




Dr Srijit Biswas

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Agartala, Tripura, India 

English; हिन्दी; বাংলা; 

<https://sites.google.com/view/iamsrijit91/> 




 CSIR Pool Scientist |  LCA TEA Expert; ICE Testing; Statistical Modelling Specialist | CIF: 86.8 | Worked on sustainability of CBG, CNG, HEVs vs. BEVs; Combustion of Biofuels, H₂, CNG, LPG |  PhD in Mech. Eng. |

Worked on Projects

International
National

	02	Total Articles:	28
SCIE:	02		14
Book Chapter:	00		01
Scopus:			05
Conferences:			08

 **02 Year, 01 Month:** Professional Experience

 **07 Year, 06 Month:** Research Experience



IIT Kanpur

(1.8 Year)

(Oct, 2022 to Present)



Senior Research Associate under the Scientists' Pool Scheme (CSIR) at the Engine Research Laboratory of the Mechanical Engineering Department, IIT Kanpur.

- ❖ Working on UAV Engine Design and Development
- ❖ Working on the Project titled "Feasibility testing of the alcohol-diesel blends on existing production grade CI engine".
- ❖ Worked on a Project titled "LCA and TCO Assessment for CBG,CNG and Gasoline Fuelled ICEVs vis-a-vis BEVs"



Project Scientist at Engine Research Laboratory of Mechanical Engineering Department, IIT Kanpur

- ❖ Worked on the Project titled "Life Cycle Assessment (LCA) and Total Cost of Ownership (TCO) of HEV, BEV and ICEV in India"



Chandigarh University

(0.5 Year)

(Mar, 2022 to Sep, 2022)

Assistant Professor at University Center for Research and Development, Chandigarh University.



NIT Agartala

(7 Year)

(Jan, 2017 to Nov, 2023)

PhD Scholar in Mechanical Engineering Department, NIT Agartala.

- ❖ Worked on Applied IC Engine with alternative biofuels, CNG and Hydrogen.

Technical Skill Set:

Software : Fusion360; Creo, SOLIDWORKS, ANSYS;

Tool : SimaPro, GREET, Design Expert, JMP Pro, Mind Mapper Arena, Minitab, Origin, MATLAB, MS Office etc.

Area of Interest:

- Life Cycle Assessment, Techno-Economic Assessment;
- IC Engine; Combustion; Stability; Performance; Emission, Engine Design.
- Alternative Fuels (Biodiesel, H₂, CNG, LPG, CH₃OH, C₂H₅OH, C₄H₉OH);
- Applications of Different Optimization Techniques. (DoE, RSM)
- Design & Analysis (CFD);



Hobbies



Education

PhD in ME
(Mechanical Engineering)

M Tech in CIM

(Computer Integrated Manufacturing)

[8.48/10]

B Tech in PE

(Production Engineering)

[7.05/10]

Achievements & Honors

Visiting Researcher at CZU Prague, IIT Roorkee

Certificate of Appreciation from ISEES

Reviewer at Elsevier, Springer

Associate Member at IEI (AM173993)

Session Topper in National Level Conference



NIT Agartala

Research Activities

IF

Journals (SCIE)

14 (Fourteen)

