

Tawsif Rahman (Ph.D.)

Postdoctoral Fellow

College of Forestry, Wildlife and Environment, Auburn University
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Google Scholar: <https://scholar.google.com/citations?user=tk4LYQ4AAAAJ&hl=en>

Summary

Experienced researcher with expertise in waste treatment, petrochemical (Oil & Gas), and biomaterial synthesis fields, backed by a Ph.D. degree in Biosystems Engineering. Proficient in managing international research projects related to biomass, plastic liquefaction, waste management, and greenhouse gas reduction. Additionally, experienced in academic teaching and mentoring students.

Education

Auburn University | Alabama, USA

Aug 2018 - Dec 2022

Doctor of Philosophy (Ph.D.) Biosystems Engineering

GPA: 3.59/4.00

University of Science and Technology (UST) | Daejeon, Republic of Korea

Mar 2015 - Feb 2017

Master of Engineering (M.Eng.) Environment & Energy Mechanical Engineering

GPA: 4.28/4.5

Bangladesh University of Professionals (BUP) | Dhaka, Bangladesh

Feb 2008 - Jan 2012

Bachelor of Science (B.Sc.) Mechanical Engineering

GPA: 3.65/4.00

Core Skills

Research Area: Renewable Energy, Green Chemistry, Agricultural system analysis, Environmental engineering, Environmental resource management, Environmental Protection, Biorefinery: biomass and natural resources valorization by biofuel, biochar & biomaterial synthesis, Solid waste treatment, Plastic upcycling, Water quality-water conservation, Wastewater treatment, Soil health.

Research Skills: Applied Research, Experimental Design, Data collection and storage, analyzing data, Strategic approach, Strategic Vision, Planning and organizing projects: time management, managing data and resources, planning new scientific projects or developing new research directions by learning other fields.

Technical Background: Applied Engineering- Mechanical, Chemical, Environmental, Production, Biosystems; Thermochemical conversion techniques - Hydrothermal Liquefaction, Pyrolysis; Downstream processing – Hydrodeoxygenation/Hydrotreatment, Fractionation; Separation techniques - liquid-liquid extraction; Biomass pre-treatment; Aging Test of Biofuel.

Proficient reactor systems: Pyrolysis reactor - Tilted slide fluidized bed system, rotary kiln, fixed bed reactor; High pressure autoclave reactors – batch reactors (100 -1800ml), continuous hydrothermal liquefaction reactor (1500 ml).

Expertise with materials: Liquefaction feedstock: Biomass - lignocellulosic, energy crop, algae, palm oil residue (palm kernel shell), agricultural residue; Food waste - coffee residue, kitchen waste; Municipal waste - sewage sludge,

plastic waste; Catalyst synthesis: Industrial waste- red mud, gypsum, Transition metal - nickel (Ni), cobalt (Co), molybdenum (Mo), magnesium (Mg), Catalyst Support -red mud, zirconia (ZrO₂), ZSM-5, and biochar; Biomaterial Synthesis: preparation of bio-based phenol-resorcinol-formaldehyde (PRF) resin; Synthesis of bioplastic films via solvent casting procedures from polylactic acid (PLA), cellulose acetate.

Documentation skills: Excellent writing skills in scholarly research articles, literature review, scientific report, and research grant proposal.

Teaching Skill: Lesson planning, Youth development, Mentoring, Classroom management, public speaking, technical assistance in experimental class

Laboratory Techniques: Scanning electron microscopy (SEM), Energy dispersive X-ray spectroscopy (EDS), Inductively Coupled Plasma Optical Emission spectroscopy (ICP-OES), Nuclear Magnetic Resonance (NMR), Gas Chromatography–Mass Spectrometry (GC-MS), Sim Distillation, Rotary Evaporation, Ultimate analysis, Proximate analysis, Fourier Transform Infrared (FTIR) spectroscopic analysis, Karl-Fischer Titration, Thermogravimetric Analysis (TGA), Differential scanning calorimetry(DSC), Bomb Calorimeter, Viscometer, Total organic carbon(TOC), Total nitrogen (TN), and Chemical Oxygen Demand (COD), operation of Masuko's super mass colloid series of friction grinding machine.

