

Tawsif Rahman (Ph.D.)

Post-doctoral Fellow

College of Forestry, Wildlife and Environment, Auburn University

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LinkedIn



EDUCATION

Ph.D. in Biosystems Engineering (2018-2022)

Auburn University, Alabama, USA

M.Eng. in Environment & Energy Mechanical Engineering (2015 -2017)

Campus: Korea Institute of Machinery and Materials (KIMM)

The University of Science & Technology (UST), Daejeon, Republic of Korea

B. Sc. in Mechanical Engineering (2008 -2012)

Campus: Military Institute of Science and Technology (MIST)

Bangladesh University of Professionals (BUP), Dhaka, Bangladesh

PROFESSIONAL EXPERIENCE

01/2025-Present **Postdoctoral Fellow, College of Forestry, Wildlife and Environment, Auburn University, USA**

Responsibility: Maintaining collaboration between research groups, developing standard methods for biomaterial performance testing, mentoring graduate students, and oversee laboratory maintenance.

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

Teaching Experience

Teaching Assistant/Back-Up Instructor – “BIOP 5800/ 6800 - Biopolymers for Biomaterials and Packaging” (Spring 2025)

Acquired Skills: Preparation of bio-based phenol-resorcinol-formaldehyde (PRF) resin, operation of Masuko's Supermasscolloider series of friction grinding machine, synthesis of bioplastic films via solvent casting procedures.

02/2023-12/2024 **Postdoctoral Fellow, Department of Biosystems Engineering, Auburn University, USA**

Responsibility: Laboratory management-maintenance; mentoring students; maintaining collaboration with different research groups; assisting research proposal writing, preparing scientific articles; attending academic conferences

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 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 standard solution for PFAS quantification in aqueous medium
- Developing and operating the 2-liter continuous hydrothermal reactor system for scaling up HTL process

Collaboration Research Projects

- Co-liquefaction of polystyrene and pine biomass to formulate aviation fuel range compounds
- Characterization of commercially available biochar products to evaluate the result variation and to establish standard method
- Exploring glycerol as 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 over HTL of food waste
- Selective production of phenolic monomer via catalytic depolymerization of lignin
- Phosphorus adsorption using chemical and metal chloride activated pyrolysis biochar

Teaching Experience

Guest Lecturer – “BSEN 5540 / 6540 - Biomass and Biofuels Engineering” (Fall 2023 & 2024)

Teaching Assistant - “BSEN 2240 - Biological and Bioenvironmental Heat and Mass Transfer” (Spring 2023 & 2024)

Mentorship Experience: Dale Hartmann, Ph.D. student (Spring 2023- Fall 2024); Noor Fatima, Ph.D. student (Summer 2023-Fall 2024); Quenton Quartermann, Research Experience for Undergraduates (REU), Summer 2023

Acquired Skills: Cross Functional Coordination · Compliance Management · Rotary Kiln Reactor System · Continuous HTL system · Waste based catalyst · ICP-OES technique for metal analysis · Biofuel Upgrading: Hydrotreatment · Software: Ansys

01/2023-02/2023 Research Associate, Department of Biosystems Engineering, Auburn University, USA

Responsibility: Conducting experimental research, data analysis, maintaining research collaboration, preparing scholarly articles

Research Project

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

08/2018-12/2022 Graduate Research Assistant, Department of Biosystems Engineering, Auburn University, USA

Responsibility: 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, operation and troubleshooting laboratory instruments, presenting research in academic conferences

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 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 aqueous phase of sewage sludge HTL using pyrolysis biochar

Mentorship Experience: Reagan Hurla, Research Experience for Undergraduates (REU), Summer 2022

Acquired Skills: Thermochemical conversion - Hydrothermal Liquefaction, Pyrolysis · Catalyst Characterization - SEM & EDS · Biofuel Characterization - Nuclear Magnetic Resonance (NMR), GC-MS, Elemental Analysis · Feedstock Characterization - Determination of Structural Carbohydrates and Lignin in Biomass, Ultimate-Proximate Analysis · Wastewater characterization - TOC, TN and COD Analysis · Statistical Analysis Software – R & SAS · Modeling Software: SuperPro.

04/2017-03/2018 Intern, Department of Clean Fuel & Power Generation, Korea Institute of Machinery & Materials, The Republic of Korea

Responsibility: Operating Bubbling fluidized bed reactor, liquefaction product analysis, data analysis.

Research Projects

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

Acquired Skills: Biomass pre-treatment · Aging Test of Biofuel.

03/2015-02/2017 Research Assistant / Trainee, Korea Institute of Machinery & Materials, University of Science and Technology, The Republic of Korea

Responsibility: 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, participating in Korean government funded projects by characterizing municipal solid waste materials from commercial entities for quality measurement.