1. Chakraborty A; **Biswas S***; Meitei S; Sengupta A; Kakati D, Banerjee R “Examining the significance of the ignition characteristics of hydrogen and liquefied-petroleum-gas on the reactivity-controlled compression ignition and its interspersed profiles induced in an existing diesel engine: A comparative perspective” **Energy Conversion and Management**, 2022 10.4
2. Kakati D*, **Biswas S**, Banerjee R “Artificial intelligence assisted MOPSO strategy for discerning the exergy efficiency potential of a methanol induced RCCI endeavour through GA coupled multi-attribute decision making approach” **Energy Conversion and Management**, 2021 10.4
3. **Biswas S***, Kakati D, Chakraborti P, Banerjee R “Performance-emission-stability mapping of CI engine in RCCI-PCCI modes under varying ethanol and CNG induced reactivity profiles: A comparative study through experimental and optimization perspectives” **Energy**, 2022. 9
4. Chakraborty A, **Biswas S***, Kakati D, Chakraborti P, Banerjee R “Leveraging hydrogen as the low reactive component in the optimization of the PPCI-RCCI transition regimes in an existing diesel engine under varying injection phasing and reactivity stratification strategies” **Energy**, 2022 9
5. Kakati D*, **Biswas S**, Banerjee R “Parametric sensitivity analysis of split injection coupled varying methanol induced reactivity strategies on the exergy efficiency enhancement and emission reductions objectives in a biodiesel fuelled CI engine” **Energy**, 2021 9
6. **Biswas S***, Kakati D, Chakraborti P, Banerjee R “Assessing the potential of ethanol in the transition of biodiesel combustion to RCCI regimes under varying injection phasing strategies: A performance-emission-stability and tribological perspective” **Fuel**, 2021 7.4
7. **Biswas S***, Sengupta A, Kakati. D, Banerjee R Chakraborti P “Parametric-Optimization of the CNG and Ethanol induced RCCI profiles in biodiesel combustion through a robust design space foray” **Fuel**, 2022 7.4
8. **Biswas S**, Banerjee R*, “In-Cylinder Pressure profiling for CNG/Ethanol Enriched Biodiesel Combustion” **Fuel**, 2023 7.4
9. **Biswas S***, Sengupta A, Kakati D, Banerjee R “The Transition from Conventional Biodiesel Combustion to RCCI with CNG/Ethanol Induction in CI Engine: A Comparative Combustion Analysis and their Effect on Performance-Emission-Stability” **International Journal of Engine Research**, 2022 2.5
10. **Biswas S***, Kakati D, Chakraborti P, Banerjee R “Characterization of CNG induced transition regimes of reactivity-controlled-combustion of *Madhuca Longifolia* biodiesel: An experimental case study” **Energy Sources, Part A: Recovery, Utilization, and Environmental Effects**, 2021 2.9
11. **Biswas S***, Kakati D, Roy S, Chakraborti P, Banerjee R “Exploring the Synergistic Potential of Response Surface Methodology Based Multi-Objective Optimization in the Performance–Emission-Stability Trade-off Envelope of an Existing Diesel Engine” **Energy Sources, Part A: Recovery, Utilization, and Environmental Effects**, 2020. 2.9
12. Sengupta A, **Biswas S***, Banerjee R, “Performance-emission effect of n-butanol in Reactivity Controlled Compression Ignition regimes of biodiesel combustion” **Energy Sources, Part A: Recovery, Utilization, and Environmental Effects**, 2023 2.9
13. Biswas N, **Biswas S**, Bhattacharjee B* , Mandal S K, Choudhuri K, Chakraborti P, “Prediction and optimization of a hydrodynamic journal bearing’s energy efficient tribological behaviors for different grades of lube oil: A novel DoE-RSM strategy”, **Arabian Journal for Science and Engineering**, 2024 2.9

14. Das J, Mondal A, **Biswas S**, Nag S*, "The eco-friendly treatment of rubber industry effluent by using adsorbent derived from *Moringa oleifera* bark and *Pseudomonas* sp, cultured from effluent", **Water Science & Technology**, 2022 2.7

Total

86.8

Scopus:

5 (Five)

1. Choudhuri K, Biswas N, Mandal S K*, Mitra C, **Biswas S** "A numerical study of an external gear pump operating under different conditions" Published in **Materials Today: Proceedings** from the Conference: **International Conference on Sustainable Nanotechnology and Nanomaterials**
2. Bhowmik A, Saha S, Kumar M S, Dey D, **Biswas S**, "Non-lubricated dry sliding wear activities of Al7075/Fly ash nanocomposites by exploring grey based Taguchi optimization" Published in **Materials Today: Proceedings** from the Conference: **International Conference on Sustainable Nanotechnology and Nanomaterials**
3. Islam M, Bhowmik A, Haidar S, **Biswas S**, "Machining performance of Nano SiC and graphite powder mixed aluminum matrix composites fabricated by powder metallurgy using EDM" Published in **Materials Today: Proceedings** from the Conference: **International Conference on Sustainable Nanotechnology and Nanomaterials**
4. Biswas N, Chakraborti P, Saha A, **Biswas S**, "Performance & stability analysis of a three lobe journal bearing with varying parameters: Experiments and analysis" Published in **AIP Conf. Proc** from the Conference: **International Conference on Mechanical Engineering**
5. Bhowmik A, Meher A, **Biswas S**, Dey D, Saravana MK, Biswas A, Alsharabi R M*, "Synthesis and Characterization of Borosilicate Glass Powder-Reinforced Novel Lightweight Aluminum Matrix Composites" **Advances in Materials Science and Engineering**, 2022