Software: Microsoft Office; Statistical Analysis: R, SAS; Modeling & Simulation: SuperPro, Ansys.

Other Skills: Cooperative teamwork, Interpersonal communication skills, Identify Challenges and subsequent steps, Laboratory management, Chemical Inventory Management, purchase order management, waste management, cross functional coordination, compliance management, management, continuous improvement, chemical manufacturing, chemical engineering, root cause analysis, technical guidance, hazard assessments, safety review, team training.

Work Experience

Postdoctoral Fellow

Jan 2025 - Present

College of Forestry, Wildlife and Environment, Auburn University | Auburn, Alabama, USA

Responsibilities: Maintaining collaboration between research groups, developing standard methods for biomaterial performance testing, mentoring graduate students, assisting in teaching courses, and overseeing laboratory maintenance.

Postdoctoral Fellow

Feb 2023 - Dec 2024

Department of Biosystems Engineering, Auburn University | Auburn, Alabama, USA

Responsibilities: Laboratory management-maintenance; mentoring students; maintaining collaboration with different research groups; assisting research proposal writing, serving as guest lecturer in academic courses, preparing scientific articles, and presenting research at academic conferences.

Research Associate

Jan 2025-Feb 2025

Department of Biosystems Engineering, Auburn University | Auburn, Alabama, USA

Responsibilities: Conducting experimental research, data analysis, maintaining research collaboration, and preparing scholarly articles.

Graduate Research Assistant

Aug 2018 - Dec 2022

Department of Biosystems Engineering, Auburn University | Auburn, Alabama, USA

Responsibilities: Performing experiments with diverse organic feedstocks in high-pressure autoclave batch reactors, conducting chemical analysis of the product, assisting other graduate students in research and scholarly article writing, operating and troubleshooting laboratory instruments, and presenting research in academic conferences.

Intern

Apr 2017 - Mar 2018

Eco-friendly Energy & Environment Research Division, Korea Institute of Machinery & Materials | Daejeon, Republic of Korea

Responsibilities: Operating the bubbling fluidized bed pyrolysis reactor, liquefaction product analysis, and data analysis.

Research Assistant / Trainee

Mar 2015 - Feb 2017

Korea Institute of Machinery and Materials, University of Science and Technology | Daejeon, Republic of Korea

Responsibilities: Participating in pilot-scale pyrolysis unit operation, learning and applying pyrolysis technology for diverse feedstock liquefaction, preparing master's thesis on liquefaction of palm industrial waste, and participating in Korean government-funded projects by characterizing municipal solid waste materials from commercial entities for quality measurement.

Lecturer

Sep 2012 - Dec 2014

Textile Engineering Department, The People's University of Bangladesh | Dhaka, Bangladesh

Responsibilities: Preparing lessons for a class of 30-50 students, curriculum implementation, teaching undergraduate-level engineering courses, grading assignments, preparing exam questions, and grading exam scripts.

Industrial Trainee

Nov 2010 - Dec 2010

Eastern Refinery Limited | Chattogram, Bangladesh

Responsibilities: Attending on-site training sessions regarding feedstock logistics, plant process, product analysis, and supply management of the petroleum refinery process, gathering first-hand working experience in the largest refinery plant in Bangladesh.

Projects

Postdoctoral Fellow

Jan 2025 - Present

College of Forestry, Wildlife and Environment, Auburn University | Auburn, Alabama, USA

Research Projects

- Development of biobased composites using wood flour, bio-oil, and commercial phenol-based resin for additive manufacturing
- Fire performance testing and method development for oriented strand board (OSB) and other wood products