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 over 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

Mentorship Experience: Quynh Van Nguyen, MS student (Spring 2016-Spring 2018)

Acquired Skills: Experimental Design · Laboratory Management · Research Ethics · Biomass Liquefaction Technique: Fast Pyrolysis · Biofuel Characterization: Fourier, transform infrared (FTIR) spectroscopic analysis, Karl-Fischer Titration, Thermogravimetric Analysis (TGA), Bomb Calorimeter, Viscometer · Data Analysis

09/2012-12/2014 Lecturer, Textile Engineering Department, The People's University of Bangladesh, Dhaka, Bangladesh

Responsibility: Preparing lessons, curriculum implementation, teaching undergraduate level engineering courses, grading assignments, preparing exam questions, grading exam scripts

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

11/2010-12/2010 Industrial Trainee, Eastern Refinery Limited, Chattogram, Bangladesh

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

02/2011-12/2011 Undergraduate Student, Department of Mechanical Engineering, Bangladesh University of Professionals, Bangladesh

Prominent Coursework: Basic Thermodynamics, Numerical Analysis, Conduction & Radiation Heat Transfer, Convection, Boiling, Condensation and Mass Transfer, Fluid Mechanics, Production Process, Internal Combustion

Engine, Power Plant Engineering, Machine Design, Engineering Mechanics, Solid Mechanics, Metallic Materials, Mechanics of Machinery, Mechanical Engineering Drawing, Industrial Management.

Undergraduate Thesis: Design and Manufacturing of a Pedal Powered Generator

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

Acquired Skills: Microsoft PowerPoint · Design and Analysis · Critical Thinking · Microsoft Excel · C · Data Analysis · Microsoft Word · Renewable Energy · Teamwork

REFEREED PUBLICATIONS

Google Scholar: <https://scholar-google-com.spot.lib.auburn.edu/citations?user=tk4LYQ4AAAAJ&hl=en>

1. 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>
2. 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>
3. 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>
4. 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>
5. **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>
6. 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>
7. Biswas, B., **Rahman, T.**, & Adhikari, S. (2024). Mono-and bi-metal catalytic hydrothermal liquefaction of food waste: Screening the process parameter on product yield and characterizations. *Journal of Cleaner Production*, 471, 143398. <https://doi.org/10.1016/j.jclepro.2024.143398>
8. 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>
9. 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>
10. Biswas, B., **Rahman, T.**, Sakhakarmy, M., Jahromi, H., Eisa, M., Baltrusaitis, J., Lamba, J., Torbert, A., & Adhikari, S. (2023). Phosphorus adsorption using chemical and metal chloride activated biochars: Isotherms, kinetics and mechanism study. *Heliyon*, 9(9), e19830. <https://doi.org/10.1016/j.heliyon.2023.e19830>
 11. **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>
 12. 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>
 13. 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>
 14. **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>
 15. 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>
 16. 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>
 17. Roy, P., Jahromi, H., Adhikari, S., Finfrook, Y. Z., **Rahman, T.**, Ahmadi, Z., Mahjour-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>
 18. Wang, P., Tyndall, S., **Rahman, T.**, Roy, P., Jahromi, H., Adhikari, S., & Boersma, M. (2022). Sorption and recovery of phenolic compounds from aqueous phase of sewage sludge hydrothermal liquefaction using bio-char. *Chemosphere*, 287, 131934. <https://doi.org/10.1016/j.chemosphere.2021.131934>
 19. **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>
 20. 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>
 21. 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>

22. Choi, Y. S., Choi, S. K., Kim, S. J., Jeong, Y. W., Soysa, R., & **Rahman, T.** (2017). Fast pyrolysis of coffee ground 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 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., Quarterman, 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 ground 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.

HONORS & AWARDS

Commandant's List, 2010	Acclamation for securing average GPA 3.87/4.00 in academic session of 2009-2010 at Military Institute of Science and Technology (MIST), Dhaka, Bangladesh
Dean's List, 2009	Acclamation for securing average GPA 3.736/4.00 in academic session of 2008-2009 at Military Institute of Science and Technology, Dhaka, Bangladesh

PROFESSIONAL ASSOCIATION

June 2021 – Present: Member of American Society of Biological and Agricultural Engineers (ASABE)

March 2024 – Present: Member of American Institute of Chemical Engineers (AIChE)

ACADEMIC & COMMUNITY SERVICE

Manuscript Peer Review

Elsevier: Fuel, Bioresource Technology, Bioresource Technology Report, Chemosphere, Cleaner Waste System, Journal of Analytical and Applied Pyrolysis, Waste Management, Journal of Cleaner Production, Chemical Engineering Journal

American Chemical Society: Energy & Fuels

Springer: Energy, Ecology and Environment, BioEnergy Research

Outreach Activities

November 12-13, 2024	Volunteer Judge in Engineering Orientation (ENGR 1100) Shark Tank Projects, Auburn University
October 28,2024	Volunteer Judge in Undergraduate Student Poster Competition October 28,2024, AIChE 2024, San Diego, CA, USA
October 24,2024	Volunteer Judge in Graduate Research Poster Showcase, College of Agriculture, Auburn University
April 13, 2024	Volunteer Judge in Alabama State Science and Engineering Fair (ASEF), Auburn University
October 12, 2023	Volunteer Judge in Graduate Engineering Research Showcase, Auburn University
April 1, 2023	Volunteer Judge in Alabama State Science and Engineering Fair (ASEF), Auburn University
March 28, 2023	Volunteer Judge in Auburn's 2023 Student Research Symposium, Auburn University
October 08-10, 2018	Volunteering in Thermal and Catalytic Sciences Symposium (TCS)2018, Auburn University
January - March 2017	Volunteer in Carbon Art Project, Korea Research Institute of Chemical Technology (KRICT), Daejeon, Republic of Korea
November 2015	Volunteer in coals supplying to underprivileged area of Daejeon city, Republic of Korea

References will be furnished upon request.