Conferences:

8 (Eight)

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| <ol style="list-style-type: none"> 1. Dutta P*, Biswas N, Chakraborty S, Biswas S, "Oil Well Rig and Directional Drilling Technology: A Field Investigation" International Conference on Emerging Trends in Science Technology Engineering and Management | International |
| <ol style="list-style-type: none"> 2. Biswas S*, Kakati D, Chakraborti P, Banerjee R "Exploring The NOX-Soot Emission Trade-Off of a Single Cylinder CRDI Coupled Diesel Engine with CNG-Diesel Dual Fuel Strategies: A DoE Based RSM Optimization Approach" Published in International Journal of Mechanical and Production Engineering Research and Development (IJMPERD) from the Conference: Futuristic Trends in Materials, Manufacturing, and Mechanical Engineering (FTMMME-2020) | National |
| <ol style="list-style-type: none"> 3. Kakati D*, Biswas S, Roy S, Banerjee R "An Investigation of the Optimal Fuel Injection Strategy in an Existing Diesel Engine- A CFD Coupled RSM Optimization" Published in International Journal of Mechanical and Production Engineering Research and Development (IJMPERD) from the Conference: Futuristic Trends in Materials, Manufacturing, and Mechanical Engineering (FTMMME-2020) | National |
| <ol style="list-style-type: none"> 4. Chakraborty S*, Biswas N, Bhattacharjee P, Biswas S "Experimental Investigation of MRR & Surface Roughness in CNC End Milling Process for Aluminium" National Level Conference on Engineering Problems and Application of mathematics | National |
| <ol style="list-style-type: none"> 5. Choudhuri K*, Equbal A, Biswas N, Pati A, Mandal SK, Biswas S, "CFD Analysis of water-based slipper bearing" Published in IOP Conference Series: Earth and Environmental Science from the Conference: International Conference on Advanced Earth Sciences & Foundation Engineering (ICASF-2022) | International |

Conferences (Cont.)

- 6 Agarwal A K*, **Biswas S**, “Global Warming Potential of Cow Dung-Based Compressed Biogas” accepted for Oral presentation at **VIII SEEC conference**. International
- 7 Agarwal A K*, **Biswas S**, Bhatnagar M, “Total Cost of Ownership Analyses of Battery Electric Powertrains and Internal Combustion Engine Powertrains fuelled with Natural Gas” accepted for Oral presentation at **VIII SEEC conference**. International
- 8 Valera H, Chauhan S S, **Biswas S**, Agarwal A K*, Čedík J, Pexa M, Müller M, Šleger V, “Parametric Evaluation to Establish the Potential of Stable Methanol-Diesel Blends for Heavy-Duty Non-Road CI Engines Using 1-Dodecanol and Iso-Butanol as A Co-Solvent” accepted for Oral presentation at **VIII SEEC conference**. International

Book Chapter:

01 (One)

1. *Kakati D*, **Biswas S**, Banerjee R “A Novel DoE Perspective for Robust Multi-objective Optimization in the Performance-Emission-Stability Response Realms of Methanol Induced RCCI Profiles of an Existing Diesel Engine” **Greener and Scalable E-fuels for Decarbonization of Transport, 2021***

PROJECTS

Post-Doc Project: (2023-24)

“LCA and TCO Assessment for CBG, CNG and Gasoline Fuelled ICEVs vis-a-vis BEVs” funded by NEDO, Japan

The main objective of this project was to identify the net greenhouse gas (GHG) and other emissions and the global warming potential (GWP) of net emissions, along with the economic feasibility of different vehicle powertrain technology options, by conducting a Lifecycle Assessment (LCA) and Total Cost of Ownership (TCO) analysis of two sets of four-wheeler (4W) vehicles, powered by compressed natural gas (CNG), compressed biogas (CBG) from cow dung, and gasoline-fuelled ICEVs and BEVs.