Postdoctoral Fellow

Feb 2023 - Dec 2024

Department of Biosystems Engineering, Auburn University | Auburn, Alabama, USA

Research Projects

- Liquefying waste plastic for sustainable fuel and monomer recovery
 - o Comparison of pyrolysis and HTL methods for polyurethane plastic upcycling by monomer recovery
 - o Co-liquefaction of polyethylene and polystyrene plastic with subsequent hydrotreatment for aviation fuel products
- Utilizing a rotary kiln reactor system to produce advanced liquid fuels from forest biomass
 - o Pyrolysis of Pine biomass with low-cost catalysts for improved pyrolysis oil properties
 - o Sequential upgrading of pine-derived pyrolysis oil by hydrotreatment process for transportation fuel
- PFAS treatment by hydrothermal liquefaction and adsorption techniques
 - o Conceptualizing the PFAS destruction by thermochemical conversion technologies
 - o Preparing a standard solution for PFAS quantification in aqueous medium
- Developing and operating the 1500 ml continuous hydrothermal reactor system for scaling up the HTL process

Collaboration Research Projects

- o Co-liquefaction of polystyrene and pine biomass to formulate aviation fuel range compounds
- o Characterization of commercially available biochar products to evaluate the result variation and to establish a standard method
- o Exploring glycerol as an in-situ hydrogen donor in catalytic deoxygenation of palm oil to synthesize

- conventional fuels
- Investigation of the hydrogen donor capability of ethanol on waste cooking oil hydrotreatment for renewable diesel
- Effect of reaction solvent, temperature, reaction holding time, and catalyst amount on HTL of food waste
- Selective production of phenolic monomer via catalytic depolymerization of lignin
- Phosphorus adsorption using chemical and metal chloride activated pyrolysis biochar

Research Associate

Jan 2025-Feb 2025

Department of Biosystems Engineering, Auburn University | Auburn, Alabama, USA

Research Projects

- Producing and characterizing pyrolysis-derived biochar from pine biomass by a rotary kiln reactor set up
- Analyzing the data to evaluate the biochar efficiency for greenhouse gas mitigation and soil carbon stabilization

Graduate Research Assistant

Aug 2018 - Dec 2022

Department of Biosystems Engineering, Auburn University | Auburn, Alabama, USA

Research Projects

Doctoral Dissertation: Biocrude production from biomass and mixed plastics via hydrothermal liquefaction (HTL) for fuel and chemicals

- HTL of municipal sewage sludge under ethylene gas with red mud catalyst to enhance the biocrude yield and properties
- Exploring the effect of reactive gases on HTL of algal feedstock by nickel on red mud support catalyst for improved oil
- Depolymerization of simulated plastic waste via reduced red mud catalyst-assisted HTL for lighter hydrocarbon synthesis.
- Investigating the influence of ethanol co-solvent and metallic iron catalyst over HTL of pine with downstream processing

Collaboration Research Projects

- Hydrotreatment study by biochar-assisted catalyst for only carinata oil or a mix of carinata and HTL/ pyrolysis oil, poultry fat
- Bio lubricant synthesis by hydrotreatment of HTL biocrudes, poultry fat, and carinata oil
- The influence of extraction solvents on hydrotreatment of municipal sewage sludge-derived HTL biocrude
- Sorption and recovery of phenolic compounds from the aqueous phase of sewage sludge HTL using pyrolysis biochar

Intern

Apr 2017 - Mar 2018

Eco-friendly Energy & Environment Research Division, Korea Institute of Machinery & Materials | Daejeon, Republic of Korea

Research Projects

- Optimization of energy crops (*Miscanthus*) liquefaction by fast pyrolysis technique in a bubbling fluidized bed reactor
- Studying known acidic solutions by the FTIR technique to determine the organic acid content of biofuel

Research Assistant / Trainee

Mar 2015 - Feb 2017

Korea Institute of Machinery and Materials, University of Science and Technology | Daejeon, Republic of Korea

Research Project

Master's Thesis: Production and the Properties Analysis of Biocrude-oil by Fast Pyrolysis from Palm Kernel Shell (PKS)

- Exploring the effect of reaction temperature on fast pyrolysis of coffee residue in tilted slide pyrolysis pilot scale unit
- Optimizing pyrolysis bio-oil yield of palm kernel shell in bubbling fluidized reactor by varying temperature and particle size

