorption Cooling system using engine cooling water” proceedings of National conference on Applications of Advanced Quality Methods in Engineering and

Technology(AAQMENT-2006), Erode Sengunthur Engineering college, Erode, 23rd and 24th November, 2006.

- ✓ Babu PK, Poduval AM, Mohideen ST, **Rajendiran G.** Studies on technoeconomic viability of cascade compression–absorption hybrid refrigeration system for dairy industries. In National conference on refrigeration and air conditioning, NCRAC 2009 (pp. 08-10).
- ✓ N.Nedunchezian R.Subramanian, **G.Rajendiran**, B. Sevvel and R.Vadivel “Ethanol as Bi-fuel In Transport Buses” ISTE sponsored National conference on Alternate Fuel for Automobiles at Institute of Road and Transport Technology, Erode on 05th , March, 2004

Projects:

- ✓ Investigation on Tribological Properties of Castor Oilzinc Blends with for Enhanced Lubricant Performance, **2023-2024**
- ✓ Design and Development of Emergency Brake System for Toyota Land Cruiser (HZJ79) Pickup Manual Transmission Vehicles, **2021-2022**
- ✓ Experimental investigation of the effect of ethanol blend ratio on the performance and emission characteristics of diesel engine fuelled by biodiesel-diesel fuel blend, **2021-2022**
- ✓ Numerical and Experimental Investigation on Direct Injection Compression Ignition Dual-Fuel Engine by Ethanol-Port Injection, **2020-21**
- ✓ Analytical and experimental study of Nanoparticles effect in engine cooling system, **2020-21**
- ✓ Modeling and Simulation of Powertrain for Light Duty Hybrid Electric Vehicle, **2020-21**
- ✓ Simulation and Analysis of Variable Vehicle Speed Limiter, **2019-20**
- ✓ Design and analysis of new model three wheeled vehicle’s Chassis and body frame assembled, **2018-19**
- ✓ Modeling and control of vehicle hydraulic retarder using fuzzy logic, **2018-19**
- ✓ Experimental Study of Direct Injection Diesel Engine Using Biogas-Diesel by Dual Fuel Mode, **2017-18.**
- ✓ Production of Biodiesel from Animal fat and Utilization in Diesel Engine, **2016-17.**
- ✓ Design and Analysis of axle for three ton capacity Of Tractor Trolley manufactured in AAMI – in **2015- 16**
- ✓ Croton seed biodiesel in diesel engine: production, optimization, performance and emission analysis- in **2015- 16**
- ✓ Design and analysis of 12m city bus chassis frame for the manufacturing facility of chassis in Bishoftu automotive industry using ANSYS workbench- in **2015- 16**