Post-Doc Project: (2022-23)

“LCA and TCO Analysis of BEVs, and HEVs vs ICEVs” funded by NEDO, Japan

The main objective of this project was to identify the net greenhouse gas (GHG) emissions and the global warming potential (GWP) of net emissions, along with the economic feasibility of different vehicle powertrain technology options, by conducting a Lifecycle Assessment (LCA) and Total Cost of Ownership (TCO) analysis of two sets of four-wheeler (4W) vehicles, powered by gasoline-fuelled ICEVs and HEVs vis-a-vis BEVs

PhD Project: (2017-2021)

“A comparative assessment of the optimality potential of alcohol and CNG as the low reactive component in the RCCI transition regimes of biodiesel combustion: Performance-emission-stability and tribological perspectives” at MED, NIT Agartala

India is the world's fastest rising economic superpower. Technological advancement necessitates more efficient, sustainable, and reliable energy sources that can outperform the transportation and power generation sectors' reliance on largely imported fossil diesel and may have the potential to reduce emissions in order to achieve "Net zero carbon footprints" by 2070.

This PhD project's primary objective is as follows:

- Primary research of a conventional diesel engine to comprehend and enhance its performance and emission characteristics with next generation injection schemes such as split injection and EGR application, followed by multi-objective optimization using DoE-RSM training and learning.
- Understanding the behaviour of a conventional diesel engine by introducing a low reactive fuel such as CNG as a secondary fuel coupled with fossil diesel and then using DoE-RSM to generate a robust numerical model.
- The application of alternative fuels that outperform the benefits of fossil diesel in terms of performance, emissions, and economics, with the implementation of novel injection and reactivity phasing tactics.
- A comparison of the combustion characteristics of various alternative fuel-based engines operating at various injection and reactivity phasing levels, followed by a multi-factor at a time-based multi-objective optimization to achieve compromise solutions for simultaneously improving the engine's performance, emission, and stability.
- A tribological examination of the engine is related to the matters in order to determine its durability while running on different types of unconventional fuel.

M. Tech Project: (2014-2016)

“Analytical and Experimental Investigation on Circular Hydrodynamic Journal Bearing Considering Different Varying Parameters” at PED, NIT Agartala

- Used FTOPSIS and FCOPRAS to find the best material for journal bearing according to the literature review.
- Modeling and analysis of plain hydrodynamic journal bearing by Creo, Solidworks and Ansys Software.
- Compare the experimental result developed from journal bearing Test Rig 60, with the analytical work.
- Different optimization technique has been used to find the optimum result.

B. Tech Projects: (2014)

- a) Modelling, Simulation and a Comparative Study of NACA 0012 Airfoil Using Fluent and X-Foil.
 - Analyzed the NACA 0012 airfoil in fluent under the turbulence model and then in x-Foil.
 - Developed a model of the airfoil for wind tunnel testing in the AF100 subsonic wind tunnel and compared the results.
- b) Baja, SAEIndia 2013
 - Designed, created and fabricated an off-road vehicle capable of navigating the harshest terrain and obstacles as part of a 25-member team.
- c) Vizag Steel Plant.
 - One-month training program has been attempted at the Vizag Steel plant to understand the real-life problems and working culture of the industries.
- d) Niladri Motors.
 - Brief description about the small cars of TATA and FIAT (Transmission and Engine)

DECLARATION

I, the undersigned, solemnly declare that all information furnished above is true and actual to the best of my knowledge and belief.

Date: 08-05-2024



Dr Srijit Biswas