Undergraduate Student

Jan 2011-Dec 2011

Department of Mechanical Engineering, Military Institute of Science and Technology (MIST), Bangladesh

Undergraduate Thesis: Design and Manufacturing of a Pedal-Powered Generator

- Developing a pedal-powered generator by coupling an automobile alternator with the rear wheel of a bicycle structure
- Investigating the performance of the pedal-powered generator by output measurement with varying pedal speed

Teaching Experience

Teaching Assistant/Back-Up Instructor

Jan 2025-May 2025

College of Forestry, Wildlife and Environment, Auburn University | Auburn, Alabama, USA

Course Title: BIOP 5800/ 6800 - Biopolymers for Biomaterials and Packaging

Responsibilities: Grading assignments, assisting in experimental activities with plastic film preparation.

Teaching Assistant/ Guest Lecturer

Jan 2023- Dec 2024

Department of Biosystems Engineering, Auburn University | Auburn, Alabama, USA

Course Title: BSEN 5540 / 6540 - Biomass and Biofuels Engineering (Fall 2023 & 2024)

Responsibility: Serving as a Guest Lecturer to cover the classroom lectures on thermochemical conversion technologies, such as pyrolysis, hydrothermal liquefaction, and gasification; various reactor setups that are currently in use at Auburn University's Center for Bioenergy and Bioproducts; and upgrading treatment of biocrudes, such as hydrotreatment, steam reforming, and catalytic cracking.

Course Title: BSEN 2240 - Biological and Bioenvironmental Heat and Mass Transfer (Spring 2023 & 2024)

Responsibilities: Grading student assignments and test papers.

Lecturer

Sept 2012-Dec 2014

Textile Engineering Department, The People's University of Bangladesh | Dhaka, Bangladesh

Course Titles: Engineering Materials, Machine Technology and Maintenance of Textile Machinery, Elements of Mechanical Engineering, and Workshop Practice.

Responsibilities: Developing class lectures, assignments, and exam questionnaires. Assessing the students' performances.

Publications

1. Hongloi, N., Jahromi, H., Rahman, T., & Adhikari, S. (2025). Pyrolysis oil upgrading via hydrotreatment to produce alternative fuel using ZrO₂-supported catalysts and isopropanol as a solvent. *Journal of Analytical and Applied Pyrolysis*, 192, 107293. <https://doi.org/10.1016/j.jaap.2025.107293>.
2. Wongsurakul, P., **Rahman, T.**, Hongloi, N., Feyzbar-Khalkhali-Nejad, F., Aransiola, E., Bargiela, P., Zhang, L., Ammar, M., Baltrusaitis, J., Kiatkittipong, W., Assabumrungrat, S., & Adhikari, S. (2025). Renewable diesel and bio-aromatics production from waste cooking oil using ethanol as a hydrogen donor in the deoxygenation reaction. *Chemical Engineering Journal*, 509, 161170. <https://doi.org/10.1016/j.cej.2025.161170>
3. Hongloi, N., **Rahman, T.**, Feyzbar-Khalkhali-Nejad, F., Prapainainar, C., Wongsurakul, P., Aransiola, E., Zhang, L., Bargiela, P., Baltrusaitis, J., Prapainainar, P., & Adhikari, S. (2025). Palm oil deoxygenation with glycerol as a hydrogen donor for renewable fuel production using nickel-molybdenum catalysts: The effect of support. *Fuel Processing Technology*, 270, 108196. <https://doi.org/10.1016/j.fuproc.2025.108196>
4. Bansode, A., **Rahman, T.**, Carias, L., Asafu-Adjaye, O., Adhikari, S., Via, B. K., Farag, R., & Auad, M. L. (2025). Hydrothermal liquefied bio-oil from municipal sewage sludge as a reactive filler in polymeric diphenylmethane diisocyanate (p-MDI) wood adhesives. *Sustainability*, 17(3), 1318. <https://doi.org/10.3390/su17031318>

5. Kemp, A., **Rahman, T.**, Jahromi, H., & Adhikari, S. (2024). Production of aviation fuel-range hydrocarbons through catalytic co-pyrolysis of polystyrene and southern pine. *Catalysts*, 14(11), 806. <https://doi.org/10.3390/catal14110806>
6. Hongloi, N., **Rahman, T.**, Biswas, B., Feyzbar-Khalkhali-Nejad, F., Prapainainar, C., Wongsurakul, P., Ivanchenko, P., Jaisi, D. P., Aransiola, E., Zhang, L., Ammar, M., Baltrusaitis, J., Prapainainar, P., & Adhikari, S. (2024). Biofuel production from palm oil deoxygenation using nickel-molybdenum on zirconia catalyst using glycerol as a hydrogen donor. *Energy Conversion and Management*: X, 24, 100781. <https://doi.org/10.1016/j.ecmx.2024.100781>
7. **Rahman, T.**, Jahromi, H., Roy, P., Biswas, B., & Adhikari, S. (2024). Hydrothermal liquefaction of southern yellow pine with downstream processing for improved fuel-grade chemicals production. *Energy Conversion and Management*: X, 24, 100735. <https://doi.org/10.1016/j.ecmx.2024.100735>
8. Hartmann, D., **Rahman, T.**, Carias, L., Auad, M. L., & Adhikari, S. (2024). Upcycling polyurethane plastics via thermochemical conversion pathways: A comparison of hydrothermal liquefaction and pyrolysis processes. *ACS Sustainable Chemistry & Engineering*. <https://doi.org/10.1021/acssuschemeng.4c05202>
9. Biswas, B., **Rahman, T.**, & Adhikari, S. (2024). Mono-and bi-metal catalytic hydrothermal liquefaction of food waste: Screening the process parameters on product yield and characterizations. *Journal of Cleaner Production*, 471, 143398. <https://doi.org/10.1016/j.jclepro.2024.143398>
10. Sapkota, S., Ghimire, R., Bista, P., Hartmann, D., **Rahman, T.**, & Adhikari, S. (2024). Greenhouse gas mitigation and soil carbon stabilization potential of forest biochar varied with biochar type and characteristics. *Science of The Total Environment*, 931, 172942. <https://doi.org/10.1016/j.scitotenv.2024.172942>
11. Biswas, B., Sakhakarmy, M., **Rahman, T.**, Jahromi, H., Adhikari, S., Krishna, B. B., Bhaskar, T., Baltrusaitis, J., Eisa, M., Taghavi Kouzehkanan, S. M., & Oh, T.-S. (2024). Selective production of phenolic monomer via catalytic depolymerization of lignin over cobalt-nickel-zirconium dioxide catalyst. *Bioresource Technology*, 398, 130517. <https://doi.org/10.1016/j.biortech.2024.130517>
12. Biswas, B., **Rahman, T.**, Sakhakarmy, M., Jahromi, H., Eisa, M., Baltrusaitis, J., Lamba, J., Torbert, A., & Adhikari, S. (2023). Phosphorus adsorption using chemically and metal chloride-activated biochars: Isotherms, kinetics, and mechanism study. *Heliyon*, 9(9), e19830. <https://doi.org/10.1016/j.heliyon.2023.e19830>
13. **Rahman, T.**, Jahromi, H., Roy, P., Bhattarai, A., Ammar, M., Baltrusaitis, J., & Adhikari, S. (2023). Depolymerization of household plastic waste via catalytic hydrothermal liquefaction. *Energy & Fuels*, 37(17), 13202–13217. <https://doi.org/10.1021/acs.energyfuels.3c01706>
14. Roy, P., Jahromi, H., **Rahman, T.**, Baltrusaitis, J., Hassan, E. B., Torbert, A., & Adhikari, S. (2023). Hydrotreatment of pyrolysis bio-oil with non-edible carinata oil and poultry fat for producing transportation fuels. *Fuel Processing Technology*, 245, 107753. <https://doi.org/10.1016/j.fuproc.2023.107753>
15. Roy, P., **Rahman, T.**, Jackson, R. L., Jahromi, H., & Adhikari, S. (2023). Hydrocarbon biolubricants from hydrotreated renewable and waste-derived liquid intermediates. *Journal of Cleaner Production*, 409, 137120. <https://doi.org/10.1016/j.jclepro.2023.137120>
16. **Rahman, T.**, Jahromi, H., Roy, P., Adhikari, S., Feyzbar-Khalkhali-Nejad, F., Oh, T.-S., Wang, Q., & Higgins, B. T. (2023). Influence of red mud catalyst and reaction atmosphere on hydrothermal liquefaction of algae. *Energies*, 16(1), 491. <https://doi.org/10.3390/en16010491>
17. Roy, P., Jahromi, H., **Rahman, T.**, Adhikari, S., & Oh, T.-S. (2022). Understanding the effects of feedstock blending and catalyst support on hydrotreatment of algae HTL biocrude with non-edible vegetable oil. *Energy Conversion and Management*, 268, 115998. <https://doi.org/10.1016/j.enconman.2022.115998>

18. Jahromi, H., **Rahman, T.**, Roy, P., & Adhikari, S. (2022). Hydrotreatment of solvent-extracted biocrude from hydrothermal liquefaction of municipal sewage sludge. *Energy Conversion and Management*, 263, 115719. <https://doi.org/10.1016/j.enconman.2022.115719>
19. Roy, P., Jahromi, H., Adhikari, S., Finfrook, Y. Z., **Rahman, T.**, Ahmadi, Z., Mahjouri-Samani, M., Feyzbar-Khalkhali-Nejad, F., & Oh, T.-S. (2022). Performance of biochar-assisted catalysts during hydroprocessing of non-edible vegetable oil: Effect of transition metal source on catalytic activity. *Energy Conversion and Management*, 252, 115131. <https://doi.org/10.1016/j.enconman.2021.115131>
20. Wang, P., Tyndall, S., **Rahman, T.**, Roy, P., Jahromi, H., Adhikari, S., & Boersma, M. (2022). Sorption and recovery of phenolic compounds from the aqueous phase of sewage sludge hydrothermal liquefaction using bio-char. *Chemosphere*, 287, 131934. <https://doi.org/10.1016/j.chemosphere.2021.131934>
21. **Rahman, T.**, Jahromi, H., Roy, P., Adhikari, S., Hassani, E., & Oh, T.-S. (2021). Hydrothermal liquefaction of municipal sewage sludge: Effect of red mud catalyst in ethylene and inert ambiances. *Energy Conversion and Management*, 245, 114615. <https://doi.org/10.1016/j.enconman.2021.114615>
22. Choi, S. K., Choi, Y. S., Han, S. Y., Kim, S. J., **Rahman, T.**, Jeong, Y. W., Nguyen, Q. V., & Cha, Y. R. (2019). Bio-crude oil production from a new genotype of *Miscanthus sacchariflorus* Geodae-Uksae 1. *Renewable Energy*, 144, 153–158. <https://doi.org/10.1016/j.renene.2018.07.043>
23. Han, S., Choi, Y. S., Choi, S. K., Kim, S. J., & **Rahman, T.** (2017). Production of bio-crude oil from palm kernel shell by pyrolysis with a bubbling fluidized bed reactor and the characteristics of the biocrude oil. *Journal of Korea Society of Waste Management*, 34, 853–860. <https://doi.org/10.9786/kswm.2017.34.8.853>
24. Choi, Y. S., Choi, S. K., Kim, S. J., Jeong, Y. W., Soysa, R., & **Rahman, T.** (2017). Fast pyrolysis of coffee grounds in a tilted-slide reactor and characteristics of biocrude oil. *Environmental Progress & Sustainable Energy*, 36, 655–661. <https://doi.org/10.1002/ep.12585>

Invention disclosure

Adhikari, S., Jahromi, H., Roy, P., & **Rahman, T.** (2021). Engineered biochar for ammonia capture from animal facilities (Invention Disclosure No. 2021-071). Auburn University.

Conference presentations

1. **Rahman, T.**, Jahromi, H., Bhattarai, A., & Adhikari, S. (2024, October 27–31). *Sustainable fuel production from plastic waste: Liquefaction of high-density polyethylene and polystyrene*. 2024 AIChE Annual Meeting, San Diego, CA.
2. **Rahman, T.**, Jahromi, H., Roy, P., Biswas, B., & Adhikari, S. (2024, July 28–31). *Hydrothermal liquefaction of southern yellow pine with downstream processing for improved fuel-grade chemicals production*. ASABE 2024 Annual International Meeting, Anaheim, CA.
3. **Rahman, T.**, Jahromi, H., Roy, P., Bhattarai, A., & Adhikari, S. (2023, July 9–12). *Depolymerization of household plastic waste via catalytic hydrothermal liquefaction*. ASABE 2023 Annual International Meeting, Omaha, NE.
4. **Rahman, T.**, Jahromi, H., Roy, P., Adhikari, S., Wang, Q., & Higgins, B. T. (2022, July 17–20). *Influence of red mud catalyst and reaction atmosphere on hydrothermal liquefaction of algae*. ASABE 2022 Annual International Meeting, Houston, TX.
5. **Rahman, T.**, Jahromi, H., Roy, P., & Adhikari, S. (2021, July 12–16). *Effect of catalyst and ambience on hydrothermal liquefaction of municipal sludge*. ASABE 2021 Annual International Meeting (Virtual & On-Demand).
6. Soneye, T. D., **Rahman, T.**, Jahromi, H., & Adhikari, S. (2020, October 5–7). *Production of renewable fuels from hydrothermal liquefaction of municipal sewage sludge, followed by hydrotreatment*. 2020 Thermal & Catalytic Sciences Virtual Symposium.

7. **Rahman, T.**, Choi, Y. S., Choi, S. K., Han, S. Y., & Kim, S. J. (2016, November 2–4). *Analysis of the acetic acid concentration of palm kernel shell biocrude oil by the FTIR method*. 2016 Annual Fall Meeting of the Korean Society for New and Renewable Energy, Gwangju, Republic of Korea.
8. **Rahman, T.**, Choi, Y. S., Choi, S. K., Han, S. Y., & Kim, S. J. (2016, October 12–14). *Influence of reaction temperature and feed size on biocrude oil from fast pyrolysis of palm kernel shell*. 6th International Conference on Environment and Bioscience (ICEBS2016), Incheon, Republic of Korea.
9. **Rahman, T.**, Choi, Y. S., Choi, S. K., Han, S. Y., & Kim, S. J. (2016, May 23–25). *Production and analysis of the characteristics of biocrude oil from palm kernel shell by fast pyrolysis*. 2016 Annual Spring Meeting of the Korean Society for New and Renewable Energy, Jeju, Republic of Korea.

Poster presentation

1. **Rahman, T.**, & Adhikari, S. (2024, October 27–31). *Hydrothermal liquefaction of biomass and mixed plastics for fuel and chemicals* [Poster presentation]. Meet the Faculty and Post-Doc Candidates Poster Session, AIChE Annual Meeting, San Diego, CA, USA.
2. Hartmann, D., **Rahman, T.**, Adhikari, S., Quartermann, Q., Auad, M., & Carias, L. (2023, October 12). *Upcycling of linear polyurethane plastic via thermal decomposition into usable building blocks for existing market infrastructure* [Poster presentation]. Fall 2023 Graduate Engineering Research Showcase, Council of Engineering Graduate Students, Samuel Ginn College of Engineering, Auburn University, Auburn, AL, USA. (**Award Winner**)
3. **Rahman, T.**, Jahromi, H., Roy, P., Bhattarai, A., & Adhikari, S. (2022, October 20). *Valorization of plastic waste by catalytic hydrothermal liquefaction* [Poster presentation]. 2022 Graduate Student Research Poster Showcase, Council of Engineering Graduate Students, Samuel Ginn College of Engineering, Auburn University, Auburn, AL, USA.
4. **Rahman, T.**, Sakhakarmy, M., & Adhikari, S. (2022, May 10–12). *Depolymerization of biomass by hydrothermal liquefaction process* [Poster presentation]. Printimber 2022 Annual Meeting, University of Idaho, Moscow, ID, USA.
5. **Rahman, T.**, Jahromi, H., & Adhikari, S. (2020, October 29). *Effect of red mud catalyst on hydrothermal liquefaction of municipal sludge* [Poster presentation]. 2020 Graduate Student Research Poster Showcase, College of Agriculture, Auburn University, Auburn, AL, USA (Virtual Event).
6. Choi, S. K., Choi, Y. S., Kim, S. J., Jeong, Y. W., Soysa, R., & **Rahman, T.** (2015, November 2–5). *Fast pyrolysis of coffee grounds to produce biocrude oil in a tilted-slide reactor* [Poster presentation]. tcbiomass 2015 - The International Conference on Thermochemical Conversion Science, The Westin Chicago River North, Chicago, IL, USA.

References

1. Name: Maria Soledad Peresin
Title: Professor of Forest Biomaterials
Affiliation: College of Forestry, Wildlife, and Environment, Auburn University
Email: soledad.peresin@auburn.edu
Phone: 334 844 8829
Relation to Applicant: Professor Peresin is the current postdoctoral supervisor of Dr. Rahman, and they are collaborating to develop research grants on the topic of biobased materials.
2. Name: Sushil Adhikari
Title: Professor, Director of Center for Bioenergy and Bioproducts
Affiliation: Department of Biosystems Engineering, Auburn University
Email: sza0016@auburn.edu
Phone: 334 844 3543
Relation: Professor Adhikari has served as Tawsif Rahman's doctoral and postdoctoral advisor. He has supervised Dr. Rahman for numerous research and industrial projects.

3. Name: Hossein Jahromi
Title: Assistant Professor
Affiliation: Department of Biosystems Engineering, Auburn University
Email: hzi0048@auburn.edu
Phone: 334 844 1034
Relation: Dr. Jahromi has played a significant role in the applicant's professional growth, mentoring him during his postdoctoral appointment at the Department of Biosystems Engineering, Auburn University. After his promotion to tenure-track faculty, Professor Jahromi continued to guide Dr. Rahman in proposal writing.

Volunteer Activities

Station Leader

Jan 2025 - Apr 2025

Rallying for Sustainable Communities

In this event, our "green energy" station showed the potential of green technologies to K-6 students using educational toys. The demonstration included solar-powered toy cars and insects, a toy hydro turbine, geothermal energy, and biomass energy.

Volunteer Judge

Apr 2023 - Apr 2025

Alabama Science and Engineering Fair (ASEF)

Apr 2024 and 2025 - Senior division (grades 9-12), Category: Energy sponsored by the College of Sciences and Mathematics of Auburn University.

Apr 2023 - Senior division (grades 9-12), Category – Earth and Environmental Sciences & Environmental Engineering.

Volunteer Judge

Oct 2023 - Mar 2025

Annual Graduate Engineering Research Showcase (GERS)- Auburn University

Served as a judge to evaluate the posters presented by graduate students from different engineering disciplines of Auburn University.

Volunteer Judge

Oct 2024

Undergraduate Student Poster Competition - AIChE 2024, San Diego, CA, USA

Assessed a wide range of innovative research presentations showcased as posters at the prominent AIChE 2024 conference.

Languages

Bengali (Fluent), English (Fluent), Arabic (Beginner), Korean (Beginner), Hindi (Beginner).

Awards

Commandant's List, 2010

Military Institute of Science and Technology (MIST)

Acclamation for securing an average GPA of 3.87/4.00 in the academic session of 2009-2010

Dean's List, 2009

Military Institute of Science and Technology (MIST)

Acclamation for securing average GPA 3.736/4.00 in academic session of 2008-2009

Additional Information

- Work Authorization: Authorized to work in the US for any employer.
- Driver's License: Valid driving license.
- Start Date: Available to start immediately.
- Relocation: Open to relocation nationwide.
- Professional association: American Society of Biological and Agricultural Engineers (ASABE) and American Institute of Chemical Engineers (AIChE).